

# Novel Technologies in Cleft Lip and Palate Deformities

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## Review Article

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### ABSTRACT

Cleft lip and palate deformities are the most common facial and oral anomalies. Cleft forms are associated with severe nasolabial deformities which present a significant surgical challenge to gain a functional and aesthetic outcome. Presurgical infant orthopedics has been used in the treatment of cleft lip and palate since a long time. Along with McNeil method, several methods and modifications have been developed by several clinicians over time. However, there is no consensus in the literature on infant orthopedic methods. Therefore, the aim of this review is to discuss presurgical infant orthopedic methods, advantages and disadvantages. Presurgical orthopedics allows the alignment of cleft segments, molding alar cartilages and nose tip. This procedure allows implementing primary alveolar grafting or gingivoperiosteoplasty to establish a union bone at the cleft side as well. However, there are studies that report about the negative effect of presurgical orthopedics on the maxillary arch. There is still no harmony in the literature on the best protocol for orthopedic and surgery methods for the treatment of cleft lip and palate in infants.

## INTRODUCTION

Clefts of the lip and palate are the most common facial and oral anomalies. These anomalies usually appear with significant variation in form and extremity<sup>[1-6]</sup>. The cleft of the palate and alveolus divides maxillary structure of the cleft lip and palate in two to three segments. A unilateral cleft defect is characterized by a wide nostril base and separated lip segments on the cleft side<sup>[7-11]</sup>. Severe cleft forms are correlated with severe nasolabial deformities, and present a remarkable surgical challenge in order to achieve functional outcomes. The affected lower lateral nasal cartilage is replaced laterally and inferiorly, resulting in a depressed dome, increased alar rim<sup>[12-17]</sup>, oblique columella, and overhanging nostril apex. When combined with cleft palate, the nasal septum deviates to the non-cleft side along with shift of the nasal base. Depending on the equality of involvement on sides, the bilateral cleft lip and palate may be symmetrical or asymmetrical<sup>[18-27]</sup>. In these patients, both nasal chambers are in direct communication with the oral cavity. Turbinates are clearly visible in both the nasal cavities. The premaxilla may be small or large, and ventures considerably forward from the facial aspect of the maxilla<sup>[28-36]</sup>.

### Society and Journals

The purpose of Open access journals is to spread information and permit that information to be designed upon. It has substantial positive impact on everything from education to apply of medication to the flexibility of entrepreneurs to initiate. It provides access to everyone and so scholars universally can find and use research work with ease<sup>[37-45]</sup>.

In order to promote consciousness among the people, physicians and research experts unite to form a society or an organization. The main intention of these societies is to counsel and promote awareness among the victims of cleft lip and palate abnormalities. Major societies like The European Society of Aesthetic Surgery (ESAS) is a very active, primary and foremost society in teaching aesthetic plastic surgery. This association offers information regarding latest technologies and the development of the practices of ornamental surgery<sup>[46-49]</sup>. Society of Otolaryngologists & Head Neck Surgeons of Bangladesh is playing inventive role in introducing, popularizing & disseminating new innovations, world-class techniques, hands on training among the otolaryngologists & head neck surgeons of Bangladesh. Alexandria Oral Implantology Association spread information of Oral Implantology among the society and media as a new treatment modality. Tunisian Association for Dental Research is a dental association from Tunisia consisting of all the professors and researchers in the dental field. The main objective of the association is to endorse research in dentistry by providing various resources of training and application.

Open Access literature plays a key part in proving the information and current researches across the sphere. Journal of Surgery intends to bring out the most complete and reliable cause of information on the detections and existing developments in the mode

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of original articles, review articles, case reports, short communications, etc. in all ranges of the field of general Surgery and making them freely accessible through online without any restrictions or any other contributions to researchers globally<sup>[50-58]</sup>. Dentistry is a peer reviewed medical journal that distributes articles in a varied range of fields on like Endodontics, Orthodontics, Dental Implants, Prosthodontics, Restorative Dentistry, Oral and Maxillofacial Surgery, Periodontics, Forensic Dentistry, Digital Dentistry, Minimal Intervention Dentistry, etc. and creates a stage for the authors to make their involvement towards the journal. Cosmetology & Oro Facial Surgery is the division of medicine that deals with dental and facial defects produced either from any accident or inherited disorders which can be rebuilt by various Oral and Maxillofacial surgeries. It is a peer-reviewed and open access journal which aims to provide fast and consistent source of information on current discoveries and current developments in the mode of original articles, review articles, case reports, short communications, etc. in all areas of the field and making them freely obtainable through online without any limits or any other subscriptions to researchers worldwide<sup>[59-65]</sup>.

