Orthognathic Surgery In Cleft Lip –Palate Patients

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The reported need for orthognathic surgery in patients with unilateral cleft deformities is estimated to be around 25 %. It has been shown that orthognathic surgery and orthodontic treatment improve facial symmetry and appearance as well as align the palatal arch and alveolus for better occlusion. A team approach with good orthodontist is required to provide good results. We present a series of 12 cleft patients from 2012 to 2016 who have undergone orthodontic treatment followed by orthognathic surgeries.

Materials and methods: a retrospective chart review of patients who underwent orthognathic surgery from 2012 to 2016 was done. The type of cleft and the previous surgeries were noted. The initial cephalometric analysis, the orthodontic treatment given, the type of orthognathic surgery performed and the amount of correction achieved in terms of millimetres of advancement as well as patient satisfaction with their appearance and occlusion were analysed. The choice of surgical procedure was based on the amount of advancement of maxilla needed and the amount of relative mandibular prognathism.
Results: among the 12 patients, 7 were men and 5 women. Patients age ranged between 18 – 21. Among the 12 patients, five underwent anterior maxillary distraction alone, one underwent Le fort 1 maxillary distraction alone, two underwent Le fort 1 advancement alone, two patients underwent BiMax surgery, one patient underwent Le fort 1 advancement followed by sliding genioplasty and one underwent BSSO alone. All patients showed satisfactory facial symmetry with good occlusion and palatal arch.

Conclusion: The final aesthetic appearance of face, the dental alignment and occlusion as well as overall patient satisfaction is improved greatly with orthodontic- orthognathic surgical team approach and it should be aimed for in the population of cleft patients needing it.

Outcomes Of Osteotomy Vs Distraction For Correction Of Maxillary Hypoplasia In Cleft Lip And Palate: A North India Overview

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Purpose: The correction of cleft hypoplasia is always being challenge for cleft surgeons. The hypoplastic maxilla in cleft patients tends to show instability when treated by conventional Lefort I maxillary advancement, as well as relapse, when compared with non cleft patients who have maxillary hypoplasia. Distraction osteogenesis (DO) has become as effective treatment modality, which can provide skeletal advancement and expansion of soft tissue simultaneously.

Methods: Patients were divided into two groups; patients undergoing Classical maxillary LeFort I advancement and Surgically Assisted Rapid Maxillary Expansion for hypoplastic maxilla The total 25 cleft lip and palate patients were selected for study. Pre operative and post operative (six months) cephalogram and periapical radiographs were taken by same operator at the same centre. After cephalometry for orthognathic surgery,
patients were planned for pre surgical orthodontia for decompensation. Reevaluation of patient and planning were finalized before surgical intervention. In Group I, we have used the palatal expansion screw (Leone 11mm Rapid Palatal Expander) for antero-posterior maxillary expansion and in Group II, we have performed the classical Le fort I osteotomy. All subjects were followed minimum period of 1 year.

**Result:** Both the procedures have given the desired result in cleft lip and palate patients with hypoplastic maxilla for both facial appearance and occlusion. The significant soft tissue outcomes (Naso labial angle, soft tissue sub nasal) were achieved along with forward movement of the anterior nasal spine, point A, central incisors and first premolars.

**Conclusion:** A growing patient with mild to moderate maxillary hypoplasia and a narrow upper arch, early correction is possible with maxillary and dental arch lengthening using interdental DO and Osteotomy for the older patients.

A Technical Innovation In Midface Advancement Using External Frame Distraction

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**Objective:** Technical innovation to make midface advancement with external frame distraction device using trans-pyriform traction wire more reliable.

**Background:** One of the commoner complications with Midface Distraction using trans-pyriform wires is the traction wire cutting through the bony buttress during activation. The problem is more acute in patients with cleft midface hypoplasia who very often require this procedure because of soft tissue scarring offering additional resistance.

**Design:** Technical innovation of the surgical procedure.

**Setting:** Cleft and Cranio-facial Center at a University Teaching Hospital.
**Patients:** Cleft patients with midface hypoplasia who underwent Le-Fort I Distraction using RED II distraction device.

**Interventions:** Addition of a single–holed titanium plate as a washer to distribute the load of the threaded stainless-steel wire at the pyriform buttress.

**Main Outcome Measures:** Comparison of the incidence of distraction failure due to the traction wire cutting through the bone buttress in the pyriform region before and after the introduction of the innovation.

**Results:** More reliable distraction using Rigid External Device (RED) II in severely scarred cleft patients by preventing the trans-pyriform wire cut through.

**Conclusion:** A simple technical addition to the surgical procedure for better and safer outcome.

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**Severe Mid Face Hypoplasia - A Case Report**

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An eight year old boy reported with severe mid face hypoplasia to us. The complaints included obstructive sleep apnea, hyper-lacrimation, dish face and anodontia. On clinical examination and radiographic examination the patients complaints were analyzed, a negative overjet approximately 19mm was observed. Considering the age a conservative approach with a face mask connected to a zygomatic implant was advocated. This approach did not yield any positive outcome due to the implant failure.In the view of mid-face deformity being severe and taking into account the list of complaints the decision was made to carry out a LeFort III distraction subsequently when the boy attains 9 years of age. A bi-planar rigid external distractor was used. The maxilla was distracted by 30 mm and the mid-face including the zygomatic eminence, infra orbital rim, nasal bones were distracted by 15mm. After a consolidation period of 3.5 months the distractor was removed.6 months after consolidation the results were
analyzed clinically and radio graphically including 3D CT scan. It was found that the skeletal advancement is stable with no evidence to suggest any significant relapse. In addition, it was found that the obstructive sleep apnea was completely ceased, the hyper-lacrimation markedly reduced.

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**Speech Changes In Patients With Cleft Lip And Palate Following Anterior Maxillary Distraction**

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Maxillary hypoplasia is common sequelae to Cleft Lip and Palate repair. Anterior Maxillary Distraction osteogenesis introduced in 2004 Karakasis & Hadjipetrou has opened a new perspective in treatment of the cleft midface since this allows for correcting the Maxillary retrusion by increasing the dimensions of the maxilla without moving the entire maxillary segment forward.

Though this technique does not affect the velo-pharyngeal space unlike the conventional Le Fort I level osteotomy, there is little published literature on its effects on speech. Since speech is a complex entity with position of the lip, dentition and occlusion playing major roles, this study evaluates the changes in speech in cleft patient following midface correction by Anterior Maxillary Distraction.

25 consecutive patients were evaluated before AMD and again six months following surgery. They were studied in terms of resonance, nasality, understandability and acceptability and cross checked using inter-rater and intra-rater reliability tests.

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**Role Of Anterior Maxillary Segmental Distraction In Adolescents With Cleft Midface Hypoplasia – A Preliminary Report**

Aim: To define the role of Anterior maxillary segmental Distraction (AMD) in adolescents with Cleft midface hypoplasia.

Background: Anterior Maxillary Segmental Distraction (AMD) described by Dmitri Karakasis in the year 2003, has gained rapid popularity for the correction of Cleft Midface Hypoplasia in recent years. The procedure corrects maxillary retrusion and reverse overjet by increasing the size of the maxillary arch by causing new bone formation between the teeth through which the osteotomy passes. This new bone may have an inherent tendency to relapse unless protected by a spacer such as prosthetic tooth, osteo-integrated implant or by orthodontically moving a tooth into the distracted bone. The efficacy of former two methods in a growing child is still unproven. However, for the children in their early teens with crowding of teeth, the additional space created by this technique can be used for accommodating the additional teeth which otherwise may need extraction.

Materials and methods: 10 consecutive patients with a minimum follow-up period of one year operated between 11 and 15 years of age were retrospectively analysed. All were taken up for specific indications viz. significant midface hypoplasia not amenable to orthodontic correction alone, severe crowding of teeth and the child wants to have the procedure done for social reasons without parental persuasion.

Results and Discussion: The results were analysed in terms of the increase in the size and shape of the alveolar arch, alignment of the crowded teeth, ability to move a tooth into the distracted space to fill it, changes in the maxilla-mandibular relationship, speech articulation and subjective social outlook of the child. A systematic review of literature on long term results revealed few authoritative publications with sufficiently significant numbers and long term follow up. This is particularly so if used in patients who do not have crowding of teeth and may need osseointergrated implants which are difficult to maintain when inserted into the distracted bone.

Though any procedure done on a growing face has the risk of recurrence or relapse, our reasoning is that the procedure may delay or minimize the
amount of retrusion by restoring occlusion. Besides this, since the procedure is confined to the Anterior Maxilla, it does not in any way affect another procedure on the maxilla or mandible for definitive correction of the midface skeleton if needed.

Conclusion: Given the present state of evidence regarding the long-term efficacy of this procedure, we confine our indications in children with midface hypoplasia to those already stated. (vide supra) Being a preliminary report, we find that within the constraints of small numbers and short follow up we feel that this paper is essential because there are few publications regarding specific indications for this procedure in adolescence.

Keywords: Anterior Maxillary Segmental Distraction, Indications, Crowding of teeth, Adolescent

Impact Of Technology Infusion In Providing Comprehensive Care To Individuals With Cleft In Rural Areas.

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For over a decade speech and hearing services have been provided for individuals with CLP living remote villages in two districts of Tamilnadu. In this community based project speech and hearing related services were provided with the help of trained Community Based Rehabilitation Workers (CBRW) under the supervision of audiologists and speech pathologists. The penetration of mobile connectivity and internet has increased rapidly in rural India. ICT has enabled infusion of different levels of technology for different types of services (speech, hearing, screening, documentation etc.). This in turn has increased the efficacy of the project. This presentation will discuss the scope, utility and potential benefits of
technology infusion. The learning’s have universal applications across the globe and across different types of disorders in underserved areas.

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**Utilizing Tele Technology For Providing Speech Therapy For Individuals With Cleft From Underserved Areas. : Strengths Weakness Opportunity And Challenge Analysis.**

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There have been several attempts to develop different models of service delivery for individuals in rural areas such as the camp-outreach model and the community based rehabilitation model In the rural community based project providing comprehensive management for communication disorders individuals with CLP using of available technology was identified as option to overcome some of the logistics challenges. The penetration of mobile connectivity has increased rapidly in rural India. With the penetration of telephone and internet within these villages it has become easier to communicate with the local communities, monitor the service delivery, and even provide diagnostic services over the internet or through tele set up. This presentation will highlight on the prerequisite in setting up of this model of service delivery, materials and tools required for tele intervention and the challenges in implementing and sustaining this model of intervention.

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**Cleft Orthodontics – Achieving Optimal Aesthetics & Function**

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[www.newdelhidentist.com][1]  [www.newdelhibraces.com][2]
The complexity of problems associated with children born with cleft lip & palate necessitate a dedicated team of specialists to achieve a functionally optimal & aesthetically acceptable treatment outcome. Of all the specialists involved, it is the orthodontist who is in touch with the patient for prolonged time periods during the rehabilitation of cleft patients. He is also probably the only team member who interacts with all other specialists at some point or the other. The orthodontist’s role in coordinating the interdisciplinary care of cleft patients therefore becomes pivotal. Despite the severity of malocclusion present in such patients, orthodontic treatment can effectively provide a functionally stable & esthetically acceptable dental occlusion. In this presentation, the nuances of orthodontic treatment & biomechanics involved in treating cleft lip & palate patients will be discussed along with detailed presentation of clinical cases treated by the speaker.

Bridging The Gap Between Surgeon And Orthodontist

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It is now well established that a cleft team is required for the proper treatment of children with cleft lip and palate. This team includes surgeons, orthodontist, speech therapist, paedodontist, nutritionist, social worker.

The focus of initial consultations often involving the surgeon and the orthodontist is to provide a clear road map of treatment and to address the immediate need of feeding. The treatment protocol often varies from centre to centre. The major milestones in the treatment protocol are infant presurgical orthopaedics, Dentofacial orthopaedics and orthodontics, SABG, Orthognathic surgery and Rhinoplasty.

Surgical and Orthodontic specialities, with different expertise and expectations will have different point-of-view on management issues. At each stage there are conflicting views on treatment protocol. Infant Presurgical orthopaedics-Effective or not. Dentofacial orthopaedics-Beneficial/ Burden. SABG- pre and post orthodontics-Yes/No.

Conveying a unified treatment plan can minimize conflicts and expedite implementation of interventions. Although ideally the surgeon and the orthodontist should see the child together and device a treatment plan, it is not always possible. An alternate strategy is to develop “Check-list” for different stages of treatment. The check list must be compiled with both the surgeon and orthodontist determining what is required for the treatment at each mile stone. How this can be achieved will be discussed for each major mile stone of treatment. Referring to this check list will enable both the surgeon and the orthodontist to come to a consensus. Communication becomes easier and faster and treatment protocol standardized.

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**Perspectives In The Management Of Paediatric Craniofacial Anomalies**

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**The F Word In Ear Reconstruction**

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**Management Of Patients With Cleft Lip And Palate – The Orthodontist’s Perspective**

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Cleft lip and palate is by far the most commonly occurring anomaly. It is reported to occur in about 1 in 800 children. The cause is multi factorial and the treatment requires a multi disciplinary approach. The orthodontist plays a pivotal role as a team member and is probably the only specialist involved from birth till late adulthood.
The role of orthodontists include neonatal orthopedics including fabrication of feeding plates and NAM, growth modification in the mixed dentition stage to offset the skeletal imbalance, expansion prior to or after alveolar bone grafting and definitive orthodontic therapy including pre/post orthodontics in patients requiring orthognathic surgical intervention. The role of orthodontics and the challenges in each of these stages is highlighted in this presentation.

Prospective Randomised Study On Botulinum Toxin Injection For Cleft Lip Repair And Its Effectiveness In Scar Modulation.

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After surgery, a scar which is oriented perpendicular to relaxed tension skin line gives an unappealing appearance. In cleft lip repair, tension at the suture line caused by orbicularis muscle causes significant scarring and a poor cosmetic result. Thus, giving a patient of cleft lip, an aesthetic scar is a challenge itself, considering the fact the surgery is itself tricky, even in experienced hands. In this prospective randomized study, 28 patients with unilateral cleft lip undergoing primary lip repair were randomized to receive Botox or normal saline into adjacent orbicularis oris muscle immediately after wound closure. Scar was reassessed after 6 months using Visual Analogue Scale, Vancouver Scar Scale, and photographic width measurements. 22 patients were able to complete the follow-up. There was a significant difference in VAS score and scar width, among Botox and control group. However difference in Vancouver scar scale score in between both the groups was not significant. There were no complications associated with the use of Botox in the study population. Hence it can be concluded that Botulinum toxin is a safe and effective addition to improve scar appearance following cleft lip repair.

D Cleft - A Case Series With Innovation

Abstract Presenting Authors : Dr. Aditya Kapoor
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The Cleft palate is caused due to non fusion of palatal shelves at the embryonic stage leading to a huge physical and psychological compromise for the child and trauma for the parents. As dentists, our role in the team treating such patients is facilitating for feeding and maintenance of nutrition until such time that surgeries can be performed. The purpose of our presentation is to present an innovative device used in feeding such patients. We will through these cases explain and depict the stages of development of this innovation from concept to trials.

New borns afflicted with Cleft palate need extra care and patience in feeding. It is not a motivating sight for parents and care-takers to see children being fed using tubes.

Expanding The Horizon In CLP Treatment- Estrogen-Nano Diamond-Hydrogel

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Patient with CLP exhibit failure of fusion of maxillary & nasal processes & suffer from challenges due to restricted maxillary growth. So maxillary expansion is needed to improve speech development, nasal breathing, masticatory function, to facilitate future permanent tooth eruption and enhanced esthetics leading to greater self-esteem. But, due to patient’s congenital lack of bone & reduced capability of bone regeneration at cleft site, stability of expansion gets compromised, leading to relapse. To counter this clinical challenge an innovative treatment strategy has been introduced using an injectable system with photo-cross-linkable MGC (Methacrylated Glycol Chitosan) hydrogel (G) & Nanodiamond (ND) technology to enhance targeted & sustained localized delivery of pro-osteogenic material 17β-Estradiol (E2) which plays critical role in bone homeostasis. One animal study has shown, E2/ND/G complex received animal group exhibited reduced postexpansion relapse 3-fold by promoting mid-palatal sutural remodeling, 2-fold increase in Bone Mineral Density(BMD) & bone volume & 3-fold increase in Osteoblast Number(Ob.N) per Bone Surface Perimeter(B.Pm) compared with control group. Moreover, E2/ND/G system maximizes beneficial effect of E2 through its stable release with superior efficacy & safety at the local level.
So, biocompatibility & uniqueness of E2/ND/G platform may represent a promising future clinical tool for achieving post expansion stability, addressing the pervasive complication in craniofacial medicine.

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**A Comparative Hard Tissue Cephalometric Study Of Nasoalveolar Moulding (NAM) And Non NAM Treated Bilateral Cleft Patients At The Early Mixed Dentition Period.**

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**Objective:** To evaluate and compare the early maxillary growth in two groups of repaired Bilateral cleft lip and palate (BCLP) patients who had and had not received Nasoalveolar Moulding therapy in infancy

**Design:** Retrospective study

**Patients:** Forty two 7 year old BCLP patients - Twenty in the NAM group and Twenty two in the No NAM group. Nineteen 7 year old non-cleft, normal patients in the control group.

**Interventions:** Patients were divided into NAM and No NAM groups based on eligibility. If the child was brought by the age of 8 weeks of birth, NAM was carried out prior to surgery. All the patients who had arrived late were treated without a presurgical intervention. All patients were treated with a single stage modified Millard’s cheiloplasty without Gingivoperiosteoplasty or primary rhinoplasty. Single stage Bardach’s palatoplasty with muscle repositioning was carried out in all patients.

**Null Hypothesis:** NAM causes maxillary growth retardation

**Mean Outcome Measures:** Cephalometric values representing hard tissue and dental structures, measured on lateral cephalograms recorded at 7 years of age.

**Results:** A maxillomandibular retrusion was present in both the cleft groups in comparison to the control group. Both differed from the normal
by approximately 4° at point A and 3° at the ANS. However there was no statistically significant difference between the NAM and No NAM groups. Similarly, the mandible was also retruded by about approximately 3° in both cleft groups in comparison to the control with no statistically significant difference between the NAM and No NAM groups. The maxillary teeth were retroclined in both the NAM and No NAM groups in comparison to the control group. The values of the No NAM fared worse, exhibiting a 13° retroclination more than NAM group. The maxillomandibular relation, lower face height ratio and mandibular plane did not differ significantly from the control group.

**Conclusions:** The current study showed early retrusion in the maxillary and mandibular cephalometric values of both the cleft groups in comparison to control group. However, there was no statistically significant difference between the NAM and No NAM groups across all cephalometric parameters measured. On the basis of this study, NAM does not cause maxillary retraction in bilateral cleft lip and palate patients at the early mixed dentition phase.

