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ORTHODONTICS IN CLEFT PALATE THERAPY – A CLINICAL REVIEW

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ABSTRACT

There are certain protocols to be followed in treating the Cleft palate and Lip patients. There should be perfect timing, Judgement and understanding between the different members of the team treating the patient.This is particular true with the case of rapport between the Oro- Maxillofacial surgeon and Orthodontist. This review provides few guidelines in treating the cleft palate and lip patients

KEYWORDS: Cleft palate, Orthodontics, Treatment protocol

INTRODUCTION

There are no clear-cut etiologic factors in clefts of the lip and palate that are recognizable in the individual patient, it is thought to be multifactorial with both genetic and environmental influences[1] and can be attributed directly to failure of the lateral maxillary processes to meet the medial frontal process at the proper developmental period, manifesting as cleft lip and palate. Surgical repair of the lip and palate invariably leads to a series of secondary growth disturbances, which tend to result in poor skeletal and dental growth in the transverse and antero-posterior planes, especially in the maxilla. Malocclusion in the surgically corrected cleft lip child, when the alveolar process is intact, is not related to the cleft and in unoperated clefts of the lip only the incisors show irregularity. Many of the orthodontic problems in cleft palate children are not due to cleft itself but from the effect of surgical repair. Although techniques of surgical repair of cleft palate have improved tremendously in recent years, closure of cleft palate causes atleast some degree of lateral constriction. Most of the improvements in orthodontic treatment outcomes over the past 60 years are actually related to improvements in surgical techniques rather than any significant innovations in orthodontic appliances[2]. This review outlines the problems faced and orthodontic treatment planning in cleft palate patients.

Discussion

Dentofacial growth

There usually are dental abnormalities in number, size, and arrangement of teeth in all types of cleft palate. Clefts can occur in children who would have had different types of malocclusion even if they did not have the cleft. The malocclusion is modified by the presence of the cleft. In extreme Angle Class II malocclusion the presence of a cleft may reduce the maxillary prognathism. Cleft lip is usually surgically closed several weeks after birth when the infant has made a satisfactory adjustment to life and has accepted a feeding formula and shows a steady, progressive gain in weight. Cleft palate is usually closed at between 24 to 36 months of age. Lip or nostril surgical revisions are performed at later ages. Malocclusion in cleft palate and cleft lip patients can be caused by deficiencies in the bone, soft tissues, supernumerary teeth, and missing tooth germs. Malocclusion can be caused also by excessive scar tissue resulting from extensive surgery in the growing child. When the cleft affects the alveolar process there is a malocclusion of the teeth. Clefts of the soft palate only and submucous palatal clefts do not affect the occlusion although they are a cause of speech nasality

and the clefts of the hard palate only may cause a narrowing of the maxillary arch with a tendency to crossbite, but severe malocclusions in these cases can be attributed to other etiologic factors. Accompanying abnormalities of clefts of the lip, alveolar process, and palate are difficulties in feeding and swallowing, speech defects, syndactyly, hypertelorism and other somatic and psychic disturbances[3]. In bilateral clefts of the lips there usually is lateral collapse of the maxillary buccal segments with the labial or premaxillary segment in a protrusive position. Tightness of the repaired cleft lip can cause palatal inclination of the maxillary incisors and anterior cross bite.

Orthodontic intervention

Orthodontic therapy is required to prevent or correct collapse of the maxillary dental arch before and after surgical lip closure[4,5]. Orthodontic treatment in the deciduous dentition when the roots show advanced resorption is of no value. Removable appliances should be used where possible in the deciduous and early mixed dentitions. The orthodontist in the cleft palate team is concerned with consultation and advise on dentofacial growth, preparing diagnostic aids and records including dental impressions and casts, photographs, and face casts. Orthodontic preparation includes taking radiographs i.e. periapical dental films; lateral jaw, cephalometric, and posteroanterior films, and tracings of cephalograms, making stents to maintain lip contour and prevent postoperative lip tightening; providing orthodontic treatment preoperatively, postoperatively and before the construction of prosthetic appliances and finally correcting malocclusion.