Archives of Surgical Oncology is an open access journal which publishes articles that are peer-reviewed. The journals aims to publish articles which improve the knowledge of surgical oncologist with the progression in the treatment and methods in surgery accomplished for cancer treatment. Tropical Medicine & Surgery is a peer-reviewed open access journal. Articles to be considered should in the form of unique research, review, case studies, short statement etc. and readers can contact information in a barrier-free style<sup>[66-74]</sup>. Tropical Medicine includes conditions that occur solely or mainly in the tropics, as well as those that are harder to manage or control in the tropics.

Presentation at conferences, symposiums, workshops also produces a better acquaintance to health information and progressive technologies that are being created in the current generation. 5th Global Summit and Medicare Expo on Head and Neck Surgery held in June 19-20, 2017 Philadelphia, Pennsylvania, USA, in which Professor Simion James Zinreich presented his views about new imaging methods in defining the anatomy of the nasal cavity and paranasal sinuses in making for FESS<sup>[75-78]</sup>. Professor Mohammed Osama Hegazy also presented his views concerning repair of anterior septal perforation by using anterior ethmoidal artery flap. 6<sup>th</sup> International Conference and Exhibition on Surgery held in September 07-09, 2017 London, UK, the scientific lectures conveyed were one of the most challenging burdens of the recent times. 2nd International Conference on Plastic and Aesthetic Surgery held in July 27-28, 2017 Vancouver, British Columbia, Canada, in which experts like Dr. Nikolay Serdev and Dr. Aziz Ghahary gave valuable comments regarding plastic aesthetic surgery<sup>[79-86]</sup>. 29<sup>th</sup> International Conference on Oral Health and Maxillofacial Surgery held in August 21-22, 2017 Edinburgh, Scotland, the scientific lectures conveyed were one of the most challenging burdens of the recent times.

### Experts Talk

As the surgeries have become more predominant, there are numerous scientific professionals are trained particularly in performing surgeries. Eugen TARCOVEANU is Professor of Surgery who accomplished his Doctorate from The University of Medicine Iasi and is also rationalized as the President of Romanian Society of Emergency Surgery and Trauma. He is expert in the field of Laparoscopic Surgery, General Surgery, Hepato-Biliary Surgery, and Oncologic Surgery<sup>[87-93]</sup>. Radu MOLDOVANU is a Senior Surgeon Les Bonnettes Hospital Arras. His areas of interests are: colorectal surgery, abdominal wall surgery, pancreatic surgery, laparoscopic surgical studies. Adrian LOBONTIU is an experienced general surgeon, whose specialization is in robotic surgery and minimally invasive surgery<sup>[94-99]</sup>. His part of expertise is upper GI surgery. In the Journal of surgery author Elçin Esenlik published an article on Presurgical Infant Orthopedics for Cleft Lip and Palate: A Review, which is released in volume 11 issue 1.

### Complications

Some studies have mentioned complications in soft and hard tissues using PNA6 therapy. Grayson and Maull reported some problems which includes soft tissue breakdown, intraoral ulcerations, and failure to apply tapes and elastics, cooperation issues, and the eruption of neonatal teeth during treatment. They described that common areas of failure were the frenulum attachments, the anterior premaxilla or the posterior faces, as the molding plate is withdrew<sup>[100-113]</sup>. They also stated that the intranasal lining of the nasal tip can become reddened if too much force was applied by the upper lobe of the nasal stent. The other most frequent problem was the development of cheek skin rashes. In the study of Lewy-Bercowsky et al., soft and hard tissue complications were cited. Contact dermatitis due to repeated removal of tapes, mega nostril formed by improper positioning of the nasal stent, over initiation of the nasal stent resulting in bruises or petechial in the dome area were mentioned as soft tissue complications<sup>[114-127]</sup>. Neonatal teeth outburst during treatment, or premature outbreak of the incisors<sup>[128-136]</sup> due to the pressure exerted by the acrylic plate, which yields a T-shape maxillary arch after the usage of the molding plate, were testified as hard tissue complications.

## CONCLUSION

It can be concluded that from this review that alignment of the cleft segments, reduction in soft tissue tension and improvement in the nasal aesthetics can be achieved with presurgical orthopedic appliances. Although in some investigations it was found that there were no differences between the groups that underwent presurgical infant orthopedics and those who did not; there is a trend towards a positive effect on nasal symmetry with the use of the PNAM appliance<sup>[137-140]</sup>. Assessments on the effects of various combinations of cleft surgery and orthopedics methods are still required. Therefore rehabilitation of cleft patients requires multidisciplinary treatment modalities.

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