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**Three-Dimensional Volumetric Comparison Of Palate In Unilateral Cleft Lip And Palate Using Digital Dental Casts And Correlation With Timing Of Palatal Surgery**

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**Aim:** To compare palatal volume of operated subjects with unilateral cleft lip and palate (UCLP) with Skeletal Class I controls using 3D digital dental casts and correlate the palatal volume with timing of palatal surgery in UCLP.

**Material & Methods:** The study was conducted on 34 UCLP (UG), 12 non-cleft skeletal Class I control (C) study models in the age group of 6-13 years. The study models were scanned with Maestro 3D Scanner at a resolution of 10µm. The gingival plane (plane connecting the midpoints of the dentogingival junction of all teeth) and the distal plane (plane connecting the distal most points of the first permanent molar and perpendicular to the gingival plane) were used as the boundaries. The palatal volume
assessment was done by Mimics software. Based on timing of palatal surgery UCLP was divided into early surgery group (before 18 months, UG1, N=15) and late surgery group (after 18 months, UG2, N=15). The independent t test was used to compare UG and Control groups. Also comparisons were done between UG1 and UG2 using independent t-test.

**Results:** Significant difference was seen between UG and C groups (2491.66±491.66 mm³, P=0.000). The difference between UGI and UG2 was non-significant.

**Conclusion:** This study provides an insight into the patient outcome in respect to palatal growth via palatal volume. Palatal volume of UCLP cases was lower than the control sample demonstrating restricted growth of palate in operated cleft cases. Palatal volumes in both the early versus late palatal repair groups is comparable and hence early palatal surgery can be justified.

**Key words:** Palatal volume, UCLP, BCLP

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**Treatment Modalities To Achieve Nasal Symmetry In Unilateral Cleft Lip/Nasal Deformity: An Objective And Comparative Evaluation**

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**Introduction:**

Outcome of primary chieloplasty is dictated by lip symmetry, nasal symmetry and its effects on the quality of oro-facial function and development. Lip symmetry can be achieved to a large extent but achieving nasal symmetry is a grail for every cleft surgeon. Stigma of cleft is mainly due to residual defect in nose. Cleft nasal deformity is a distinct pathophysiologial deformity of oro-facial cleft that necessarily accompanies it due to the displacement of alar cartilage, abnormal positioning of the columella, nasal septum and the skeletal pattern of the lesser segment². Literature is flooded with various maneuvers to achieve nasal symmetry during pre-operative, intraoperative and post- operative period. However, there is no broad consensus on any of these maneuvers. Naso alveolar
molding (NAM) is an important adjunct and nasal conformer is a useful tool that helps in maintaining nasal symmetry achieved at the time of repair by supporting the nasal alae that collapses during inspiration. Open tip rhinoplasty provides the avenue to physically reposition the displaced lower lateral cartilage in an optimal position. This study aims at objectively evaluating the outcome of various maneuvers to achieve nasal symmetry.

Evaluation And Comparison Of Maxillary Palatal Volume Of The Unilateral Cleft And Palate Cases Treated With And Without Presurgical Naso Alveolar Molding As Compared To The Non Cleft Children.

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Cleft of the lip, alveolus, and palate are the most common congenital malformations trailing clubfoot in incidence that presents a significant health problem with a great challenge to healthcare professionals. It is important to understand the etiology and growth in cleft before planning any treatment strategy. Major concern amongst the unfavorable sequel of the cleft is related with the growth and development of the craniofacial structure. Most commonly affected skeletal tissue of the head neck face region is the maxilla with its counter effects on the cranial base and the mandible.

Cleft requires a long term management from birth to puberty for which there are various protocols advised and followed by many centers across the globe. Amongst all the widely accepted protocols are the Eurocleft and American Cleft. With modification in the basic protocols, various centers treat their cases, but none of the protocol till date has proved itself to be beneficial over other. Shaw W in 1992 compared protocols followed in 6 centers and evaluated their benefits at the end of the treatment.

Over the years numerous treatment modalities have been attempted so as to achieve satisfactory outcome which includes pre-surgical orthopaedics, lip and palate repair techniques, midfacial growth deficiency corrections, fistula closures with bone grafting, surgical revisions and orthognathic
surgeries with severe skeletal discrepancy. In spite of the research, time and effort invested, achieving optimal aesthetics and restoring ideal functions continue to pose a challenge to the concerned professionals.

Initially surgical repair was the only choice. To further improve the aesthetics and functions the concept of presurgical infant orthopedics was developed for the cleft neonates. McNeil in 1959 described the modern concept of presurgical maxillary orthopedics. From McNeil’s concept of alveolar molding to concept of naso-alveolar molding numerous changes in appliance design and concept arrived, amongst which Presurgical Naso-alveolar Molding (PNAM) gained fame worldwide. PNAM (a passive appliance) was introduced by Grayson after Matsuo stated the importance of molding the nasal cartilage. PNAM was basically introduced to reshape the alveolar and nasal segments prior to surgical repair.

Every technique is associated with its pros and cons so does the PNAM technique. Literature has varied data on long term effects of the PNAM technique with positive and negative effect with an unsolved controversy still existing.

The proponents for the PNAM technique claim that, this non-surgical treatment molds the alveolar segments into better arch form, prevent collapse, improves dentomaxillary development and maxillomandibular relationship, and primary surgical repair of nose. Lip seals under minimum tension, reduces the scar formation which reduces the severity of the defect, improves nasal symmetry, nasolabial aesthetics without detrimental effects on mid facial growth and helps in psychological wellbeing of parents. The appliance guides the tongue for normal function thus promoting a guided growth.

According to the opponents, surgery alone can suffice the requirement for facial symmetry while PNAM has constrictive effects on the arch in transverse and sagittal dimensions. It retards the growth of the palatal tissue, and has no long term effect on facial appearance.

The controversy deals around three dimensional alterations in growth of maxilla. The degree of collapse is influenced by genetic, environmental as well as iatrogenic effects of surgical interventions, with an additive effect of PNAM. There are studies that state that; severity of cleft affects the maxillary growth while the initial cleft size have no role to correlate with
the treatment outcome. Therefore, WHO has given specific guidelines to treat the PNAM cases.

Considering the current conflict, an observational cross-sectional post-doctoral research study was planned with an aim to evaluate and compare the maxillary palatal volume of the unilateral cleft cases treated with and without PNAM as compared to the non cleft children.

Language Input Of Mothers In Toddlers With Repaired Cleft Palate Following Early Intervention Program

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Introduction: Extensive research in the past two decades have proven that early intervention (EI) in the areas of speech and language is required soon after the surgery for children with cleft lip and palate (CLP). Few studies have highlighted the role of maternal stimulation in the development of language in children with repaired cleft lip and palate (RCLP).

Objective: The study attempts to provide an insight on the efficacy of speech and language therapy by investigating the different changes in the maternal measures across 30 sessions.

Participants: Ten mother-child dyads were enrolled for the EI program of which the mothers served as the participants of the study.

Method: The baseline was established by measuring maternal measures such as number of total utterances, total words, number of different words, Mean Length of Utterance (MLU) and Type Token Ratio (TTR). Mothers were taught to carry out the focused stimulation technique by speech language pathologists. Speech and language therapy was given for 30 sessions. Periodic audio-video recordings were carried out after 15 sessions to analyze the language parameters and speech behaviors of the mothers across sessions. A total of three recordings were obtained.
**Results:** Time series design was carried out and the results showed that there was a statistically significant difference across sessions in parameters such as total number of utterances, words and different words (*p*≤0.01). However MLU and TTR did not show a statistically significant difference. There was also a statistically significant difference in the mother's behaviors across the sessions (*p*≤0.05). The results revealed that the language stimulation provided to toddlers by the mothers showed significant improvement.

**Conclusions:** The present study highlights the importance of involving mothers in increasing the efficacy of EI program in children with RCLP.

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**Outcome Assessment Of Cleft Palate Repair**

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Assessment of outcomes, particularly in the medium and the long-term are very essential in evaluating efficacy of treatment protocols in any discipline and particularly so in Cleft Palate Deformities. This study will look at both Speech and Growth outcomes in a cohort of 50 patients treated with primary repair of the cleft palate at around 1 year of age at our unit. These patients were in the age range of 5-9 years. Speech was assessed both perceptually as well with instrumentation. Those identified with VPD underwent necessary surgical and adjunctive therapies after which another assessment was carried out. Growth was measured on the casts using the GOSLON, index. The results of all this assessment will be shared in this presentation.

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**Suspension Palatoplasty**

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In treating ‘speaking unrepaired clefts of palate’ (over six years unoperated), all conventional surgical procedures have given inconsistent
results at best. A new operative approach has been tried based on our earlier published work in which we showed that by videofluoroscopic evidence that a resting gap of 6mm or less has a good chance of velopharyngeal closure. In this procedure a modified Furlow (Hybrid as I coined it earlier) is suspended to the roof of nasopharynx at the level of the eustachian orifices (usually at the lower one third of adenoids). A follow-up of 50 patients over one to three years has given spectacular results in majority of patients far surpassing my own expectations especially in terms of 'normal' speech even in adults (19 and above) which I could never achieve in the past despite trying every other method. I would like to present the technical details of the procedure and the results to the ISCLPCA's delegates during cleftcon2018 at Kolkata.

Comparison Between Furlow Versus Buccal Myomucosal Flap In Secondary Cleft Palate Defect-A Randomized Study

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Velopharyngeal dysfunction (VPD) is considered to be a major cause for speech impairment in individuals with repaired cleft palate. Though the augmentation techniques are traditionally favored attempts have been made to establish efficacy of much physiological methods for the treatment of secondary VPD. The present study gives the preliminary results of a prospective randomized study to establish the efficacy of the two surgical techniques in correcting post palatoplasty secondary VPD. The aim of the study was to compare the two surgical techniques Furlow's double opposing Z plasty and Buccal myomucosal flap (BMMF) in treating VPD. The objectives were to evaluate the perceptual speech outcomes and videofluoroscopic findings after both the techniques. 30 Individuals with repaired cleft lip and palate in the age range of 6-25 years were considered as participants for the study. All the individuals with VPD diagnosed through individual speech assessment and lateral view videofluoroscopy
(LVF) were randomly assigned (15 each) for two surgical procedures. Speech parameters considered for analysis were hypernasality, nasal air emission, speech understandability and speech acceptability. Severity of VPD in lateral view videofluoroscopy was interpreted in terms of change in resting gap, velar excursion and closure ratio. Both speech assessment and LVF were repeated 3 months post surgical correction. The results shows that there was significant positive difference in VFS parameter and speech parameters postoperatively in furlow’s palatoplasty while post operative results in individuals undergone BMMF did not show a significant change in most of the parameters. The study shows better results with furlow’s technique than BMMF. The study on larger data will give indication towards parameters to be considered for the selection of appropriate surgical technique.

Cleft VPI: Protocol For A Graded Approach To Management

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Introduction: Velo-pharyngeal dysfunction (VPD) is a common and troublesome complication following cleft palate repair. The first step in the diagnosis and management of clinical VPI in an individual with cleft is to establish the dichotomy between structure and function. Once this is achieved the subsequent steps are to establish the severity of the structural deficit so that surgical restoration can be achieved by a graded approach with the least amount of deviation from normal anatomy and physiology for a mild deformity and more radical one for the severe deformity followed by speech therapy and relearning.

The Graded approach to Surgical correction of structural VPD - Decision making: This can be achieved by clearly establishing the severity of the structural abnormality and choosing a corrective procedure appropriate to this. The patients with were sub classified as minimal, mild,
moderate or severe velopharyngeal insufficiency according to the percentage of closure of the velopharyngeal gap enabling us to choose the operation according to the severity. (see Diagram below) The process of choosing was further refined by taking into consideration several tempering factors such as age, scarring, accessibility to speech therapy etc. to arrive at a decision regarding treatment.

**Fig 1.** Stylised representation of the Velo-pharyngeal sphincter mechanism. The grey shaded area shows the Velo-pharyngeal gap. The indentation below represents the soft palate.

**Evaluation and results:** 100 consecutive patients with operated cleft palate clinically diagnosed by a speech pathologist as having hyper-nasal speech were included in this study. The patients had undergone primary
operation at varying ages at several centres. All underwent nasoendoscopy to evaluate velo-pharyngeal function. The VPD was classified as structural or functional according to their ability to close the velopharyngeal sphincter at will while repeating a standard set of sounds, phrases and sentences.

The VPI was classified as structural or functional according to the ability of the patients to demonstrate closure of the velo-pharyngeal sphincter to one or more phoneme at will. This group underwent only speech therapy. Patients who could demonstrate only partial closure of the velo-pharyngeal sphincter with a residual gap between the knuckle of the soft palate and the posterior pharyngeal wall were further subdivided according to the extent of closure as follows: Patients who could achieve up to 75% closure with a residual gap of < 25% was designated Minimal deficit (0.75), Moderate gap (25-50 %) and Large gap (25-50 %). Corrective surgery was performed according to the severity of the structural problem choosing from a repertoire of procedures ranging from the near physiological to the least physiological in an incremental fashion as follows:

The results were reevaluated subjectively and objectively by trained speech Pathologists not involved with the procedure and cross checked by inter and intra rater reliability tests for speech as well as visualisation of the velopharyngeal closure by nasoendoscopy.

**Conclusion:** Cleft related Velopharyngeal insufficiency is a formidable challenge to the Cleft surgeon and the speech Pathologist. This paper attempts to simplify the diagnosis and approach the treatment according to the severity

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**Management Of Vascular Anomalies In Head And Neck**

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**Abstract:** Vascular anomalies are a complex pathological group. Sixy percent of vascular anomalies are found in the head and neck. These lesions can present throughout antenatal, perinatal and childhood
development. Due to the lack of awareness of the patients and an effective referral system, most patients with VA present late, often with large, complex tumors difficult and even not amenable to treatment. They broadly fall into two categories: vascular tumours and vascular malformations. Their clinical and, often, psychological impact is determined by both pathological type and location: many lesions follow an uncomplicated natural course and other more complex, extensive or progressive lesions can present a threat to life from mass effect, haemorrhage or large volume arteriovenous shunting. Management options for vascular tumours include conservative approaches, oral medications and surgical intervention as determined by tumour type, location and associated complications. Vascular malformations can be categorised into Simple and combined. Simple lesions include capillary, venous, lymphatic malformations (LMs), arteriovenous malformations (AVMs), arterial fistula. Two or more vascular anomalies found nn combined lesions. The mainstay of treatment for these dynamic lesions is endovascular or surgical obliteration. The management of these anomalies in the head and neck is difficult and must involve a multidisciplinary approach.

Management Of Cleft Maxillary Hypoplasia - Holistic Approach

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Cleft maxillary hypoplasia is influenced by intrinsic deficiency factors, iatrogenic factors, functional distortions, thereby affecting the position and the relative growth of the maxilla-mandibular complex. The stigma of the cleft is overwhelming in the back drop of cleft maxillary hypoplasia, the single most motivating factor to seek treatment.

In most of the instances the cleft maxillary hypoplasia is evident during the pre -school age and mixed dentition period. Growth modulation therapy has a significant role, if not eliminating the deformity, at the least could minimize the severity thereby reducing the magnitude of the surgical
intervention. The subsequent role of alveolar bone grafting and orthodontic therapy cannot be denied by the virtue of the significant influence it has on the final outcome.

There is a plethora of surgical options in dealing with cleft maxilla, ranging from Lefort I advancement, Lefort I distraction to anterior maxillary distraction with each of the options having its own specific indications, advantages and pitfalls.

Cleft maxillary hypoplasia in bilateral cases needs additional focus on the position of the pre-maxilla and the volume of the prolabium which could significantly influence the final outcome. Therefore the role of pre-maxillary osteotomy and Abbe flap cannot be denied in certain instances.

Predominantly, the focus has been only on the cleft maxillary hypoplasia thereby neglecting the compensatory effects on the mandible resulting in inadequate treatment for the same (Mandible). This can very often result in a profile that is poorly balanced and sub optimal. In view of this, a holistic approach is imperative from the period of initial diagnosis till the completion of treatment with much emphasis on bi-jaw surgery to achieve the goal of an orthognathic profile.

This presentation aims to highlight the issues mentioned above with clinching scientific evidence.

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Models And Outcomes

Dr. Savitha VH
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Panel Discussion On P R Sequence

Moderator: Dr Nitin Mokal, Panelists: Dr Krishnamurthy B, Dr Mustafa K, Dr Nilesh Pagaria.

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Philtral Columns In Indian Children: A Normative Study Of The Morphology And Analysis.

Authors: Deyonna Deepthi Fernandes MS; Dr. Syed Altaf Hussain MS, FRCS, DNB, Jyotsna Murthy MS MCh DNB PhD

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Introduction: The philtral column contributes significantly to the concept of symmetry, shape and proportion of the upper lip. A natural philtral construction is essential for symmetrical and aesthetically pleasing lip in cleft surgery. This is particularly so in the bilateral cleft lip where the surgeon needs to simulate the philtral column during repair. Hence a study of the morphology and dimensions of the philtral column will provide a database that will serve as a guide for reconstruction.

Subjects and Methods: Fifty Indian children aged between five and ten were included in this study. Demographic data and standard photographs of the upper lip–nose complex with the philtral columns were obtained. The photographs were evaluated and graded accordingly.

Results: The morphology of the philtral columns was classified into four groups: (1) triangular, (2) concave, (3) flat, and (4) parallel. Proportionate dimensions of the philtral columns were also studied and analysed.

Conclusion: This study contributes to the basal values for the morphometry of the philtral columns in Indian subjects. It could augment
the reconstructive surgeon’s ability to correct the defect especially in bilateral cleft lip surgeries.

Keywords: Philtral column, Indian normative data, Cleft lip

To Evaluate The Role Of Inferior Turbinate Flap Used In Nostril Floor Closure In Cleft Lip Repair Surgery To Elevate The Alar Base And Achieve Nasal Symmetry

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INTRODUCTION : Cleft lip nose repair is a major challenge for the operating surgeon. The major issue which still remains to be tackled is achieving a acceptable nasal correction and achieve symmetry. The depressed nasal alar base on the affected side causes the tilted tripod sign and elevation of the alar base and maintaining its position is a huge challenge. The use of hypertrophied inferior turbinate on the cleft side used for nasal floor closure appears to be a good option to elevate nasal alar base.

AIM : To evaluate the role of inferior turbinate flap used in nostril floor closure in cleft lip repair surgery to augment the alar base and achieve nasal symmetry.