Timing of orthodontic treatment

Orthodontic therapy in cleft palate patients does not follow the usual pattern that applies to children without clefts. Treatment is on a periodic basis, which may be for as little as a few months to correct what is required at a given time, followed by long periods of retention which is inevitable[6,7]. There may be a number of periods of supervision necessary when further orthodontic treatment has to be held in abeyance for the dentition to gain further development. It frequently is necessary to initiate a short period of treatment in a cleft palate child, while in the child with a normal palate it would be better to wait until more development has taken place. Crossbite should be corrected as early as possible, as is true also for the child with a normal palate. Contraindications to orthodontic therapy are the general physical condition of the patient, lack of bone available in the area in which teeth are to be moved, the presence of deformed teeth that cannot be moved and made serviceable, presence of a large number of missing teeth, and the fact that extensive prosthetic appliances would be required which would not be aided by orthodontic treatment. Advantages of orthodontic treatment are the improved function and esthetics, more secure retention of prosthetic appliances and facilitation of speech therapy. The deficiency in bone and soft tissues as a result of the cleft present certain limitations to the extent and direction of tooth movement. Supernumerary teeth in cleft palate patients should be allowed to remain in the mouth if they are erupted and can be made useful. They should be extracted if they are impacted and interfere with the eruption of adjacent teeth. Malformed teeth should be allowed to remain if they can be brought into occlusion and restored by jacket crowns. Teeth in supraclusion should be brought into occlusion by orthodontic means. When the maxillary dental arch is expanded in cleft palate patients, permanent retention by means of a plate or bridgework may be required. In dental arches where the teeth are inclined palatally they should be uprighted. Orthodontic treatment in cleft palate may be performed with fixed or removable appliances. Interjaw traction may be used to correct collapsed maxilla.

Postoperative anomalies

Postoperative dentofacial abnormalities in children with cleft palate include; Anterior and posterior crossbite, collapse or underdevelopment of the anterior and buccal maxillary segments, openbite or dental arch collapse in association with maxillary underdevelopment and bone deficiency, resection of the frontal portion resulting in collapse of the alveolar arches and severe malocclusion. McNeil pointed out that undesirable changes begin to occur in children with cleft palate immediately after birth, and that these are accentuated by early surgical closure of the lip and palate[8]. Lip surgery should be postponed until the bony segments have been moved into favorable position. Repair of the soft palate then is performed, and the functioning muscles should be brought into apposition before faulty speech patterns are formed. Alignment of the palate in the cleft palate patient eliminates many of the problems that orthodontists, dental prosthodontists and speech therapists face when treating the cleft palate patient at a later age. Bone grafting to supply missing tissues in oral clefts is now practiced widely. Rosenstein advocates bone grafting after the alveolar ridges are aligned. The graft, usually an inch long, is taken from the sixth, seventh, or eighth rib. The abnormalities of the teeth, the nasal structures, and the tongue contribute to speech difficulties in articulation which are usually accompanied by hypernasality and if the soft palate is tight, scarred, short, or cleft, if the hard palate is too high or too flat, if there are certain types of malocclusion and obstruction or irregularity in the nasal cavity, or the upper lip is tight and scarred. Surgical

operations are best performed before the optimum age for development of speech is passed and before defective speech patterns are fully established[9]. Since the majority of consonant sounds is used before the end of the first year, early cleft palate closure operation actually can be effective in aiding speech. Problems of speech may originate from imitative psychological and neurologic causes as well as from disturbed anatomy and physiology. Consideration should be given to the complete biosociopsychic dynamics of the patient.

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CONCLUSION

While counseling the parents an attempt should be made to alleviate their many fears and anxieties. They are advised that the patient should be thought of and treated as a normal child. Under supervision and treatment, they should be assured, and precluding unforeseen disturbances, the child will develop into a healthy adult with a normal appearance as intermaxillary relationship can be improved tremendously by using maxillary expansion appliance and class I molar relation can be achieved with normal overjet and overbite.

References

1. Andrea L, Mello JD, Sanjay Kumar. Speech understandability of repaired cleft patient's pre and post caregiver training. Indian Journal of Plastic Surgery.2007; 40(2):122-128.
2. Long R E et al. Orthodontic Treatment of the Patient with Complete Clefts of Lip, Alveolus, and Palate: Lessons of the Past 60 Years. Cleft Palate–Craniofacial Journal, November 2000, Vol. 37 No. 6, 533-547.
3. Bolin, A.: Dental anomalies *in* harelip and cleft palate. Acta Odont, Scandinav., 21 :38, 1963.
4. Crikelair, G. F., Born, A. F., Luban, L and Moss, M.: Early orthodontic movement of cleft maxillary segments prior to cleft lip repair. Plast. Reconstr. Surg., *30:426, 1962.*
5. Rosenstein, S. W.: A new concept in the early orthopedic treatment of cleft lip and palate. Am. J. Orthodontics, 55:765, 1969.
6. Pruzansky,S. Effects of Cheiloplasty on the maxillary arch in newborn infants with complete bilateral cleft lip and palate. Amer.J.Orthod; 39, 712. 1953.
7. Subtelny, J. Daniel. The significance of early orthodontia in cleft palate habilitative planning. J.Speech hearing dis, 20; 135-147, 1955.
8. Mc Neil, C. K.: Oral and Facial Deformity. New York, Pittman, 1954.
9. Wildman, A. J.: The role of the soft palate in cleft palate speech. Angle Orthodontist, 28:79, 1958.