MATERIALS AND METHOD : A Group of 41 patients were taken in the study and they were randomized into two groups, Study group 21 cases who underwent primary lip repair with inferior turbinate flap and Control Group B, 20 cases without inferior turbinate flap. Age, sex, side of cleft and photographic evaluation of was done at 2 years and above post operatively for nostril height, nostril width, nostril basal width and alar base level.

RESULTS : On photographic evaluation group a showed statistically significant symmetry in the nasal architecture, and the long term follow up of these patients is necessary to comment on the aesthetic outcome.
CONCLUSION: Inferior turbinate flap provides an adequate tissue during nostril floor reconstruction and helped in augmenting the depressed alar base on the cleft side.

Advantages Of Bilateral Cleft Lip Repair Using Pfeifer’s Technique- A Study Of 129 Case

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Dr. Sivanagendra reddy, Director, Durga hospitals, Visakhapatnam, Andhra Pradesh

Background / Introduction: Repair of bilateral cleft lip depends on sound knowledge of anatomy, identification of landmarks, clinical variation of presentation, surgical expertise of the operator etc. Here with we are presenting a large series of cases done in our study.

Objectives: Evaluation of pfeifer’s technique in bilateral cleft lip repair

Methods: The study was carried out in patients attending Narayana dental college, Nellore and Durga hospitals, Visakhapatnam, Andhra Pradesh were considered for study. All cases were done using pfeifer’s technique. Pfeifer described a technique which involves changing the lip skin incision to a wavy line, thus making it less conspicuous. Pfeifer designed this incision using the concept of “morphological order”. The basis of this is that a skin incision between two points can be lengthened if both points are joined in a curved or wavelike manner and not in straight line.

Results: The results were evaluated and found to be good in terms of white roll match, vermilion match, Cupids bow, nasal architecture etc; clinically and statistically. The advantages of employing this technique are high lightened.

Conclusions: Though the technique is not new, but the literature available for the Pfeifer’s technique is less either in books or internet. The technique is easy to learn and teach. Good results were observed clinically and statistically.

References / Bibliography: Closure of cleft lips with wave line incisions according to Pfeifer Michael Bergermann, Hamm (Germany) and Cordula Tilkorn, Wellington (New Zealand)
The Fate Of Our First Six Consecutive Operated Bilateral Clefts Followed Over A Period Of 21 Years

Authors: Dr. Mahesh Prabhu, Dr. Namita Prabhu
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Aims and Objectives: to document the evolution of a consecutive set of six operated bilateral cleft patients since the infancy to adulthood their trials and the tribulations.

The first six consecutive patients of Bilateral complete cleft lip and palate operated by modified Mulliken technique by a single surgeon in the mid-nineties followed over a period of twenty one years or more have been studied. Their evolution and problems faced during their growth, the additional surgeries required their psychological upheavals the burden of care for the parents and their eventual acceptance of their cleft has been evaluated. This study demonstrates that though these children were born with a severe form of facial cleft they accept the fact that they were born with it and also can be accepted by their peers and can match them academically as well as socially. Of the six patients, patient no 2 was lost to follow up at the age of 10 yrs and patient no 3 was lost to follow up at the age of 14 all the other four were last followed up in August /September 2017. The work is still unfinished as at least a couple have consented for a rhinoplasty after their completion of the graduation /education.

Iliac Bone Grafting In Cleft Alveolus A One Year Observational Study

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Introduction: Alveolar bone grafting is an important part of the reconstructive journey for many cleft lip and palate patients. An alveolar bone graft is a surgery to add bone to the gum ridge in a child who was born with both a cleft lip and a cleft palate. The reconstruction of the alveolar cleft can provide both aesthetic and functional benefits to the patient. The best age at which to do the alveolar bone graft will be different for every child.

Aims & Objectives: To study the benefits of iliac crest as a bone graft in the cleft alveolus region

Methodology: After taking informed and written consent from the parent or guardian, this observational study was conducted among 10 patients in the age group of 9 to 16 years admitted in our centre over a period of one year. Both radiological and clinical evaluation of the patients was done. All patients underwent alveolar bone grafting with iliac bone graft under general anaesthesia.

Results:
4 patients (40%) had complete bone formation
3 patients (30%) had 75% bone formation
2 patients had 50% bone formation
1 patient had less than 25% bone formation

Conclusion: Alveolar bone grafting in cleft lip and palate showed 40% complete bone formation without complications using iliac bone graft. This observation needs to be supported with a large cohort study.

Effects Of Mucosal Lengthening At The Time Of Alveolar Bone Grafting On The Appearance Of The Lip In Children With Unilateral Cleft Lip And Palate

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Abstract: All children born with complete Cleft of Lip and palate require alveolar bone grafting (ABG) between seven and nine years to restore continuity of the alveolar arch and aid in eruption of the canine. Very often this requires extension of the gingival incision on to the buccal mucosa along the lip repair scar which lends itself to lengthening by Z plasties during closure. This has the effect of reducing the mucosal scar contracture with lengthening on the cleft side with vertical relaxation of the lip. In addition to this the advancement of the gingiva also moves the musculature of the lip towards the midline thereby relaxing the lip horizontally. This has the overall effect of enhancing the overall shape and pout of the lip.

This paper aims to evaluate the changes in the appearance of the upper lip and vermilion before and after the bone grafting procedure in 25 consecutive patients. This is done by evaluating the changes in lip and symmetry by measuring the proportionate vertical and horizontal dimensions of the lip, vermilion and philtral columns from standard photographs as well as subjective evaluation by three individual evaluators verified by intra-rater and inter-rater reliability tests.

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Is Point A A Reliable Indicator For Maxillary Position In Cases Of Cleft Maxillary Hypoplasia Treated By Distraction Osteogenesis?

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The cleft maxillae are notorious for their tendency to relapse after advancement. Even distraction osteogenesis with its advantage of ‘distraction histogenesis’ has its share of relapse in cleft maxillary hypoplasia. This fact had been the focus of many debates as to the advantages and disadvantages of the conventional osteotomy and distraction osteogenesis in the management of cleft maxillary hypoplasia.
The studies which have reported the stability of the maxilla almost always compare the position of point A in the assessment. The point A has been described as a dentoalveolar point and not a skeletal one based on the ease with which its position can be changed with incisor position.

In this scenario, it is attempted to evaluate the position of the maxilla after 5 years of advancement by distraction osteogenesis. Certain skeletal and dental parameters which were felt to be more reliable than point A have been assessed. The comparison is done on lateral cephalograms obtained immediately after debonding the orthodontic appliance after finishing the post distraction orthodontics and after 5 years of debonding.

Unilateral Complete Bony Synagnathia : A Case Report

Author: Dr. Parit Ladani, MDS

Congenital bony fusion of the mandible to the maxilla and zygoma (Bony synagnathia) is a rare disorder. The first case was reported in 1936 and only a few cases have been reported in the literature since then. Consequences of this bony fusion may range from feeding difficulties to a complete inability to protect the airway. Owing to the uncommon nature of this problem and the high recurrence of bony fusion, standardized treatment protocols do not yet exist. In this report, we describe the case of a female infant with complete bony fusion of the right zygomatic maxillary complex to the mandible. Mandible was separated by osteotomy before the fusion and used this site as pseudo joint until infant is older. Serial jaw manipulation and operative stretching was necessary to prevent refusion in the long term.

Syngnathia – A Case Report

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abstract
Syngnathia, is a rare condition that has been previously reported in the literature, denoting fusion between the maxilla and the mandible. This
condition ranges from only soft tissue fusion between gums known as synechia to bony union known as synostosis with different grades of fusion. About 27 previous cases had been reported in different regions of the world since 1948 in Germany till 2010 in India. In the present report a 14 yr old male was presented with Left Side Bony Fusion between Maxilla and mandible, associated with severe soft tissue loss (NOMA). A release of fusion and soft tissue reconstruction was performed. At 6 month review mouth opening was maintained at 30 mm.

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**Trans-Sphenoidal Encephalocele, Colpocephaly And Corpus Callosum Agenesis In A Midline Cleft Lip & Palate Patient – A Case Report**

Abstract Authors : Dr. Indranil Dutta, Prof.Dr.G.Nilamani Sharma Shija Hospitals & Research Institute Pvt. Ltd., Manipur
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A very few case reports was done in literature about trans-sphenoidal encephalocele with colpocephaly and corpus callosum agenesis in a midline
cleft lip and palate patient. No such case report was made from India. In this case, a 10 year old boy presented with speech problem and mild difficulty in breathing due to midline cleft lip and palate defect. Intra-operatively, we found a pulsatile, normal mucosal colour, compressible mass protruding from nasal cavity and clearly visible through the cleft palate. Cleft lip was operated at his 6 months of age. MRI report showed features suggestive of trans-sphenoidal encephalocele (TSE), colpocephaly and corpus callosum agenesis. Cleft palate was operated left untouched trans-sphenoidal encephalocele to improve the speech problem and to cover the encephalocele. Neurosurgical opinion said to review with endocrinologist and plan for operation in his second decade of life.

Is Cleft Still A Taboo? Beliefs And Expectations Of Parents Of Cleft Lip And Palate Patients: A Study From An Institute In North India

Debarati Chattopadhyay, Associate Professor, Department of Burns and Plastic Surgery, AIIMS Rishikesh

Abstract:

Introduction: Cleft lip and palate are a common but significantly disfiguring congenital anomaly affecting children. Besides the multiple problems they pose regarding the child’s feeding, speech and hearing, being visible they cause a major social stigma. Different degrees of parental guilt and shame are frequently encountered, primarily due to the perceived cause of the birth defect. This study aims to define some of these issues.

Materials and methods: A detailed questionnaire was structured based on a previous study by Weatherly White (2000). The questions were focused to identify parental perceptions concerning the causation of clefts and belief systems that might be responsible for these perceptions. They were also asked about the degree of social interaction the child was permitted with schoolmates and other peers. A second set of questions were used to know about the parental expectation from the surgery.
Results: Parents of 63 patients were interviewed and the results tabulated.

Conclusion: The study identified many cultural and societal attitudes that deeply affect the way that communities treat children with clefts and other facial deformities. The results interestingly almost mirrors the last study similar to this, almost 20 years ago. It is surprising to note the beliefs and perceptions about clefts have remained largely unchanged.

The Role Of Abbe Flap In Improving The Facial Profile In Bilateral Cleft Lip Deformity

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Introduction:
Patients with bilateral cleft deformities exhibit a negative profile despite having undergone corrective skeletal procedures. This is most often attributed to the volume deficit of the prolabium. The prolabium which is devoid of muscle is reconstructed by mobilising the muscle from the two lateral segments. This result in an increase in the length of the lip at the expense of the width making the lip tight and retrusive in relation to the lower lip creating a negative profile which at times is persistent. In such a scenario there is no other option but to restore the volume of the central segment by transferring an Abbe flap from the lower lip to create a balance between the upper and the lower lip.

Aim:

- To objectively evaluate the efficacy of Abbe flap in restoring the volume deficit of the prolabium.
- To objectively evaluate the profile changes that occur post Abbe flap transfer.

Methodology:
A total of 18 patients with the age ranging from 15-21 years were included in the study. The complaint of these patients were tight upper lip, severe
scarring of the prolabial segment and disproportion between upper and lower lip. Out of the 18 subjects 15 patients had undergone skeletal advancement of the maxilla and 3 subjects had a normal maxilla in terms of clinical and cephalometric findings. The procedure of the Abbe flap was carried under general anästhesia. The prolabial segment with the scar was marked. Local anaesthesia was infiltrated to achieve homeostasis. The central element of the lip with the scar was excised resulting in the release of the tightness and was also allowed to elevate the resulting defect. A template was created on the defect which helped to mark the outline of the Abbe flap and to determine the amount of tissue transfer from the lower lip. Then the full thickness flap was raised pedicled to the vermilion on one side. The flap was inserted into the upper lip defect and a three layered closure was carried out. The donor site defect was sutured.

Evaluation Of Autogenous Secondary Alveolar Bone Graft Using Cbct In Patients With Unilateral Cleft Lip And Palate

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Aim and objective
To assess the radiographic outcome of secondary alveolar bone grafting in individuals with nonsyndromic complete unilateral cleft lip and palate using cone beam computed tomography.

Materials & Methods
The study sample consisted of 10 patients with an age range of 7-12 years (Mean 8.4 ± 1.4 years). CBCT scans were taken before alveolar bone grafting and 3 months, 6 months postoperatively. Evaluation of success of
secondary alveolar bone grafting was done by 3D scale proposed by A J Forte. Volumetric and densiometric evaluation was also done.

**Results**

On 3D scale proposed by A J Forte, 80% of the patients had an acceptable outcome and 20% patients had an unacceptable outcome. The average volume of the preoperative alveolar cleft defect was 0.88 ± 0.49 cm³. Postoperative residual alveolar cleft defect at 3 months was .2±.18 cm³ and 6 months was .16±.18 cm³. Percentage of bone fill achieved was 76.23% and 82.13 % at 3 months and 6 months respectively with an absolute difference of 28.71% between 3 months and 6 months. Average density of bone graft was 375.38 ± 148.18 HU and 347.57 ± 137.10 HU at 3 months and 6 months respectively. The results were statistically significant.

**Conclusion**

Secondary alveolar bone grafting of the cleft defect in the present study achieved 80% success rate which were assessed by 3D radiograph scale proposed by A J Forte. CBCT is more precise and reliable gives accurate information about 3D morphology.

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**Assessment Of Postural Body Stability In Patients With Cleft Lip Or Palate**

A. Venkateswaran, R. Sivakumar, Sridevi Padmanabhan

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Body posture is the spatial orientation of the human body. For a balanced body posture, the center of mass of the person must be within the base of support with minimal postural sway. This body position is maintained by muscles, which in turn is governed by multisensory afferent inputs (visual, sensory and vestibular) within the central nervous system. Amongst the many factors influencing the postural body stability, the stomatognathic
system plays an important role. The integrity of the stomatognathic system is maintained by harmonious functioning of the different components of the system such as dental arches and masticatory muscles. Dental or skeletal malocclusions will disturb the equilibrium of masticatory muscles and hence the stomatognathic system having a consequential effect on the postural muscles of head, cervical spine and pelvis subsequently altering the body posture and hence the stability. Literature, thus far, has explored the association of body posture with various components of the stomatognathic system such as occlusion, temporomandibular joint and mandibular position. However, the relationship with postural body stability is an area of interest where there is paucity of literature. Very few studies have assessed the postural body stability in varying degrees of malocclusion and different skeletal bases, and to the best of our knowledge, there is no literature which has determined the stability in cleft patients. Our hypothesis was that the scarring of the cleft lip and palate post operation and the extent of skeletal discrepancy would alter the dynamism of the stomatognathic system and consequently affect the postural body stability. This study was therefore aimed at evaluating the effect of cleft on the static and dynamic postural body stability of patients.

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Impact Of Educational And Socioeconomic Status Of Parents On Healthcare Access In Cleft Patients

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Introduction:
There is a wide disparity in the access to treatment facilities between developed and developing countries in cleft lip and palate management. Factors ranging from poverty and illiteracy to paucity of healthcare services affect the patient accessing these services.

Objective:
Information regarding the socioeconomic and educational status of the
parents of cleft lip and palate patients admitted in a tertiary centre in Northern India was collected, and analyzed to find any correlation between the above and the age of child at first presentation to the hospital.

**Methods:**
Data was collected from parents of 200 consecutive patients of cleft lip and palate presenting for surgery. The data set included variables like age and sex of the child, age and literary status of the parents, household income, distance to the hospital from home and the source of information that made them visit the hospital.

**Results and Conclusion:**
There was significant association between the age of first presentation and the literary status of the mother and father (p values - 0.005 and 0.02 respectively), socioeconomic status of the family (p value - 0.02) and the distance from the hospital. Other observations, though impressive, were not statistically significant. This proves the impact of socioeconomic and literary status of parents on availing access to healthcare services for their children.

**Key words**
Cleft lip and palate, socioeconomic status, literacy, demographic data.

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**A Swot Analysis To Assess The Fate Of Facial Deformity Cases Among Comprehensive Care Providers: How Near Or Far We Are From Reality To Develop A National Level Protocol??**

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**AIMS & OBJECTIVES :**
The aim of this analysis was to develop a road map to extend comprehensive care for facial deformity correction in small towns and rural areas of the country. The chief objective was to do a pilot study to
check **STRENGTH, WEAKNESS, OPPORTUNITIES & THREATS (SWOT)** to grossly assess the existing care providers and blue print on which they are working in Bihar to correct facial deformity cases.

**METHOD**: A questionnaire was generated titled “survey on distribution, management, difficulties encountered and suggestions to improve comprehensive care to facial deformity cases in a conventional small surgical set up in Bihar”. This questionnaire was distributed among all concerned who run a set up to correct facial deformity cases in Bihar.

**RESULTS**: Less than 30% care providers were from small town. Only 60% of care providers were well trained to provide comprehensive care. 25% of care providers work like a team and rest 75% worked individually and could manage facial deformity only up to their specialized field. More than 80% cases seen of facial deformity were combination of congenital and acquired and out of which 60% were cleft lip and palate. Lack of awareness on methods to provide care was noticed upto 65%. Lack of funding support was seen among 65% whereas only 45% providers had diagnostic set up. Only 30% set up had emergency management backup.

**DISCUSSION**: A definite national level protocol must be generated to manage facial deformity cases in India, and considering the above strength weaknesses opportunities and threats faced by local care provided a road map can be generated to provide comprehensive care to facial deformity patients all over India.

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**Cephalometric Evaluation Of Increase In The Pharyngeal Airway Space Following Mandibular Distraction Osteogenesis With Genioplasty For Treatment Of Obstructive Sleep Apnea And Facial Anomaly Secondary To Temporomandibular Joint Ankylosis.**

Dr. Parit Ladani, Dr. Anvesha Banerjee, Dr. Tofiq Bohra
Abstract Presenting Authors : Dr. Tofiq Bohra
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ABSTRACT
Aim: The present study was carried out to evaluate the effects of distraction osteogenesis (DO) in management of obstructive sleep apnoea (OSA) and facial anomalies secondary to temporomandibular joint (TMJ) ankylosis.

Materials and methods: Ten patients were included in the study. Preoperatively the patients were worked up for polysomnography and cephalometric radiographs. TMJ ankylosis was released by doing gap arthroplasty before performing bilateral mandibular DO. DO was followed with 7 days latency period in all patients and rate of distraction was 1 mm/day till the mandibular incisors were in reverse overjet. After 3 months, advancement genioplasty was performed. Preoperative and postoperative oxygen saturation (OS) values and cephalometric values, including mandibular lengthening, sella-nasion-B point angle (SNB), and pharyngeal airway space (PAS) were collected from the same subjects at four points of time namely, pre-operative, immediate post-operative and after follow-up of 1 year and 5 years.

Ear Reconstruction Using Autologus Costal Cartilage: A Steep Learning Curve

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Ear reconstruction is a challenging operation with a steep learning curve. In view its rarity attaining a high standard for new surgeons is extremely difficult. This study analyses the first 53 ear reconstruction cases looking at complications, technique, pattern of progress and aesthetic outcome. The author performed 53 autologous ear reconstructions for microtia and post
traumatic ear defect over a period of 5 years utilizing the two stage technique popularised Firmin in most of the cases. There were 4 cases of partial skin necrosis. In early cases deficiencies were seen in the proportions of the reconstructed ear and the quality of definition. Better shape and definition were evident as more surgical experience was gained. This occurred as a result of increased appreciation of the ear proportions and improved framework carving. Although two stages were planned 4 cases required further procedures. The series demonstrates the early learning curve in microtia reconstruction and underlines the importance of appropriate training and case availability in achieving high quality results in autologous ear reconstruction.

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Changing Trend Of Cleft Patients Coming To Our Center

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Our center at Akola city in the Vidharba Region of Maharashtra State, Where I am practicing since last 33 years. I had operated many cleft patients in my private hospital and by taking operative plastic surgery camps at all the surrounding District. I had introduced in this city the concept of Operative Plastic Surgery camp in 1985 when Late Prof.L.K.Sharma, my teacher from Government Medical College, Nagpur was Chief surgeon. Since then lot of cleft surgeries are being done. In May 2008 my center became the partner of Smile Train Organization. Since then we started searching of the Cleft patients extensively. We could gather lot of cleft patients and quit a large no of adult cleft patients. I have already published my study as a series of 250 cases at the 15th IPRAS in Delhi in 2009. Then at IndoCleftCon 2014 at Lakhnow where it was 280 cases. But now the trend of Cleft cases coming to our center through various camps which we organize along with the Government Agencies like NRHM and SSA, maximum patients are small children. Now we rarely get adult patients.
**Conclusion**: Probably we had finished all the adult clefts in our region with extensive search. Even though with these much efforts still we get occasionally an adult patient.

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**Together Is Better: A Model For Cleft Care At A Tertiary Hospital Setting**

Prof. OP Kharbanda, Dr. Karthik S., Dr. Desmia Merlin Haldane, Ms. Anubhooti Nagar  
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Every two minutes a child with an orofacial cleft is born somewhere across the globe, the matter is of grave concern when it comes to the second most populous country in the world. As per the World Bank estimate, approximately 1.4% of India's GDP is allocated to Public health, it significantly translates into a challenge for health care providers in both public and private settings to provide cost effective treatment to every child. Over the past decade the work done by various missions and NGO's is commendable but the backlog and growing population demand the strengthening of the public systems of healthcare to achieve timely care to patients born with different kind of orofacial deformities such as clefts of the lip or palate.

This paper highlights the working of an integrated Cleft Care Unit of professionals from specialties such as Plastic Surgery, Pediatrics, ENT, Orthodontics, Genetics, Audiology & Speech Pathology and Information technology. The paper details the various barriers faced by patients in accessing quality cleft care and assesses the impact of this multidisciplinary model through the use of a study tool.

An effort to address different barriers faced along the journey of setting up the Combined Cleft Clinic has been undertaken through the years over different phases with the ulterior motive of not depriving any child of their unique smile.
Psychological Aspects In Cleft Patients- A Missing Link

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Cleft lip and cleft palate is one of the most common craniofacial anomalies affecting 1 in 700 children. Patients of cleft lip and palate often experience psychological problems such as difficulties during social interaction, lowered self esteem, anxiety related to speech and facial aesthetics, bullying by peers and siblings etc, which are often under estimated and unrecognized. It is surprising to know that less than 20% of world wide cleft patients undergo psychological assessment and help and undoubtedly as we all understand this figure will be much higher in India. In order to minimize the negative psychological impact, it is important to carry out a psychological assessment and counseling to children as well as parents or guardians.

Interventions such as counseling and social interaction skill trainings should be offered to increase the self esteem and social self confidence of the patient.

Existing multispecialty care for cleft patients in India is aimed at surgeries for cleft lip and palate, orthodontic treatment etc but surprisingly psychological issues of the care are more than often neglected. Everyone knows that parents and patients perception about the disease is very crucial component of care but often overlooked.

Cleft lip children also have effects on feeding, hearing, breathing and phonations which are needed to be addressed. For the positive outcome, along with the proper treatment, the child should grow up as psychologically strong with high self esteem to term the treatment as success.

The child goes through positive and negative challenges as he goes from child to adulthood which can make him strong or weak depending on his upbringing psychologically and otherwise also.
My talk is aimed to clinicians in the field of cleft including pediatricians, aesthetic surgeons, orthodontics and others involved not to miss this important aspect of care.

Title- Cleft Palate- Changing Incidence Or Neglect – Our Centre Experience

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ABSTRACT-Clefts, lip and/or palate (CL/Ps) are the most common craniofacial birth defects and represent about 15% of all birth defects. Various Indian studies have found the incidence of isolated cleft lip being much higher than the isolated cleft palate or cleft lip associated with cleft palate. The repulsive attitude of family and friends compel many Indian parents to seek treatment for the CL, but because observers cannot usually see the CP, there is significantly less social pressure to repair it. We have retrospectively observed the data over last one year for Cleft patient presenting to the OPD of a new dedicated pediatric tertiary care centre. We observed that out of 76 cleft patients 39(51.3%) were isolated cleft palates, 30(39.4%) lip and palate and 7(9.2%) were isolated lip (complete/incomplete). Amongst the cleft palate patients 26 were aged between 1-3 yrs of age and 18 of them being females, mostly presenting for hospital for poor speech. M:F ratio was 1:1.5. The observation may be due to changing incidence of cleft deformities due to changes in environmental factors or it may be a reflection of incomplete reach of various NGOs such as Smile train, govt schemes like RBSK and various other cleft centres offering free treatment existing in near vicinity.

Prevalence, Pattern And Perception Of Cleft Lip And Palate At A Tertiary Care Hospital In North India
Background: Cleft lip with or without cleft palate (CL/P) and cleft palate (CP), are common congenital anomalies, especially in Asia. This study aimed to analyse the demographic profile of CL/P and CP in North Indian Population.

Methods: A retrospective study of 128 cleft patients and their families was carried out between January 2017 to January 2018 at the joint Reconstructive and Orthodontic clinic at AIIMS Delhi. Data were collected by interviewing patients and caregivers & reviewing medical records.

Results: Revealed a higher percentage of males vs. Females 57.8 % vs. 42.1%, 50.8% belonged to Delhi, 53.15% families had >/= 5 members and 25% belonged to low socioeconomic status.

The majority of CLP patients were born to families in urban areas (85%), lower educational level, born in government hospitals and showed nonconsanguinous marriages.

Seventy six percent of the families sought advice for correction within 3 months of age. Ten percent had other congenital anomalies. Left > right (39.2 vs. 20.3%), group III being the commonest type (50.7%). 85% were operated before 7 years of age and 12.8% developed alveolar fistula. Primary lip repair was performed by 1 year in 80% and palate repair by 2 years in 88% cases.

More than one third mothers had history of previous abortions and interestingly 50% of them were exposed to smoke in their 1st trimester. None of them gave history of alcohol, smoke or substance abuse during pregnancy, however 14% had history of fever and two had radiographic exposure during antenatal period. In twelve cases 1° and five cases 2° relatives were also affected.
In 37% cases CLP moderately to severely affected social life of these patients.

**Conclusion:** This study reveals that both primary repair of cleft and palate repair was unusually delayed in the patients referred to AIIMS. The fistula rates were high too. These findings underline the need to explore reasons for delayed repair and could be a pointer to need for cleft surgical timing protocol for India.

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**Maternal Folic Acid Intake And Risk Of Non-Syndromic Orofacial Clefts: A Hospital-Based Case-Control Study In Bangalore, India.**

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**Background:** Orofacial clefts are the most common congenital anomaly worldwide, causing disfigurement and functional problems. The aetiology of clefts is unclear and appears to be multi-factorial with genetic and environmental components. Nutritional deficiencies have been suggested as a risk factor, particularly lack of folate. Whilst peri-conceptual folic acid supplementation has been shown to be protective for neural tube defects, current evidence for its role in cleft prevention is inconclusive with few studies from low and middle-income countries.

**Aim:** To investigate the association between periconceptual folic acid intake and incidence of non-syndromic orofacial clefts amongst infants in Bangalore, India.

**Methods:** A hospital-based case-control study (106 cases, 212 controls) utilising a questionnaire to collect data on pre-natal supplements, dietary folate and potentially confounding factors. Multivariate logistic regression analysis was used to assess relationships between folic acid supplementation and non-syndromic clefts, cleft lip and/or palate (CLP) and cleft palate alone (CP), adjusting for statistically significant confounding variables.
**Results:** A statistically significant protective association was found for separate folic acid supplements (not combined with iron or multivitamins) taken in the periconceptual period and all clefts combined (adj. OR 0.618, 95%CI 0.445–0.858) and CLP (adj. OR 0.570; 95%CI 0.379-0.856). Higher levels of dietary folate were found to be associated with a reduced risk for all clefts (adjusted OR:0.974, 95%CI=0.960-0.988), CLP (adj. OR:0.977, 0.962-0.993) and CP (adj. OR:0.955, 0.926-0.986).

**Conclusion:** This study provides some evidence for a protective effect of periconceptual folic acid supplementation for non-syndromic orofacial clefts. However, the results were mixed, and further research is warranted. This study revealed a low proportion of mothers taking folic acid supplements in the periconceptual period and highlights the need for increased education and awareness regarding pre-natal nutrition.

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**Otolaryngologic Assessment In CLP Patients: Clinical Prevalence, Correlation And Screening**

Dr. S C Sharma, Dr. O.P. Kharbanda, Dr. Shruti Marwah, Dr. Ashoo Grover, Dr. R.S Dhaliwal, Dr. Maneesh Singhal

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**Introduction**

The management of cleft affected children is a multidisciplinary affair with inputs from various specialities. There has been a well-documented relationship defined between cleft patients and otological manifestations as well as communication disorders.

**Methodology**

We present data of 20 cases of age group 5-14 years of group 1, 2 or 3 clefts (Nagpur classification) who visited combined Cleft Lip and Palate Clinic at Centre for Dental Education and Research AIIMS and Department of Plastic & Reconstructive Surgery, AIIMS, between January to December 2017. Their ENT assessment included various parameters as follows:
1. Otological assessment: status of the ear, tympanic membrane and audiological evaluation including pure tone audiometry and impedance.
2. Speech assessment: clinical evaluation including nasalance, speech articulation and intelligibility.

Results
Analysis of data revealed that 60 percent (12) of patients had normal tympanic membrane while 40 percent (8) had retracted or perforated TM. While 60 percent (5) had a mild hearing loss on objective audiological assessment, 40 percent (3) had a moderate-severe hearing loss. Speech assessment revealed that 70 percent (13) of cases had hypernasality, as well as 70 percent (13), had improper speech articulation, while 50 percent (10) had impaired speech intelligibility.

Conclusions
Cleft patients are prone to middle ear infections, and hence a comprehensive assessment is ideal. Though owing to non-cooperation some cases couldn’t be assessed objectively, the above statistics give us a fair idea of the prevalence of ENT disorders in CLP patients presenting to us. Also, through this method of assessment, we aim to screen out children requiring intervention in the form of tympanostomy tube insertion, as well further documentation of VPI through nasoendoscopy, thus emphasising the need for interdisciplinary co-operation.

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An Institutional Study Of The Soft Tissue Characteristics In Cleft Lip And Palate Cases

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Introduction
Clefts in the lip and palate is common with an incidence of 2 in 1000 live births in the Asian population. Various protocols exist for timely repair of these clefts. However, the methods of repair and the timing of repair are not uniform across the institutions. This study aimed to analyse the soft tissue characters of the lip and palate and identify the variations.

Methodology
A retrospective study of 119 cleft patients coming to the joint Orthodontic and Reconstructive clinic of AIIMS, Delhi between January 2017 to January 2018 was carried out by examination and filling up a structured proforma with fixed soft tissue characters and measurements.

Observation
Most patients visiting AIIMS (60.5%) were operated in other institutions with varied treatment protocols and reported to AIIMS for further management. Of these subjects, 73.9% had a good facial symmetry. However orthognathic profile was not maintained in most of the cases (71%).
Majority of the clefts were left sided and complete, mostly belonging to group III. Length of the lip scar varied from 3mm-25mm with a majority being vertical (70.6%). The depth of labial sulcus varied from 0-15mm. Lip seal was maintained in 72% of patients at rest. Scar quality was fair in 65.5% of patients. However, 58% of patients had vermilion asymmetry, with overall lip symmetry ranging from poor (6%) to excellent (5%) with mostly being fair (57%). The secondary nasal deformity was high with a deviated septum (64%), wide alar base (73%) and nasolabial appearance as measured by Asher-McDade score falling in the fair category.
Length of the palate was adequate in most (60%), with acceptable scarring (59%). Velar mobility was satisfactory in 61% cases; however, uvula was not well formed in 67% cases with absent passavant’s ridge in 88% of those patients with under-developed or bifid uvula. 47% of patients had a palatal fistula, mostly in the alveolar and postalveolar region. 58% of them were symptomatic with regurgitation, and 82% had speech anomaly.

Conclusion
Variable timing and technique of repair in different institutions yield varied results. With high vermilion and lip asymmetry rates and high incidence of palatal fistula, a perfect outcome is yet to be achieved in most of the cases. Secondary procedures are needed in most of the cases. These observations suggest that cleft surgery protocol needs to be popularized and need for training of the surgeons on surgical aspects of cleft repair.

The Cleft Rhinoplasty- Do Types Of Cartilage Grafts Matter?

Dr. Shruti Marwah, Dr. Shashank Chauhan, Dr. Maneesh Singhal, Dr. OP Kharbanda

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Introduction

The unilateral cleft lip nose is characterised by numerous complex and interdependent deformities involving the soft tissues and skeleton of the nose.

Surgical techniques rely on well-accepted rhinoplasty principles. Placement of cartilage grafts for support and reinforcement is a major component of the cleft rhinoplasty as they allow for improved tip definition, and prevent wound contracture and collapse.

Methodology

We present a series of 10 patients of cleft nose with various deformities operated between January 2017 to January 2018 at AIIMS, New Delhi. We have attempted to review the use and assess outcome of various cartilages, in different cases as follows:

1) **Conchal cartilage**: used in two patients for placing columella strut with shield graft.
2) **Costal cartilage**: used in 6 patients for L-strut placement along with use of diced cartilage wrapped in anterior rectus sheath or surgicel.

3) **Septal cartilage**: used in one case of **Tessier cleft 0** for L strut only.

4) **Costal and Conchal cartilage**: One patient underwent use of both costal cartilage for L-strut and diced cartilage wrapped in surgicel and conchal cartilage as alar batten graft.

**Results**

The follow up ranged from 4 weeks to 1 year with good aesthetic outcomes except in one case where cartilage got necrosed due to infection.

**Conclusions**

A tailor made approach is required using different types of cartilage. Autologous cartilage has been the preferred method of nasal reconstruction. Conchal cartilage is a good material for tip and alar grafts because of its pliability and convexity whereas rib cartilage, which is stiffer and thicker, will provide good supporting grafts. Diced cartilage wrapped in fascia (DCF) can be a very good option for dorsal onlay graft, avoiding irregularities, twisting or warping of costal cartilage.

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**Correction Of Cleft Lip Nose Deformity**

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Correction of Cleft lip nose deformity is a difficult challenge for cleft surgeons. Though, Primary repair of cleft lip nose deformity has been accepted worldwide, there are many variations amongst surgeons involved in cleft care. To demystifying the controversy of primary correction of cleft lip nose repair, we have done an internet based survey to define consensus among surgeons. A 15 items questionnaire was framed and sent to the all plastic surgeons of India as well as oral & maxillofacial surgeons, Head &
neck, ENT & Pediatric surgeons of the country involved in cleft lip surgery. The questionnaire was categorised in the form of repairing the nose deformity with cleft lip, approach to address such deformity, secondary complications & residual deformity present and satisfactory outcome in order to make a common consensus among surgeons involved in cleft surgery.

The total respondents included 91.8% Plastic surgeons and 9.3% Oral & Maxillofacial surgeons doing cleft surgery.

Almost all of them (100%) felt that nose deformity is a part of cleft lip, but only 81.3% agreed that nose deformity correction be done at the same time as cleft lip repair. Those who performed nose correction were about 58.1%, who always addressed nose deformity whereas 38.7% performed it sometimes.

68.8% address mostly flaring of ala whereas 52.1% address depressed nasal dome also while 24% address all the deformities. The maximum group, 45.3% prefer semi-open approach; whereas almost equal group 42.1% feel closed approach is sufficient enough to address all deformities. As per age of primary correction of nose deformity, 43% do it at the age of 3-4 months along with cleft lip repair whereas 33% wait for 6 months.

Regarding extent of dissection, 31.2% believe in minimum dissection, whereas for 62.7% it varies according to deformity. 89.7% feel primary correction reduces the deformities and 54.1% people feel only 25% patients may require revision before 7 years of age. However 59.6% prefer to revise the nose correction secondarily at adolescent age. About 29.3% surgeons were satisfied with their result in almost 50-75% of their patients and equal group in their 25-50% of patients’. The main complication they encounter was residual nose deformity in about 75.8%.

87.8% believe there is no maxillary growth disturbances following nose repair and 87.52% are in favour of doing nose correction at the time of cleft lip repair.

To conclude, nose deformity is a part of cleft lip and it should be done at the time of cleft lip repair. The optimum age of repair is same as for cleft lip. The approach required may be ‘semi-open’ to ‘closed’ depending upon the surgeon’s expertise & experiences and extent of dissection may varies according to deformities. However a small group of patients may require
secondary correction, but it is evident that primary correction reduces the deformities and it should be an integral part of cleft lip repair.

The Supernumerary Nostril: A Case Report

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Supernumerary nostrils are very rare type of congenital nasal deformity, with only limited cases reported in the literature. They can be associated with other malformations such as facial clefts and they can be unilateral or bilateral, with most cases being unilateral. The supernumerary nostril may or maynot communicate with the ipsilateral nasal cavity, probably depending on the degree of embyological progression of the anomaly. Since 1906 when the first case was reported by Lindsay. We hereby reporting a case which was encountered at our institution with a supernumerary nostril that was located above the left nostril. We thus performed a surgery to correct the deformity. The need and the surgical technique has been discussed thoroughly in this report.

Management Of Secondary Cleft Nose Deformity With Floating Costal Cartilage Graft

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Aim: Use of floating costal cartilage graft for correction of cleft nose deformity.

Material & Method: Seven patients with unilateral cleft lip nasal deformity were operated by open rhinoplasty. Bilateral lower lateral cartilages were dissected with division of lower lateral cartilage on cleft
Floating costal cartilage was harvested from the side in which the deformity was present. An alar strut graft of costal cartilage was sutured over the lower lateral cartilage taking advantage of its natural curve. If required thinning of cartilage was done. Septal augmentation was done in all patients along with thinning of skin at nasal tip. Sutures were removed on seventh postoperative day.

**Results:** In all patients wound healed satisfactorily. Edema was present in initial 3-4 weeks in all patients. Two patients complained of pain at cartilage donor site. In all patients improvement was achieved in nasal tip projection. Alar base augmentation was done in two patients. Mild to moderate improvement was achieved in nostril size on cleft side. Depression along alar rims was corrected in five cases.

**Discussion:** Correction of cleft lip nasal deformity is a challenging task. Improvement in nasal tip projection and concavity of alar rim is best dealt by supplementing these structures with cartilage graft. Septal and auricular cartilage is preferred in cleft rhinoplasty. Costal cartilage graft are available in ample amount but has disadvantages of warping and an additional scar. In our study we have harvested floating costal cartilage and used its natural curve for correction of alar rim deformity.

**Conclusion:** Free floating costal cartilage can be one of the options for correction of cleft nose deformity with disadvantage of an additional scar at donor site.

**Correction Of Secondary Deformities In Cleft Lip Patients**

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The state of the art in the primary treatment of Unilateral and Bilateral Cleft Lip patients has improved phenomenally. However, despite the best efforts, secondary blemishes do occur. Secondary deformities of the
Unilateral Cleft Lip include Scarring, Notches of the Vermillion, White Roll discrepancies, Short lip, Lateral Vermillion Deformities. In Bilateral Cleft Lips these include Scarring, Central Vermillion deficiencies, Tight upper lip. An attempt is made to determine the causes, their prevention and our approach to their treatment.

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**Columellar Strut Graft In Secondary Cleft Rhinoplasty-Anthropometry & Clinical Outcomes**

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**Introduction:** The cleft nasal deformity is a three dimensional abnormality involving all layers of nose, beginning with skeletal platform and extending into the vestibular lining, cartilaginous infrastructure, external nasal skin. Skin and soft-tissue alterations for many patients do not provide long term correction against the relentless resistance of deformed skeletal and cartilaginous structures associated with clefts. Columellar strut graft is an important method to provide support to the skeletal framework in an attempt to retain structural support and balance.

**Aims:** The purpose of our study is to describe the clinical outcomes following the use of columellar strut graft in secondary cleft rhinoplasty. The study was designed to identify the changes in tip projection, tip rotation and other anthropometric measurements postoperatively.

**Methods:** A Prospective study was conducted among patients presenting with secondary cleft nasal deformity. These were operated utilizing a columellar strut graft and followed up for a minimum of 9 months. Detailed local examination and photographic documentation was done preoperatively. The parameters considered were columellar height (CH), columellar width (CW), alar width (AW), alar base width (ABW), nasal sill right & left, nasofrontal angle (NFR), nasofacial angle (NFA), nasolabial angle (NLA), tip projection (TIP PROJ), tip rotation (TIP ROT). All the patients were followed up at 1 month, 3 months and 6 and 9 months.
During each follow up visit photographic documentation was done and various measurements recorded. All the measurements were analysed statistically.

**Observation And Results:**

During the study period, 27 patients were enrolled in the study. Out of which 2 were lost to follow up and results could be evaluated for 25 patients. The tip projection increased in 21 out of 25 patients (84%). The magnitude of difference between pre and post op follow up at 9 months was statistically significant (p value-0.009). The columellar height increased in 20 patients (80%). The tip rotation increased in 20 patients (80%).

**Conclusions:** From our study we conclude that columellar strut is necessary in improving the tip projection, correcting the tilted tripod and lower lateral cartilage deformities. The columellar strut has a role not only in supporting weak lower lateral cartilages but also its function as a central scaffold on which the tip structures can be unified.

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**Evolution Of My Techniques In Cleft Lip Nose Rhinoplasty**

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Rhinoplasty is considered the most difficult operation in Plastic Surgery and correcting a cleft lip nose deformity remains a daunting task for a rhinoplasty surgeon. A cleft lip nose not only has all the structures of the nose involved but even the platform (maxilla) over which it rests is also found to be hypoplastic. To achieve good aesthetic results in these cases, a surgeon needs to address all deformities of nose and surrounding structures.

A cleft lip nose deformity is akin to a combination of long standing severely crooked nose, secondary nose and a post traumatic nose. It has severely deviated and displaced septum of a crooked nose; distorted, deformed and deficient lower lateral cartilages of secondary noses and other deformities of osseo-cartilagenous framework of nose and surrounding structures,
akin to a post traumatic case. Other peculiar deformities like web on cleft side of nostril throw additional challenge.

The preference of the patients in this era is very different from past as now they prefer a natural looking nose in harmony with the face over a nose which is well designed or perfect in shape but either looks operated or doesn't match the facial features. Cleft lip nose deformity patients wish for the same, and the older notion of whatever you do in these noses, the patient remains happy, is no longer true in this era. The author started doing rhinoplasties 10 years back and has experienced gradual change in his thought process as well as techniques. In this talk, he would like to discuss the progression and evolution of his techniques over the period, reaching to the present time.

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Island Prolabial Skin Flap In Correction Of Bilateral Cleft Lip Nose Deformity

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Aim in treating bilateral cleft lip nose deformity is

1) Have good philtral columns and cupids bow
2) Provide good muscle continuity
3) Provide adequate columella height

The cases included in this series had adequate prolabial tissue, Good lateral vermillion bulges & good muscle bulk

The prolabial skin used as fork flaps to lengthen the short columella and central cosmetic unit of Philtrum raised as inferiorly based island subcutaneous pedicled flap.

Bilateral white roll and vermillion advanced to form new cupids bow and vermillion pout below.

Muscle bulges dissected laterally and sutured above. Island prolabial flap sutured back as new central philtral cosmetic unit.
Advantage of using this technique provides simultaneous correction of Lip & vermillion, muscle continuity and nose correction

Photography In Rhinoplasty

Dr. Kapil Agarwal
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Founders’ Lecture

Dr. Jyotsna Murthy, Immediate past president, ISCLPC&A

The mystery of the Median Tubercle of Cleft Lip

The components of upper lip include two labial elements, philtrum with philtral column, vermillion and median tubercle. The median tubercle is the most prominent part of lip highlighting beauty and sexuality, particularly in women. The median tubercle is generally visualized in mind as small central projection in upper lip, however, in reality it is broad gradual elevation of approximately central one third of lip. The line drawing of figure shows the extent of central prominence, which is visible in normal lip. This median elevation has racial and sexual difference with individual variation. It is visually attractive by change of color, particularly of in the vermillion due to increase vascularity and its prominence and volume. The tubercle of upper lip is less studied in medicine compare to sciences related to eroticism.

Cleft lip repair is more of art than science. Artistic band of mind and eye for shape and beauty are essential to get the best outcome. Tubercle of upper lip is the most prominent and beauty spot, but very little attention has been paid while describing techniques of cleft lip repair. In addition, little has been written about its anatomical extent, variability and measurement in various age. Even popular book of Anthropometric Measurements by Farkas L, has also not measured or mention about tubercle width or proportion.
Nature has given beauty unique to each individual to break monotony of the creation. And so the tubercles of lip, they are different in every individual. And therefore, we cannot have one imagination to create tubercle for all the cleft patients. We need to heighten our perception to observe the uniqueness of beauty and shape for every human and same way for the lip of a cleft child. Heighten perception and keen observation of lip in cleft child, then supplementing our scientific knowledge to repair lip will bring out the lip which is closest to what nature intend to created before cleft happened!

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Role Of Paediatrician In Cleft Missions.

Elena Belonogova

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Single Stage Bilateral Lip Repair Along With Primary Extended Open Tip Rhinoplasty In Bilateral Complete Cleft Of Primary/ And Secondary Palate : A Review Of 200 Cases

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Introduction:

Obtaining an acceptable pleasing results with elongation of columella and nasal definition in bilateral cleft of the lip is a challenging proposition especially with projecting and deviated premaxilla. The current methods have focussed mainly on lip repair with lesser emphasis on nasal repair. This report is a review of 200 cases with the technique we use at our tertiary cleft care centre,

Material and Methods:

Over 25 months period, 200 consecutive cases of bilateral complete cleft of primary and secondary palate were managed with the new technique. To gain access to the lower lateral cartilages, the prolabial flap was raised...
along with the columella. Further access to the nasal dorsum was facilitated by infracartilage rim incisions. Dissections were done up to the root of the nose superiorly and to the lateral ends of the lower lateral cartilages. While the lip skin and vermilion were repaired as per existing techniques, nasal tip projection was increased with interdomal suturing. Medial crura of the alar cartilages were sutured to each other to strengthen the columellar support. Additionally, the anterior palatal repair was done by suturing bilateral vomer flaps to lateral nasal mucosal flaps. No mucosal strip was left back on the vomer. The vascularity of the prolabial flap and vomer was assessed clinically and monitored by daily clinical photographs.

Results:

There was optimal appearance of the lip with improved nasal tip projection in all cases. There was no incidence of prolabial or vomer necrosis. In 14 patients there was venous congestion of the prolabium in first 48 hours which settled over the next 3 days. Minimum follow up was 3 months and maximum 2 years and 3 months. There was mild inflammation and redness in 6 patients nasal asymmetry in 9 patients, notch in ala in 5 patients, pinched up nose in 4 patients. There was no incidence of suture line dehiscence in any case. None had any breathing problems.

Conclusion:

Simultaneous lip and nose correction is facilitated by the primary extended open rhinoplasty approach and provided pleasing nasal symmetry and shape and elongated columella and no breathing problems in the postoperative period. The technique does not appear to be associated with any prolabial and vomer devascularisation.

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Repair Of Complete Bilateral Cleft Lip With Protruded Premaxilla After Synchronous Palatoplasty And Premaxillary Setback.

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Objectives:
Repair of complete bilateral cleft lip with protruding and or twisted Premaxilla is a difficult task. In such case cleft lip repair after setback of protruded pre-maxilla gives better result than primary repair of Cleft lip after the age of nine month.

Methods:
This is a prospective case study. Comparison was done with the results primary cleft lip repair done previously by me or done by others. Simultaneous palatoplasty and premaxillary setback were carried out in 68 patients from January 2013 to December 2016. Patient ages ranged between 9 months to 14 years. There were 46 male patients and 22 female patients. During palatoplasty, good exposure of the vomer made premaxillary setback easy without compromising the blood supply to it. The Premaxilla, after osteotomy, was immobilized in all patients by using the Kirschner wire. Palatal closure was achieved with two flap techniques. Cheiloplasty was done 6 months after the pre-maxillary setback.

Results:
The follow-up period ranged between 6 months to 2 years. Proper positioning of the pre-maxilla was achieved in all patients, with good labial repair. There were no complications like loss of the Premaxilla or vascular compromise. In 5 patients, the Kirschner wire became loose and came out within 3 weeks. 3 patient had palatal fistula and 15 patient had a post-alveolar fistula which need repair. All of these patients successfully underwent lip repair without tension 6 months later.

Conclusions:
In children with bilateral cleft lip and palate and protruding Premaxilla, this technique is advantageous in achieving good results of lip repair in such child.

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Does Presurgical Unilateral Cleft Lip Anthropometrics Determine The Outcome?

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Objective: To investigate associations between cleft lip anthropometrics and outcomes in unilateral cleft lip patients.
**Design:** Prospective Randomized clinical trial

**Patients:** Children with unilateral clefts of the lip, with or without cleft palate.

**Methods:** Anthropometric lip measurements, made immediately prior to lip repair, were available for each patient. These measurements were further correlated with the Operation smile cleft severity index. Immediate postoperative pictures of the surgical outcome were captured to record close up of the lip repair and worms view for the nasal correction. These pictures were randomly sent to three evaluators for aesthetic analysis using Operation Smile aesthetic index. Acceptable intrarater reliability was noted. The average values from the three evaluators were noted and analyzed.

**Results:** Fifty patients were included in this study. The cleft lateral lip element was deficient in height in 76% and in transverse length in 74% of patients. Patients with more deficient cleft height and transverse length were correlated to be classified as severity 3 and 4 of the Operation smile cleft severity Index. Nostril width ratio was an important determinant to further classify them into severity 3 and 4. On using a Pearson product-moment correlation to determine the correlation between cleft severity and aesthetic outcome there was a mild, negative correlation between them, which was statistically significant ($r = -0.3964$, $n = 50$, $p = .0044$). This test shows there was a statistically significant correlation between cleft severity and aesthetic outcome ($p=0.0044$). However, the relation was negative, which means as cleft severity increases, the aesthetic outcome decreases and vice versa. The power of this relation is $r= -0.3964$

**Conclusions:** In patients with unilateral clefts, cleft lip anthropometrics have a predictive role in outcomes.

**Application Of Craniofacial Principles To Complex Congenital Facial Reconstruction**

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INTRODUCTION

Craniofacial surgery services are not uniformly accessible in India, a country with an approximate population of 1.3 billion. Most craniofacial surgery centres are located in teaching medical hospitals/institutions. The team at the new centre started in January 2014, consisting of a Plastic Craniofacial Surgeon, Neurosurgeon, Neuro-anaesthesiologist and Paediatric intensivist.

AIM: To present clinical outcomes of all transcranial cranio-maxillo-facial surgery cases performed and discuss challenges faced in developing a new craniofacial centre, in the context of a developing country.

METHODS: All transcranial cases over a 4 year period from 2014 to 2017 were reviewed, analysing patient demographics, patient charts and complications. All patients were prospectively followed up with meticulous photographic and functional documentation.

RESULTS: The total number of patients who underwent transcranial craniofacial surgery over a 4 year period was 45; craniosynostosis 22, Hypertelorism 3, tumours 3, trauma 6, distraction 6 and complex deformity correction 5. A new technique of endoscopic craniosynostosis correction was introduced in India. The most common complication was dural tear resulting in CSF leak, which occurred in 5 patients and settled with conservative management. No mortality was seen. Mean length of hospital stay for all patients was 5.5 days, with a mean of 1.5 days in intensive care.

Three dimensional printing technology was introduced in planning and execution for the majority of cases.

CONCLUSION: Outcomes of Craniofacial surgery at the Craniofacial centre are acceptable and comparable to well established units, where like-minded clinicians work for a common purpose.

Techniques Of Contouring Calvarial Bone For Cranial Remodeling
Background and Aims

Cranial vault remodelling is a surgery to correct the contour of the deformed head in craniosynostosis. The type of deformity to be corrected is either a convexity or a concavity of the calvarium. The skull bone is often not pliable to allow contouring without performing specific cuts (osteotomies) in the substance of bone. There can be many ways of performing osteotomy ranging from partial cut, full thickness cut, straight cut and spiral cut. This presentation details the various techniques of osteotomies of calvarium so as to achieve the desired contour of the bone in cranial remodeling.

Materials and Methods

22 children with various types of complex craniosynostosis were operated for cranial vault remodelling during the period from 2011 to 2016. The age ranged from 6 months to 19 months with male female ratio of 1.5:1. There were 10 cases of coronal, 9 cases of sagittal and 3 cases of complex craniosynostosis. All children underwent total cranial vault remodelling with restoration of cranial symmetry.

The techniques of bone remodelling included mainly spiral osteotomies in different configurations depending upon the abnormal anatomy of the bone. The spiral osteotomy allows desirable reshaping and recontouring of the deformed calvaria. The precise markings of the spiral cuts and their topography needs to be individually assessed. The method of fixation varies from interosseous sutures to interosseous wires in paediatric calvarium.

Results

Satisfactory aesthetic and functional results have been obtained in the series using the technique of spiral osteotomy based cranial vault
remodeling. All the children are kept on postoperative cranial moulding to maintain the results of surgery.

**Conclusions**

Spiral osteotomy holds the key to optimal cranial vault remodeling in craniosynostosis. The geometry of the cuts however needs to be cautiously planned to achieve desirable contour.

**Management Of Cleft Maxilla**

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**Hemifacial Microsomia - A Multidisciplinary Approach To Care**

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Hemifacial Microsomia is a congenital anomaly involving maldevelopment of both the soft and hard tissues of one half of the face. The spectrum of involvement ranges from a very subtle contour change to extensive involvement of the ear which may not only be deformed but also mal-positioned, the temporomandibular joint, mandible and overlying soft tissue, including facial palsy.

The management of this malady starts early from orthodontic corrections, to correction of the ear soft tissue and bony deformities at different ages. The authors present 3 patients, ranging from 5 years to 28 years. The patients presenting early were treated with correction of their ear deformity using costochondral grafts. The adult patient, presenting late, was treated in phases with bony reconstruction of the mandible, followed by soft tissue augmentation, and orthodontic correction. The planning of soft tissue and bony volumetric loss was planned using digital subtraction radiology.
Clinical features and outcomes of these patients will be discussed, emphasising the need for planning.

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**Rare Craniofacial Clefts**

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Cases of rare types of Craniofacial clefts including syndromes seen in last 25 years of private practice are discussed here as regards its evaluation and management. The investigations and planning on models before surgery is shown step wise where osteotomies were required. Soft tissue corrections are also discussed.

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**Aesthetic Camouflage For Correction Of Cleft Deformities: Surgical Options And Outcomes**

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Following corrective surgery of the cleft lip & palate, a secondary facial deformity be it mild, moderate or severe is an inevitable consequence of even the most diligent & meticulous surgery. Besides the soft tissue disabilities of the lip & nose, most patients present with an obvious element of maxillary hypoplasia, consequent to maxillary regression resulting in a grotesque class III skeletal deformity. In addition, concomitant nasal deformities do occur which also need to be addressed. These deformities could also be a result of repetitive surgical interventions done in a manner that do not follow a chronological sequence of procedures.

Given a choice most patients who present for the correction of the residual aesthetic deformities do not subscribe to a prolonged and a cumbersome distraction osteogenesis schedule. Also many of these patients having gone through an array of surgical procedures are now looking for an aesthetic correction with minimal surgical morbidity and downtime.
Careful and diligent planning of combining orthognathic procedures in conjunction with facial implants and rhinoplasty can produce predictable & excellent results much to the satisfaction of the patients. Cases illustrating this very concept are presented and discussed.

Fistula Free Cleft Palate Repair – Description Of A Technique

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Palatal fistula is one of the commonest and most unwanted potential complications of palatoplasty. Different studies have described the rate of fistula formation from 2% to 11%. The commonest place of fistula formation is at the junction of the hard and the soft palate. Fistulas cause significant morbidity to the patient in terms of nasal regurgitation of food and fluids, poor speech outcome and have a detrimental effect on oro-nasal hygiene. However, the rate of fistula formation can easily be brought down and the results of palatoplasty significantly improved upon by adhering to certain basic principles. The authors describe their technique of hard and soft palate dissection, nasal layer mobilization and suturing technique, which produces excellent surgical results and is nearly fistula free. It also has the added benefits of having negligible effects on middle ear function, which is another very common undesirable outcome of palate repair. The technique is easily taught, replicable in other hands and when learned correctly produces consistent results.

Cheek Flap: Revisited

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Cheek flap is an intraoral mucomuscular flap being freely used for the intraoral defects.

Primary palatal repairs usually leave behind an occasional fistula. This fistula could be anywhere between the alveolar margin to the posterior soft palate dehiscence.

In our centre we utilise this versatile flap for multiple defects.

In our series of over 100 cheek flaps we wish to showcase the efficacy of this flap.

The defects covered are:

1. Anterior palatal fistulae,
2. Junctional fistulae
3. Dehiscence anywhere in the suture line.
4. Velo pharyngeal incompetency (VPI) used as a filler to extend the length of the palate.
5. Lateral wall defects on the bony palates.

The complications are also frequent:

1. Complete dehiscence because of infection and poor oral hygiene.
2. Flap necrosis due to overzealous dissection.

Conclusion;

It is very versatile flap with no donor area morbidity and can cover almost all secondary defects of a secondary or a failed palate.

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Evaluation Of The Role Of Pedicled Buccal Fat Pad In Primary Palatoplasty And Its Impact On Maxillary Growth: Early Outcomes

Dekid Palmo, Brijesh Mishra
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**Objective:** To study the role of pedicled buccal fat pad in primary palatoplasty and to assess the effect on maxillary growth

**Method:** Twenty patients of UCLP in King George’s Medical College, Lucknow, at the age of 9 to 12 months were planned for palatoplasty. Group 1: two flap palatoplasty with bilateral pedicled buccal fat pad to cover the lateral defects. Group 2: two flap palatoplasty without buccal fat. Group 3: Ten patients with normal lip and palate. Preoperative and 1 year postoperative dental arch length width was measured in dental cast. Postoperative pain, epithelisation, cheek deformity, bleeding, infection and fistula noted. Statistical analysis: Quantitative variables-Mann-Whitney Test, paired T test and ANNOVA. Qualitative variables -Chi-Square test.

**Results:** Postoperative pain score of Group II (6.10±1.29, median 6.00) was found to be statistically significantly higher than that of Group I (4.20±0.92, median 4.00). At 1 week, epithelization was observed in 8 (80.0%) children of Group I and in 3 (30.0%) of Group II. None of the patients developed cheek deformity, bleeding, infection or graft loss). After 1 year of palatoplasty, anterior arch width of Group I (30.50±2.99 mm) was found to be higher as compared to Group II (28.70±1.42 mm) and Group III (27.70±1.16 mm) (p=0.115). Increase in arch length and arch width were not statistically significant.

**CONCLUSION:** Patients of palatoplasty with buccal fat pad have decreased postoperative pain. There is a significant increase in anterior arch width of Group I (30.50±2.99 mm) as compared to Group II (28.70±1.42 mm) and Group III (27.70±1.16 mm), (p=0.115). The use of buccal fat pad in palatoplasty promotes early epithelization, less scarring and hence lesser growth restriction. As palatal growth continues upto adulthood, longer follow ups are required to assess the long term impact of buccal fat pad on maxillary growth.

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**Palatal Fistulae: A Comprehensive Analysis Of Cases In A Tertiary Care Center**

Dr Sharmistha Bhattacharyya, Dr Shashank Chauhan, Dr Shamendra Sahu, Dr Maneesh Singhal, Dr O.P. Kharbanda

Abstract Presenting Authors : Dr. Sharmistha Bhattacharyya

Institution : All India Institute of Medical Sciences, New Delhi
Palatal fistula by definition results from an inadequate surgical procedure. Fistula rates reported in the literature range as high as 58% with a recurrence rate of nearly 33%. The problem is complicated by a lack of consensus regarding a treatment protocol. Although various classifications have been proposed, there is a lack of comprehensive stratification to assess the intraoperative difficulty.

**Materials and Methods**

We reviewed 10 cases of the palatal fistula with a minimum follow-up of 3 months from October 2016 to October 2017. Patients were evaluated based on fistula characteristics, previous surgeries, symptoms and functional abnormality. A scoring system was devised based on these parameters with a minimum score of 6 and a maximum score of 14. Fistulae were classified into 3 groups: Grade 1: score 6-8, Grade 2: 9-11 and Grade 3: 12-14. The data was tabulated and analysed.

**Results**

The recurrence rate was found to be 14.5%. Recurrence rates were found to be 7.67% for a unilateral while but bilateral cases it went up to 16.87%. The outcome also varied depending on the fistula characteristics. We did local transposition flap for 3 fistulas which were longitudinal, and transverse anterior palatal fistulas were managed with superiorly based (Retrograde) Facial artery myomucosal Flap cover (5), while two patient underwent tongue flap of which one had recurrence and managed with FAMM flap.

**Conclusion**

Comprehensive evaluation of palatal fistula helps in the pre-operative judgment of the outcome and is essential to plan the surgical treatment to give better results. Bidimensional fistulae in the hard anterior palate are associated with higher recurrence rate. The incidence of fistula rates are higher in bilateral cases and is more challenging to manage as compared to unilateral cases.
Evaluation Of The Effects Of Quad Helix Appliance In Unilateral Cleft Lip And Palate Patients: A Fem Study

Abstract Authors : Dr Puneet Batra
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INTRODUCTION

Constricted maxilla and posterior crossbite are believed to be a result of surgical scar contraction following palatal repair. To address the problem of transverse discrepancy, expansion is required in most cleft cases. These expansion procedures are performed during mixed dentition or early adolescence, when mid palatal and other circum-maxillary sutures are still patent.

DESCRIPTION

The basic need for maxillary expansion in cleft patients comprises of: correction of collapsed arches, crossbites; to prepare the arches for alveolar bone growth; to improve airway dimensions; facilitate nasal expansion and to aid in maxillary protraction. Transverse discrepancies are corrected through a combination of skeletal (separation of the mid palatal suture) and dental expansion (lateral tipping of maxillary posteriors).

The quad helix appliance evolved from the Coffin loop incorporated in vulcanite plate which was introduced by Walter Coffin in 1869. It is made from 0.036 inch SS though Ricketts originally prescribed the use of 0.038 elgiloy as it facilitates intraoral adjustments.5 Since Quad helix appliance provides a better adaptation, greater comfort, economical and hygienic procedures involved are simple, it is one of the most commonly used appliances for transverse expansion of the maxilla in cleft cases.

Since Finite element modelling provides a three-dimensional graphical representation of biological structures invariant of reference points and reference lines, it is an ideal method to study the changes
CONCLUSIONS

Expansion procedures are very useful adjuncts for treatment of cleft patients. They allow better arch development, correction of interarch relation and preparation for future grafting procedures.

CLP Malocclusion Rating Systems

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There are several types of congenital craniofacial anomalies, most frequent of which are orofacial clefts that encompass the cleft lip and palate which occurs when embryonic facial processes fail to unite. Malocclusions associated with cleft lip and palate are crowding, rotations, malposition of teeth, aberrations of teeth. To access the severity of these malocclusions various indices are seen. In orthodontic context, an index is used to designate a rating or as a categorising system that assigns a numerical score or alphanumeric label to a person’s occlusion. Several indices are now available to assess these malocclusions in cleft lip and palate (CLP) patients like GOSLON Yardstick, 5-year-old index, EUROCRAN index, Huddart - Bodenham system, modified Huddart - Bodenham system, GOAL Yardstick and Bauru-Bilateral Cleft Lip and Palate Yardstick and although it has been quite some time since the introduction of these indices, there is no consensus as to which index should be used for Cleft Lip and Palate population. Our aim is to assess these available indices of categorising treatment effectiveness in patients with cleft lip and palate and to study there effect on improvement of treatment outcomes. The GOSLON yardstick
index is most commonly used index as unilateral cases are closely linked to jaw growth whereas EUROCRAN yardstick is a favourite because it can be used to evaluate the degree of malocclusion in both anteroposterior and vertical dimensions, and the modified Huddart - Bodenham performed the best according to the WHO criteria. This overview can create better awareness regarding the uses, advantages, and disadvantages of the different indices. Thus in orthodontics, the use of a combination of different types of indices appear to be beneficial and promising for clinicians in the selection of specific index for scoring the treatment outcome and enable the review of treatment options to ensure better patient care.

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Dental Rehabilitation Of Adult Unilateral Cleft Palate Patients: An Inter-Disciplinary Approach

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The common problems in unilateral cleft palate patients are transverse maxillary deficiency, missing teeth and alveolar bone defect in region of cleft. The orthodontic treatment of adult unilateral cleft palate patients involves maxillary expansion to correct transverse deficiency, alveolar bone grafting in cleft region to address bone loss and prosthodontic rehabilitation of missing teeth. The timing of rotation correction, supernumerary tooth extraction and maxillary canine alignment prior to alveolar grafting have been emphasized. The decision to close space across cleft region or provide dental prosthesis for missing teeth in unilateral cleft region are also discussed with case examples.

Introduction:

The common dental problems in unilateral cleft palate patients are the presence of transverse maxillary deficiency, missing teeth and alveolar bone defects. The multi-disciplinary role of a dentist (orthodontist, oral surgeon, prosthodontist) in the treatment of unilateral cleft palate patient
involves: firstly begin with maxillary expansion to address transverse deficiency; later prepare for alveolar bone grafting in cleft region to address bone loss; and finally rehabilitation of missing teeth with dental prosthesis.

Discussion:

The role of orthodontics before alveolar bone graft is crucial and consists of:

1) Do not correct rotated teeth (adjacent to the cleft) due to risk of dehiscence and fenestration;

2) Extract supernumerary teeth on the palatal side (of clefts) three months before alveolar bone grafting to provide adequate mucosal closure to cover the grafted region;

3) Maxillary canine alignment before alveolar bone grafting in unilateral cleft palate;
   - Maxillary canine position are ectopic or impacted in cleft region.
   - Canine that are leveled before grafting, have a good alveolar crest after grafting.
   - TMA cantilevers are used with a trans palatal arch;

The decision to close space across cleft region or prosthetic rehabilitation depends on three factors:

1. the maxillary canine position,
2. the degree of crowding, and
3. The inter-arch relation.

- The space closure is preferred when the canine erupts mesial to cleft area, with maxillary tooth crowding and Class II inter-arch relation on the cleft side.
- In patients with missing maxillary lateral incisor, the posterior teeth on the cleft side are mesialized to close spaces;
- The maxillary lateral incisor with a good root length are retained in the cleft area;
- In cases, where the canine erupts distal to the cleft, with Class I molar relation, with little or no maxillary arch crowding, rehabilitation with
dental implants/dental prostheses to replace missing teeth in cleft region.

- Dental implant requires space maintenance and are inserted after orthodontics.
- Dental implant in canine region help prevent bone loss at the grafted area.

Additional dental problems include,

1. Maxillary midline deviation
2. Crowding in the major segment is corrected by asymmetric extractions.
3. Extract (one premolar or lateral incisor) on the opposite side of the cleft. In cases of lateral incisor agenesis, extract the maxillary lateral incisor adjacent to the cleft to maintain dental symmetry and esthetics.

The treatment options available for patients with Class III inter-arch relation:

1) Consider mandibular extractions in patients with an occlusal scores of Goslon 3 and good facial esthetics.

2) Consider orthognathic surgery in patients with an occlusal scores of Goslon 4 and 5 or patients with Goslon 3 with poor facial esthetics. Le Fort I osteotomy for maxillary advancement would be ideal in mid-face deficiency. Maxillary incisors do not require orthodontic decompensation, but mandibular incisors require proclination prior to surgery.

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Expunge The Stigma – Don’t Accept It!!

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The range of facial deformities is enormous producing some degree of disfigurement and impairment of function. The most frequent congenital facial deformities are the cleft defects affecting 1 in every 500 to 1000 births worldwide. There are many techniques to repair the cleft defects and each has its advantages and limitations. The optimal time to create symmetry in a cleft lip is during the primary repair. However, secondary deformities like whistle deformity, enlargement and absence of depression in the philtrum, nasal deformity, straight lateral columns, absence or deformation of the cupid’s bow and philtrum landmarks, etc., are not uncommon and can leave a cleft stigma in the patient’s face. For functional, esthetical, and psychological reasons, a secondary correction is often requested. The purpose of this poster is to enlist various primary and secondary repair techniques of facial cleft deformities. Various primary repair techniques for the cleft lip include the methods given by Mulliken, Trott, Cutting, Mc Comb, and other techniques like bilateral straight line repairs, Milards rotation and advancement flaps, banked forked flap technique, prolabial unwinding flaps, triangular flap methods, quadrangular flaps, modified fork flap technique, etc. and the primary repair techniques for the cleft palate are the Sommerlads, Schwendiek, Werner Widmaier, Millards, Veau and Bernhard Von Langenback methods. Under secondary repair techniques, I will be discussing the treatment options for scars, secondary muscle discrepancies, philtrum contouring, cupids bow construction, vermilion repair, repair of the upper labial sulcus, lengthening of the columella, and nasal reconstruction etc. and the techniques discussed are the lip revision, grafts, pharyngoplasty, palatoplasty, rhinoplasty, Abbe flaps, Orthognathic surgery, etc. We must recognize that each patient mandates an individualized approach and attempt to incorporate the best treatment option available for him.

“Just because you are born with it, you don’t have to live with it”

Sprouting In Clovens

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ABSTRACT FOR POSTER
Cleft lip and palate patients may show a deficiency of soft tissues, insufficient bone support, deficient sagittal maxillary growth and transverse collapse of the upper jaw and a vertically short midface. The permanent teeth above the alveolar cleft are not sustainable if there is not adequate bone stock placed in the alveolar cleft into which they can erupt. So, Alveolar Bone Grafting is done to close the oronasal communication, support the soft tissues, restore the alveolar ridge, allow spontaneous eruption of the canine, and avoid prosthetic reconstruction. Three main types of bone graft exist, depending on the time of insertion: primary, secondary, and tertiary bone grafts. Primary bone graft patients receive a graft prior to first year of birth. Early secondary bone graft patients are grafted before eruption of the canine. Late secondary bone graft patients receive a graft after eruption of the canine. Tertiary bone graft patients receive a graft in adulthood, often in combination with an osteotomy of the maxilla. The timing of alveolar bone grafting relies heavily on tooth development. Early secondary bone grafting is preferred because 80% of the bone reaches a normal level and the canine takes a good position in occlusion. Adding viable bone is one of the primary goal, and an understanding of dental anomalies associated with cleft alveolus is important because an orthodontist may require additional interventions such as tooth removal at the time of grafting or orthodontic traction for impacted or unerupted teeth. Staged bone grafting should take place after the soft tissue defect has been reconstructed. Autogenous cancellous bone from iliac crest is used as ideal graft. Bone from the mandibular symphysis or tibia can also be used. The bone substitutes such as bone morphogenic protein is an alternative to bone grafting.

Reclaiming Old With New: Nam With Dynacleft And Nasal Elevator System

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INTRODUCTION

In 1993, Grayson et al described a new technique to presurgically mould the lip, alveolus and nose in infants born with cleft lip and palate (CLP). When the infant is less than 6 weeks of age the nasal cartilage can be moulded due to increased plasticity because of maternal oestrogen, which makes it easy for the tissues to be well aligned before primary surgery, enabling the surgeon to achieve a better and more predictable outcome with less scar tissue formation.

DESCRIPTION

With time new noninvasive methods of nasoalveolar moulding has come up one of which is DynaCleft with Nasal Elevator System, this gently guides bone and soft tissue while supporting nasal alar cartilage, improves nasal symmetry, expands and contracts soft tissue as baby’s mouth moves and better positions the cleft lip and palate for optimal surgical results. Advantage of this method over the conventional method is that it is easy to apply and manage, increasing parental compliance with treatment, easy for parents to manage at home minimizing the clinical visits with no professional adjustments necessary. It maximizes the comfort for baby unlike the conventional method of NAM and also does not interfere with feeding. Dynacleft and Nasal Elevator thus shows a lot of promise to be a new way towards a new non-invasive method of nasoalveolar molding.

CONCLUSION

Hence the need of the hour is a new method of NAM which is as efficient as the conventional method and patient friendly where DynaCleft and Nasal Elevator comes into picture without compromising on the basic functionality of Nasoalveolar molding.

Cleft Rehabilitation – Unique Situations – Simplified Solutions

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The basic orthodontic principles and procedures followed for rehabilitation of cleft lip and palate patients are well established and routinely practiced.
These give fairly good and predictable results particularly when there is full complement of teeth present. Some patients present with unique problems, which call for out of the box planning and treatment procedures.

The author would present some such cases namely patients with missing teeth, aberrantly erupted teeth or when procedures like Alveolar Bone Grafting do not give the desired results. The clinical cases will also include pre alveolar bone grafting orthodontics and various appliances used for stabilisation of cleft arches for alveolar bone grafting, and specific indications of different types of stabilising appliances. And also the clinical cases where with the post alveolar bone orthodontics, implant site preparation has been done for the final rehabilitation of cleft patients.

The basic principles followed, the modifications introduced keeping in mind the soft tissue paradigm to get the best of aesthetics (Macro, Mini &Micro) would be discussed.

Where Are We Today As Cleft Orthodontists And What Lies In The Future

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Cleft Orthodontics is at crossroads. While several treatment protocol updates and outcome assessment reports have streamlined the pathway for cleft orthodontics, one can’t help to notice there are still certain gaps either in planning or outcome reporting. The long term of benefits of presurgical infant orthopedics is still inconclusive. The use of facemask therapy to protract the maxilla in cleft patients with the concurrent use of the Rapid maxillary expander (RME) has become a common practice (Alt-RAMEC). Also the advent and advancement of temporary anchorage devices have certainly widened the envelope of treatment that can be administered especially in cleft palate care where it has a plethora of applications from aligning the cleft and premaxilla segments to anchoring the distraction devices not to mention the absolute anchorage it renders for complex tooth movement. Bioink- based three-dimesional (3D) bioprinting technologies are being employed to engineer experimental models of tissue and organ substitutes. Leading research groups are focusing on four-
dimensional (4D) bioprinting as an enhanced approach for tissue engineering and regenerative medicine. Additionally, the recent usage of sub-cutaneous platelet rich plasma (PRP) has demonstrated not only faster movement but also an increase in the alveolar bone volume as well. The use of Low intensity pulsed ultrasound stimulation (LIPUS) to increase rate of tooth movement along with increasing the rate of remodeling in fracture/distraction sites also seems to be an interesting avenue which could be of meritorious use in cleft orthodontics.

**Pre-Surgical Nasoalveolar Molding : A Valuable Tool In The Management Of Cleft-Lip-Nose Deformity In Cases Of Complete Bilateral Cleft Lip And Palates - A 5 Year Follow-Up**

Dr. Renu Parmar, Dr. Krishnamurthy Bonanthaya, Dr. Pritam Shetty

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Bilateral cleft lip-nose deformity is a complex problem which requires multiple stages of treatment for a satisfactory outcome. It is a multifactorial problem, if not attended adequately during the primary surgeries it may tend to aggravate further with growth and development of the nose, making it a 4-dimensional problem.

The initial challenge faced during reconstruction of a bilateral complete cleft lip is a protrusive premaxilla and the difficulty of achieving adequate columellar length and vertical height to the lip. The severity of the primary naso-labial deformity is generally proportional to the severity of the cleft. The more extensive the cleft and greater the protrusion of the premaxilla, the worse is the nasal deformity. Asymmetry of the nasal deformity and the premaxilla may present a challenge to the operating surgeon as it adds to the complexity of the overall reconstruction by creating asymmetric forces on each side of the constructed lip and nose which leads to healing under a lot of tension and thus, can lead to abundant scarring.
Primary nasal deformity correction is undertaken to ensure balanced growth, better development of the nasal structures, thereby creating better conditions for a definitive cleft rhinoplasty.

The goals of primary bilateral cleft lip nose repair are; closure of the nasal floor and sill, lengthening of the columella, repositioning of the alar base, achieving nasal tip projection, repositioning of the lower lateral cartilages, and reorienting the nares from horizontal to oblique position. However, early extensive surgical intervention on cartilages may adversely affect growth and development of the nose in particular and the mid-face in general; at the same time, allowing the cartilage to grow in an abnormal position would contribute to aggravation of the existing deformity. Hence, the significance of presurgical naso-alveolar molding (PNAM), which is a non-surgical nasal and alveolar molding technique which utilizes the biochemical and physiological potential of nasal cartilages to get molded in the neonatal period. All the goals of a primary rhinoplasty except for the closure of the nasal floor and sill can be adequately achieved by PNAM.

The objective of this paper is to demonstrate the significance and outcome of PNAM in CBCLP and their 5 year outcome in a series of cases treated at our unit between Feb 2012 to Jan 2013.

Key words – Cleft naso-labial deformity, Columella, Pre-surgical naso-alveolar molding

Marketing And Financial Management Of Cleft Orthodontics.

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Orthodontic support is of great help to the cleft teams and the cleft patients. We now have a large number of fresh graduate Orthodontist, who can be motivated to be part of cleft care, both at Institution level and in their private setups.
The presentation highlights the benefits of including the Cleft patients in the Orthodontic private practice. By having a structured system of appointment schedules and treatment stages, the patient and the Orthodontist can both optimise the treatment visits, duration and the costs.

The financial aspect of Cleft Orthodontics is presented with the detailed breakdown of the appointments, appliances and the cost to the clinic when we embark on the journey of cleft care.

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**Predictors Of Velopharyngeal Insufficiency In Cleft Palate Orthognathic Surgery**

Dr. Swati Acharya, Dr. Satyabrata Patnaik
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Cleft deformities of the lip and palate create a challenge for orthodontists and healthcare professionals who treat these patients. A team approach is required for optimal care. End-stage reconstruction can be very complex, requiring precise surgical techniques to maintain viability of the maxilla and to achieve optimal functional and aesthetic outcomes. The influence of cleft type on velopharyngeal function is limited to young patients. For those who have missed the best surgical timing, appropriate delay of operation age is reasonable, especially for patients with complete cleft palate. When proper care is rendered to patients with deformities associated with clefts of the lip and palate, optimal functional and aesthetic results can be achieved, allowing these individuals to live relatively normal lives. Velopharyngeal dysfunction after maxillary advancement in Lefort I osteotomy may be a result of velopharyngeal insufficiency in these patients. Assessment of airway and compensatory changes of velopharynx is important for a precise outcome of treatment by an orthodontist. They are significant to give a clear picture of velopharynx pre and post surgery with the knowledge of correlation between degree of maxillary advancement and deterioration of velopharynx. This topic details the anatomy, physiology of velopharynx, methods to evaluate the changes in upper airway and assessment of speech with good accuracy.
Treating The Crouzon’s Syndrome: Holistic Approach To Enhance Dentofacial

SP Singh, Oral Health Sciences Center, PGIMER, Chandigarh, India

Abstract:

Crouzon’s Syndrome, a genetic disorder that affect 1 among 25000 live birth is the most common craniosynostosis, which was first describe by a French neurologist Octave Crouzon in 1912. The most obvious skeletal deformities associated with this syndrome are frontal bossing and naso-maxillary hypoplasia and proptosis. The underlying skeletal deformity is camouflaged by maxillary and mandibular dentition by the natural compensation in all three planes of space. It is therefore absolute necessary to remove all the natural compensation, so that actual underlying skeletal deformity is reflected. The role of orthodontist lies in the diagnosis and treatment planning to remove the de-compensations in pre-surgical phase of orthodontics and later on to plan the actual amount of surgical correction needed to match the maxillary and mandibular dysplasia. This presentation would be focused to highlight the orthodontic and other discipline working in unison under a single umbrella to comprehensively manage the patients with Crouzon’s syndrome to serve them in better way.

Orthodontic Principles In The Management Of Hemifacial Microsomaia

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Hemifacial Microsomaia is the Second most common anomaly of the Craniofacial anomalies after the Cleft of the Lip and Palate. The anomaly is predominantly under the care of the Plastic surgeons with the ear reconstruction and the condylar head replacement to achieve an aesthetic and functional result for the patients.
Orthodontic treatment principles involve the growth modulation of the affected side of the mandible with balancing of the Occlusal plane, use of fixed appliances for alignment of the arches, levelling of the bite and preparation of the arches in cases of Bi-Jaw surgery to correct the vertical symmetry of the face.

The presentation highlights the use of various Orthodontic components which play a role in the planning and treatment of the Hemifacial Microsomia both in the growing years of the patient and the surgical correction of the deficient vertical side of the ramus and the condylar area.

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**Morphological Assessment Of Maxillofacial Structures In Adult Cleft Maxilla Cases With Unilateral Cleft Lip And Palate Disorder**

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**Background and objective:**

The facial morphology is being influenced by the three factors in cleft cases seen after the growth has completed: iatrogenic factors, intrinsic deficiency factors, functional distortions affecting position and relative growth. Though multiple procedures are taken up to normalise the growth and development, the stigma of the cleft facies persists, in the backdrop of a hypoplastic maxilla. This demands a surgical aesthetic correction. However, the focus has been on addressing the maxillary component of the defect and a net proportional impact of mandible can be left out.

**Method:**

Cephalometric x-ray cross sectional study was carried out for 124 adults (84 males, 40 females) diagnosed with unilateral cleft lip and palate to assess the proportional balance and correlation with natural compensation in structure.
Results:

Many subjects showed an intrinsic maxillary retrusion (94%) and a steeper mandible. Positive correlation and increased specificity to the presence of large chin was found in all the cases. Presence of normal to large size mandible was observed in 68% of the cases. Airway assessment showed close correlation between mandibular size and spatial orientation with pharyngeal space at the level of hyoid. No correlation was observed for the relation with mandibular ramal width and overall spatial orientation and jaw dimensions.

Conclusion:

Within the limitation of the study, with the present sample of subjects, it can be concluded that, Intrinsic genetic deficiencies have a detrimental effect on maxilla sagittal length, resulting in deficient maxilla in the majority (94.8%) of the cases. Individual morphological assessment and planning of both upper and lower jaw are essential in all the cases, with due emphasis on adjunctive surgical procedures viz. genioplasty. The surgical plan must be evaluated to best achieve the facial balance with restoration of aesthetic curvature.

Changes In Facial Soft Tissues In Cleft Lip And Palate Patients By Growth Modulation Using Orthopaedic Forces

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AIM

The aim of this study is to analyse the changes in facial soft tissues for cleft lip and palate patients while using face mask and rapid maxillary expansion to modulate the growth of hypoplastic maxilla in growing children.

MATERIAL AND METHODS
Patients with hypoplastic maxilla between age 8 and 12 years previously operated for cleft lip and palate were treated with petit type of face mask and rapid maxillary expansion. Analysis of cheek bone contour, nasolabial angle, lip competency, procumbency were done, 1 year after face mask protraction.

RESULTS

The cheek bone contour improved for all the patients after face mask therapy. The lip competency and nasolabial angle improved after the face mask protraction. The lip and mentalis strain decreased for the patients after face mask protraction.

Expanding The Cleft Palate- Why, When & How To Do

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Saveetha Dental College & Hospitals
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ABSTRACT:
In Cleft lip & palate there is a deficiency in the development of maxilla in all three planes due to the scarring caused by the primary cleft palate surgery. The transverse correction of maxilla (maxillary expansion) takes precedence over the vertical & antero-posterior correction of maxilla. Also, there has been a lot of debate over the timing of the expansion. To do expansion before Secondary Alveolar Bone Grafting (SABG) or after bone grafting. According to the author the purpose of expansion done before SABG is different to the purpose of expansion when done after SABG. It is very vital as to understand the purpose at each stage & to select the appropriate expansion appliance & do expansion accordingly. Finally, what are the various appliances which were & are used for expansion. Their advantages & disadvantages. The controversy between Rapid palatal expansion or Slow expansion in cleft palate patients. The protocol which has been used in the author’s cleft centre. The introduction of new method of expansion for the very first time- “THE JOCKEY WIRE EXPANSION”
Secondary Alveolar Bone Grafting: How Much Can The Radiographs Predict?

Dr O.P. Kharbanda, Dr Sharmistha Bhattacharyya (presenting author), Dr Ashoo Grover, Dr R.S. Dhaliwal, Dr Maneesh Singhal

Purpose. To compare the results of secondary alveolar bone grafts using 3 different radiographic scales and their relative reproducibility in predicting the rate of canine eruption through the newly formed bone.

Materials and Methods. We analyzed pre and postoperative radiographs of 25 patients for the amount of bone in the cleft site according to the Bergland, Kindelan and Chelsea scales. We further evaluated the application of these scales for their applications in mixed and permanent dentitions. The associations between the variables and the correlation between the scales were measured. Kappa statistics were used to measure the agreement between repeated assessments by the same observers at different time points, for each of the three assessors and for each of the three radiographic scales.

Results. Because autogenous bone grafts of types I and II from the Bergland scale and types A and C from the Chelsea scale were considered satisfactory, the success rates of autogenous bone grafts were 84.6% and 80.7%, respectively and that for Kindelan scale was 83.4% with the majority falling in grade 1. A positive correlation between the scales was observed. Bone grafts performed before canine eruption achieved more satisfactory results.

Conclusions:

1. Our results suggest that all radiographic scales are important tools for the evaluation of bone grafts however none showed superior reproducibility over the other two.

2. Reproducibility is better when done in mixed dentition state than when done in permanent dentition state.

3. The results of SABG in our series compared favourably with other published data.
Orthopedic Management Of Hypoplastic Maxilla – Poster

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One of the common finding in a cleft patient is the hypoplasia of the maxilla. The challenge involves conservative management of the maxilla during the growing phase. Conventional approach would involve expanding the maxilla using maxillary expanders and protraction of the maxilla using reverse pull headgears. However the reverse pull headgear has compliance issues from the patient. Alternative treatment plans would be to apply intraoral protraction springs which can be used in a non compliant patient to effectively protract hypoplastic maxilla. The protraction spring is made up of TMA wire. However the success of this procedure involves the most important step of opening the circum maxillary sutures. Expansion of maxilla can be done by expanders like Hyrax or Hass type or double hinged expander. Protraction spring is an intraoral device that delivers reasonable amount of orthopedic force for maxillary protraction. The protraction spring acts by converting the biting force into anterior component of force which protracts the maxilla.

Traumatic Fracture Of Premaxilla In Bilateral Cleft Lip And Palate Patient

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Cleft lip and palate is the second most frequent major congenital anomaly (1:750 to 1:1,000 live births). Failure of the premaxillary segment to fuse with the lateral maxillary segments results in a complete bilateral cleft of the lip. Subsequent forward growth of the premaxilla, attached only to the vomer above, leads to its projection beyond the lateral segments. Complete bilateral cleft lip and palate (BCLP) patients show a characteristic anterior projection of the premaxilla which often persists even after lip repair. This anterior projection of premaxilla make it more to prone to trauma.

A 3-year-old boy with repaired bilateral Cleft Lip and palate reported after suffering a fall while playing. Upon investigation it was found that premaxilla was fractured and displaced. Open reduction of premaxilla and vomer was done followed by fixation.

According to authors’ humble knowledge there has not been many cases reported of management of a traumatic fracture and displacement of the premaxilla.

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In Cleft palate cases, major indications for alveolar reconstruction are maxillary discontinuity, lack of adequate alveolar bone and oronasal fistulas. A surgeon’s biggest challenge is to adequately create a three-dimensional soft tissue envelope. Treating untreated alveolar clefts in patients above 8 years is difficult, as teeth are poorly aligned and partially erupted, also salivary and bacterial contamination, could lead to Partial or total graft failure. Distraction osteogenesis, a surgical technique developed by Ilizarov based on principle of “tension-stress” allows bone and soft
tissue lengthening through progressively controlled fracture separation, it plays a role in deficiency situations like grafts with high failure rate. Based on same principle, reconstruction of mandible was demonstrated by pioneering work of Costantino et al. The aim of this poster is to represent **Interdental Transport distraction osteogenesis (TDO)**, a technique described by *Liou (2000)*, now in vogue, as treatment choice for cleft palate repair with excellent functional and esthetic outcomes. TDO is achieved by incremental movement of viable alveolar bone segments across a defect, in a planned direction along the curve of dental arch using a boneborne distractor in combination with an orthodontic arch wire for guidance. Designs described by various authors will be depicted in this poster. TDO aids in progressive improvement with excellent physiological adaptation, decrease in size of the cleft and regeneration of its soft tissues. Advantages being: No need for large bone grafts involving donor site, minimal surgical time, bone height and width are similar to the neighboring alveolus with excellent dental implant possibilities, and a natural reconstruction that aids with final tooth movement. The metabolic activity also augments the local blood supply, stem cells, and nutrients. Finally, the morbidity is minimal. The disadvantages are few; less flexibility of vector control and a smaller amount of advancement, requires patient cooperation and close follow-up.

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**Nickel Titanium Expander**

Dr. Akhil ajay  
Institute of dental studies and technologies, modinagar

**INTRODUCTION**

Maxillary arch discrepancy in the transverse plane has been recognized from thousands of years. Timely treatment of such maxillary transverse discrepancies by means of maxillary expansion is recommended to reestablish optimal function in order to normalize dental, skeletal, and neuromuscular growth. Moreover, regarding the increasing tendency towards use of non-extraction treatments, expansion may be a solution for the space deficiency. Pertinent maxillary expansion appliances were devised to expand the constricted maxilla. Since their introduction in 1860s, they have been gaining more and more popularity in the
orthodontic community. In 1997, Maurice C Corbett introduced the ‘Nitanium Palatal Expander 2’, that delivers a uniform slow continuous force for maxillary expansion, molar rotation and distalization, and arch development.

**DESCRIPTION:**

The appliance expands at a rate that maintains tissue integrity during repositioning and remodeling of the teeth and bone. Its unique shape memory quality and specific thermal transition temperature proves it fruitful.

**CONCLUSION:**

This poster provides a brief insight over the design, selection criteria, preparation and placement and the advantages of NPE2 appliance.

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**Our Trail With Nam In A Busy Center**

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NAM is a boon to facilitate the surgical repair in infant with cleft lip and palate

We chose about 10 children, age was as early as possible.

Advantages: Early correction of nasal floor, better lip symmetry, alveolar realining and better cosmesis.

Disadvantage: Its difficult to teach parents who are not well educated. Intial feeding is a problem. Regular visits to center is difficult for parents from distant.

Conclusion: The results were very encouraging for the symmetry of the lips and the nasal floors but we did not get the favourable result for the nasal alar correction
Short Term Intensive Speech Therapy Program Focusing On Correction Of Errors In Articulation In Individuals With Clp- A Preliminary Report

Jeba Renita.J, Subramaniyan B, Vijay Kumar.k & Roopa Nagarajan
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The aim of this study is to document the effect of a short term speech therapy program focusing on correction of articulation. The study included 20 participants (5-30 years) with non syndromic repaired cleft of lip and palate. Each participant attended 8 to 10 sessions of therapy with minimum 2 sessions of therapy per day for a period of one week at a tertiary care center. The speech therapy sessions involved demonstrating techniques such as elimination of glottal stops, passive air flow phonetic placement and visual, auditory, tactile feedback was provided. The speech sample were recorded pre and post speech therapy program using audio and video recorder. Pre and post speech recordings were analysed by three SLPS with a minimum of 03 years of clinical experience in assessment of cleft speech. Interrater reliability measures and pre post speech data were subjected for statistical analysis. The result revealed that there were changes in speech of the individuals with cleft lip and palate after the short term speech therapy program in terms identifying the correct place of articulation, awareness of correct and incorrect production, and production of the target sounds. Initial findings from this clinical experience highlights the need to follow up the immediate, long-term impact of short term speech therapy program. This preliminary report will also highlight the methodological challenges which has to be considered while implementing and reporting outcomes.

Velopharyngeal Function And Speech Characteristics In Children Following Early Cleft Palate Repair :
Preliminary Results
Optimum speech outcome and velopharyngeal function in children with repaired cleft palate depends on various factors including the timing of palatal repair, the technique used and the surgeon’s experience. Though perceptual speech assessment usually helps in determining the efficacy of primary palate repair, direct observation of the structure and function of velum gives information which helps in refining further palatal repairs. The aim of the study was to investigate speech characteristics and velopharyngeal function in children following early (<2yrs of age) primary cleft palate repair. Objectives of the study was to measure the velopharyngeal function using videofluoroscopy, speech characteristics in terms of resonance parameters (hypernasality & nasal air emission) cleft type speech errors and speech understandability. 20 children in the age range of 5-8 years undergone early cleft palate repair in the same center were considered as participants for the study. All the participants were subjected to videofluoroscopic assessment (VFS) and perceptual speech assessment by experienced speech pathologist. The videofluoroscopic parameters measured were resting gap, velar excursion and closure ratio to establish the severity of VPD. Resonance parameters and speech understandability were measured using severity rating scales. Cleft type speech errors were identified through perceptual assessment. Inter and intrarater reliability was established. The results indicated that 45% of children had efficient VP function in VFS with complete or efficient velopharyngeal closure. Resting gap ranged from 2mm to 7.5mm which is considered optimum for efficient velar closure. 55% of children had perceptually normal resonance and speech understandability. Glottal substitution was the predominant cleft type error observed. Hypernasality and nasal air emission was found to be good predictors of velopharyngeal function. The study provides insight into the nature of speech deficit and underlying structural deficits persisting in children following early
palatoplasty. Data on larger population is warranted for establishing predictors for optimum speech outcome.

Outcomes Of Speech Language And Hearing Status In Individuals With Cleft Lip And Palate Identified In Two Rural Districts Of Tamil Nadu 2015 To 2017

Akilan Rajendran, Subramaniyan.B, Prof.Roopa Nagarajan
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Abstract:

In the ongoing community based project, comprehensive management of communication disorders in individuals with cleft lip and palate (CLP) are provided at Thiruvannamalai & Cuddalore districts of Tamil Nadu. Activities of the project include identification of individuals with CLP in the community, screening for surgery, speech, language & hearing screening/assessment, speech correction program delivered by CBRWs under the supervision of SLP. Multidisciplinary clinics consultation at the tertiary hospital includes, hearing assessment, VPD assessment, IQ assessment and other medical/dental consults. This study aims to profile the outcomes of the 5th phase of project (2015 to 2017). During this phase of the project 114 (62 males and 52 females) individuals were identified. This paper will profile the needs of the patients enrolled in this time period and meeting the needs related to speech & language intervention, hearing & otological intervention, surgical correction for speech. This paper will also highlight the follow up rate for intervention and report the challenges reported for loss to followup.
Comparison Of Perceptual Nasal Resonance Using An Ordinal Scale And Visual Analog Scale By Trained And Untrained Listeners

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Management of resonance errors in individuals with CLP is an important goal in speech therapy. Perceptual analysis of resonance plays an important role in planning of further intervention. This study compares the perceptual evaluation of nasal resonance using an ordinal scale (Universal reporting parameter) with visual analog scale by trained (Listeners with minimum three years of experience in the field of CLP management) and untrained listeners (listeners who have theoretical knowledge on CLP; however are not actively involved in the CLP management). All six participants rated resonance of 20 speech samples of varying degree of nasality randomly picked from the database. These samples were rated using an ordinal scale and VAS (10 cm line, blindfolded as 0 – Normal, 0.1 – 3.3 as mild, 3.4 – 6.6 – moderate and 6.7 – 10 – severe hypernasality). The results will be tabulated and compared to derive to a closest agreement between trained and untrained listener using ordinal and VAS for resonance. The results of the study highlights the reliability judgments while using two tools in estimating the magnitude of resonance.

Psychosocial Impact Of Velopharyngeal Insufficiency In Individuals With Cleft Lip And Palate

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Velopharyngeal insufficiency (VPI) affects speech, swallowing and many psychosocial aspects of life (Skirko et al, 2013). Objective measurements do not evaluate the psychosocial impact of a voice disorder. VELO (Velopharyngeal Insufficiency (VPI) Effects on Life Outcomes) instrument measures the patient-centred outcomes in children with VPI (Skirko et al, 2013).

**OBJECTIVE:** To evaluate the impact of VPI with CLP in the lives of children with cleft lip and palate.

**METHOD:** VELO scores and sub-scores were analysed in 30 individuals with VPI between 5-15 years of age. Participants were competent Hindi speakers and underwent speech evaluation. The severity of hypernasality was mild, moderate, and severe based on the universal parameters for reporting speech outcomes in individuals with cleft palate.

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**Speech Sound Development In Children With Cleft Lip And Palate**

Dr. Savitha V H, Bangalore.

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**Nasality Measurements: A Comparitive Study Of Online And Offline Assessments**


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Poster Presentation

Reliability in perceptual assessments is still a topic often debated. In the evaluation of resonance, the agreement in nasality judgements are variable. In current practice, audio-video recordings are used for offline assessment and documentation of speech samples. Hence it is important to investigate if measurable differences exist in offline and online modes of assessment. This study assessed inter-rater and intra-rater agreement levels for nasality ratings in online and offline assessment (Video recording) in individuals with CLP. Ten Tamil speaking individuals with repaired CLP above 8 years of age, who reported to the clinic during the study period served as participants. The listeners were 3 SLPs with a minimum of 03 years of clinical experience in assessment of speech in individuals with CLP. Connected speech sample was used for the assessment process. Protocol used for recording of speech sample in cleft and craniofacial centre was followed. Participants were primed about the procedure and their consent was obtained. The listeners were blind to the demographics and previous history of the participants. Speech was evaluated by the listeners during the audio video recording session and they rated nasality using the universal parameters for reporting speech outcomes. The recorded A/V sample was played to the listeners in a random order through independent listening station two weeks after online ratings of nasality. Inter/intra-rater scores were measured for both assessment modes. The agreement levels were calculated using the Kappa tool. The results of the preliminary findings highlights the methodological challenges.

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Evaluation And Intervention Of Speech In An Individual With Noonans Syndrome- A Single Case Report

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Noonan syndrome is an autosomal dominant congenital genetic condition characterized by distinctive facial features, short stature, chest deformity, congenital heart diseases and other comorbidities. This case report highlights the decision-making process and intervention provided for an adult with syndromic (noonans syndrome) repaired cleft of secondary palate. Multidisciplinary team was involved in the assessment and management process. The physical examination revealed significant features associated with the syndrome like pectus extavatum, low set ears, ptosis. Intraoral examination revealed restricted tongue movement and micrognathia. The client is also diagnosed to have pulmonary valve stenosis with bleeding diathesis and coagulation abnormalities. Detailed speech evaluation was carried out and audio, video speech recording was done. Nasoendoscopic evaluation was scheduled in order to evaluate the degree of severity of the velopharyngeal dysfunction. The results revealed moderate defect in velopharyngeal function. The client was recommended to attend speech therapy focusing on improving the articulatory skills. The client attended 10 speech therapy sessions, which involved demonstrating techniques such as phonetic placement and visual, auditory, tactile feedback was provided. The patient demonstrated improvement in articulation for pressure consonants. This case study highlights i) Importance of speech intervention program when surgical option is postponed due to medical reasons ii) Outcomes of a short term intensive speech program.

Impact Of Timing Of Palatal Repair On Resonance, Understandability And Acceptability In Children With Repaired Cleft Lip And Palate

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Cleft lip and palate (CLP) is one of the most common congenital birth defects in India characterized by abnormalities in oral resonance, nasal air emission and presence of compensatory articulation errors which affect the intelligibility of speech. Children with CLP require early surgical intervention to establish appropriate oral motor skills that is adequate for normal speech production. Early intervention plays an important role in enhancing the communication skills in children with CLP. Hence perceptual judgement of speech parameters is necessary to measure the speech outcomes and to determine appropriate treatment plans. Thus the present study aims at exploring the impact of timing of surgery on speech parameters. The study involved 16 Kannada speaking children with repaired cleft palate in the age range of 6 to 12 years and was divided into Early Intervention Group and Delayed Intervention Group. The stimuli considered were 10 meaningful words and 10 oral sentences, both loaded with pressure consonants in Kannada Language. Responses were collected and were given to perceptual rating using Henningsson’s rating scale by three experienced speech language pathologists. The results revealed that the mean scores of resonance, understandability and acceptability of children in early intervention group was comparatively higher than the mean scores of children in late intervention group in both words as well as sentences but it was statistically significant only in resonance. The present study concludes that early surgical intervention has a direct impact in reducing hypernasality in children with RCLP.

**Keywords** - Repaired Cleft Lip and Palate, early intervention, resonance, speech understandability and speech acceptability

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**Presentation: Poster Presentation**

**Topic:** Alar Defect And Reconstruction With Nasolabial Flap

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Defects of the nasal ala are rare and reconstruction is challenging due to the reduced mobility and thickness of the alar skin. Defects can be congenital, iatrogenic following tumour excision, or post-trauma. The natural arc of the ala and its boundary with the cheek are difficult features to reproduce. Reconstruction of the ala depends upon the thickness, extent, and location of the defect over the ala. We present the reconstruction of the full thickness nasal alar defect with the use of superiorly based nasolabial flap in 5 cases. Defects were congenital in two and post-trauma in the rest. The flaps survived in all cases with excellent aesthetic outcomes. The donor scar was well hidden in the nasolabial crease. This flap is easy to learn, execute and gives an excellent colour match to alar defect.

Type Of Presentation: Poster Presentation

Karthik S, Op Kharbanda
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Title: Quantitative assessment of bone thickness at infrazygomatic crest area for placement of orthodontic bone anchors in cleft lip and palate patients using CBCT

Orthodontic bone anchors comprise mainly of the miniplates, mini-implants and palatal implants which are used in cases that demand absolute anchorage. It overcomes the limitation associated with conventional anchorage methods. Miniplates placed in the infrazygomatic crest area would help to perform maxillary protraction, a wide range of orthodontic tooth movements and can be used in cases having insufficient tooth borne anchorage. Miniplates are found to have relatively high success rates. The bone thickness and density are important factors for attaining primary stability and influence the success rate of bone anchors. Miniplate for maxillary protraction is placed just in front of and parallel to the infrazygomatic crest that usually requires a surgical procedure. The anatomic limitations encountered during placement include the close proximity to the lateral wall of maxillary sinus and the root tip of permanent molars. Hence it is necessary to evaluate the bone thickness.
prior to the placement of miniplates. Considering these factors, a retrospective study was planned to evaluate the bone thickness at infrrazygomatic crest area in patients with cleft lip and palate using CBCT. The sample consisted of 20 (Male: 12, Female: 8) surgically operated unilateral cleft lip and palate (UCLP) patients. The mean age group of patients was 11.45 years. Measurements were made using Dolphin imaging software (Version 11.9 Premium). The bone thickness at the infrazygomatic crest area was measured in the multiplanar view at different levels with the reference being the distobuccal root of permanent molars. The bone thickness measurements will be compared with the cleft and non-cleft side. A suitable statistical test will be applied and reported accordingly.

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**Velopharyngeal Seal – The Anatomic Enigma**

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The activities of swallowing and speaking depend upon the ability to obtain adequate closure of the velopharyngeal port and obtain a seal called as velopharyngeal seal. It includes the velum (soft palate), lateral pharyngeal and posterior pharyngeal walls. Closure is accomplished by retraction and elevation of the soft palate and movement of the lateral and posterior pharyngeal walls. Proper velopharyngeal closure depends on several velopharyngeal muscles. Four distinct patterns of closure of velopharyngeal seal are: - coronal, sagittal, circular and circular with passavants pad.

Velopharyngeal deficits may result from- Congenital malformations such as cleft palate, Developmental aberrations such as a short hard or soft palate or a deep nasopharynx, acquired neurological deficits or surgical resection of neo-plastic disease.

In patients with clefts of the palate, abnormal muscle insertion are present which can effect the mobility of velopharyngeal valve which leads to
inadequate closure of the velopharyngeal port and thus creates velopharyngeal insufficiency. A cleft palate poses serious threats to speech development. In spite of surgical closure of the palate, many children remain unable to create adequate intraoral pressure for normal speech. This leads to problems like hypernasality, nasal air emission and feeding problems in these patients.

It can usually be eliminated with prosthetic and/or surgical treatment to obturate the site of air leakage. The choice of surgical procedure depends on the different closure patterns of the velopharyngeal mechanism.

Improving our understanding of the anatomy and physiology of the velopharyngeal mechanism can result in a positive impact on the treatment of individuals with abnormal velopharyngeal mechanism, such as those with cleft palate.

Comparative Analysis Between Amd & Conventional Orthognathic Surgery In Cleft Maxillary Hypoplasia

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Introduction:

There is consensus in agreement that the cleft hypoplastic maxilla is a consequence of primary surgery. However the cleft maxilla is difficult to mobilize due to the scarred palate thereby increasing the rate of relapse. In the last few years distraction osteogenesis (DO) has gained importance in the treatment of cleft maxilla which has proved to be an effective method for bone regeneration, hence more stability and fewer relapse rates. Anterior maxillary distraction (AMD) is a simple and easy alternative to conventional orthognathic surgery (CO) and conventional DO which is based on tooth borne device. The result in our series shows that it has better stability compared to CO.

Materials and Methods:

Group 1 patients (15) underwent conventional orthognathic surgery and Group 2 patients (15) underwent anterior maxillary distraction. All
patients underwent standard surgical assessment, cephalometric analysis measuring the distance between ANS and PNS & dental model surgery. In gr 1 and gr 2 patient's lateral cephalogram was repeated on the 3rd post-operative day to determine the amount of advancement (ANS-PNS) and then repeated at 6 months and 12 months respectively

**Results:**

The p value of <0.0005 of the relapse value was found to be statistically very significant indicating a significant difference in relapse between the 2 groups. The p value of <0.0005 of the difference in soft tissue profile was also found to be very significant indicating a significant profile change between the 2 groups.

**Conclusion:**

The relapse rate in AMD was found to be much lesser as compared to CO and hence more stability. The soft tissue changes in AMD were more promising making the concave profile convex, normalizing the nasolabial angle and making the upper lip more prominent thereby improving the lip esthetics and minimizing the residual deformity and the stigma of the cleft.

**Smile Analysis In Surgically Treated UCLP Subjects**

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A good smile besides enhancing face value is also an important component of facial expression. It requires detailed attention in treatment planning and surgical procedures of UCLP subjects, keeping symmetry in mind.

Here is a novel method of systematically capturing a smile in a reliable, repeatable way and analyzing it in a custom built software followed by scrutinizing it using a newly proposed smile diagram.

This study compares the components of smile, between repaired CUCLP subjects and normal subjects.
Retention In Cleft Orthodontics. Where Are We Now?

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Retention and stability are fundamental considerations to be taken into account at the start of any phase of orthodontic treatment. The primary objective of treatment is a stable functioning occlusion and the avoidance of relapse.

The key principles of retention and long-term stability in orthodontics are reviewed and the current evidence based approach is considered as a universal guideline for successful planning of retention. In cleft care, retention is considered in two ways; firstly as intermediate during the transitory phases, and secondly as long-term at the end of the 20-year care pathway.

In patients with cleft, the relapse tendency is greater than in non-clefts. Theses patients are faced with challenges from additional factors that may contribute to this relapse tendency. These factors are each considered: The multiphasic nature of the 20-year cleft treatment pathway means that there are several transitory phases which may wear out the patient compliance. Soft tissues are key players in stability and in patients with cleft, scarring in the lip and palate leads to tightness and tendency for migration of teeth. Facial growth is unpredictable and so overcorrection maybe considered. Dental anomalies and malformed teeth are more common in cleft and there is an inherent predisposition to dental disease, so careful planning is required for safe retainer use.

Until reliable evidence to answer fundamental questions is available, methods to overcome these challenges are considered and personalised retention plans are proposed for the multidisciplinary nature of cleft care.

Improvement In Acceptance Of NAM Appliance While Using Denture Adhesives

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AIM

The aim of this study is to analyse the acceptance of the NAM appliance by the child and the parents while using denture adhesive rather than extra oral tapes for retention.

MATERIAL AND METHODS

The NAM appliance was fabricated and the molding was done according to Grayson's technique. The extra oral tapes were replaced with denture adhesives for retention of the NAM plate.

RESULTS

The acceptance of the NAM appliance was better with the denture adhesive since it was an easier method than the taping. Since the adhesive does not dissolve in water the plate need not be reinserted many times in a day. While in the case of extra-oral taping the tapes loses its adhesive property when it comes in contact with water and so it has to be changed many times.

Sincipital Encephalocele

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Encephalocele is protrusion of the brain outside the skull. Depending on the content it may be a cranial meningocele or meningo-encephalocele. When it includes part of the ventricle it is known as hydroencephalocele. Encephalocele word is generally used in this context.

A number of classifications have been in vogue, however the classification of the Suwanwela and Suwanwela (1972) is the most accepted one.
The incidence of encephaloceles is reported to be 1 in 3000 to 10000 live births. Encephaloceles of occipital region are more common (75%) than anterior (15%) encephaloceles. Basal encephaloceles such as trans-sphenoid and trans-ethmoidal are even rarer. In the western world occipital encephaloceles are commoner, however in the south-east Asia anterior encephalocele have a greater incidents.

The anterior encephaloceles comprise of sincipital encephalocele and basal encephalocele (fig.1&2). The sincipital encephalocele is at the level of foramen caecum, which represents the anterior neuropore. This points to a open neuropore as one of the theories for the development of sincipital encephalocele. Depending on the track taken by the herniated brain (fig.3) from the foramen caecum, they are classified as nasofrontal type (where the herniated brain takes the course between the frontal and the nasal bones). In the nassoethmoidal type the brain takes a course between the nasal bone and the cartilageneous portion of the nose. In the naso-orbital type the protruding mass is between the frontal process of maxilla and the lacrimal bone.

In most of these patients there is hyper telorism and a long nose deformity. The treatment is surgical and basically consists of excision of the hernial sac, repair of the dura and bony correction. The procedure is usually done after 1 year of age.
The procedure can be done through an extra cranial or a combine intra and extra cranial approach. In most of the situation the latter approach is preferred.

An audit of 114 cases from 1997 to 2017 is presented below.

**Sincipital Encephaloceles**

Period 1997 - 2017

- Inter Frontal - 36
- Naso Frontal - 42
- Naso Ethmoidal - 14
- Fronto Ethmoidal - 18
- Naso – Orbital – 04

**Total** - 114

**Associated Problems**

- Fronto-Nasal Encephaloceles

Ancillary Procedures:

- VP Shunt – 14
- Bone Graft to Dorsum - 66
- Lumbar Drain - 16

- Hypertelorism - - - 66 Pts
- Telecanthus - - - 34 Pts
- Nasal abnormality - - - 42 Pts
- Microphthalmos - - - 02 Pt
- Craniostenosis - - - 04 Pts
- Corpus callosum agenesis - 04 Pts
- Cleft Lip & Palate - - nil
- Arnold Chiari Malformation - 04 Pts
Surgery

Timing - > 1yr of age

Two Stage Repair - 18

Single Stage Repair – 96

Extracranial – 22

Intracranial – 92

Complications

- CSF Rhinnorrhoea - - - 28 Pts
- Meningitis - - - Nil
- Recurrence (Had intracranial closure only) 2 Pt
- Hypertelorism Persistence - 18 Pts
- Canthal Drift - - - 16 Pts
- Death - - - 2 Pts

The Problems in the management is that the patients usually report late due to ignorance and due to fear of long surgery, fear of loss of vision or even death. Most of the patients belong to the low socio-economic status and or also not in a position to take care of the cost associated with the surgery and immediate post operative care.