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Malocclusion due to early surgical management of newborn cleft lip and palate

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ABSTRACT

The early surgically repaired cleft L/P patients specially bilateral most of them will complain at future from malocclusion, velopharyngeal incompetence and speech problems due to displacement and deficiency of premaxilla and maxillary segments, while the early treatment by the use of orthodontic prosthesis and continuous separation of oral and nasal cavities to restore the anatomical and function is necessary for each cleft palate patients to create normal pattern of feeding, speech, hearing and facial growth. In this study, we focus on the problems resulting from early surgical treatment which lead to different premaxilla and maxillary segment movements which lead to different type of malocclusion and classified them according to these types of movements. 60 Iraqi patients were surgically repaired their cleft L/P during the first year of life was chosen randomly as a study group and a set of study casts were taken for each patient and classified them into four groups according to the development and direction of the segment. Group I: The collapse of maxillary segments bilaterally, medially with protrusion of premaxilla. Group II: The collapse only one lateral segment medially. Group III: Bilateral maxillary segments separated laterally with Regression of premaxilla backwards. Group IV: Normal lateral segments and very little protruded premaxilla. The percentage of each group was 32% G4, 30% G1, 25% G2 and the least was group3, ITS' percentage 13%. It was concluded from this study that the cooperative intervention between the orthodontist and maxillofacial surgeon and the early treatment of Cleft L/P infant by orthodontic prosthesis is the most versatile treatment, and the severity of collapse during early surgical treatment depends on the size and site of the cleft L/P.



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INTRODUCTION

The early treated cleft lip and palate patients and continued separation of oral and nasal cavities by

prosthesis to restore anatomy and function are necessary for each cleft palate infant to create normal patterns of feeding, speech, hearing, and facial growth to be appeared well developed, while the early repaired cleft lip and palate patient especially bilateral most of them complain in future from velopharyngeal incompetence, speech problems, which may need speech therapist, displacement and deficiency of premaxilla so upper lip appeared flat or retarded in relation to the lower lip, or the premaxilla protruded with collapse of the maxillary posterior segments, the patient mouth look like a rabbit mouth appearance, lack of maxillary growth will lead to asymmetry of facial appearance

and psychological deficit (Shetye, P. R., 2016), (Ellore et al., 2012)

In infants with any of these deformities if treated with faulty surgical planning due to lack of cooperation between surgeon and the orthodontics team the surgeon will close the deformity alone which may result in disasters complication, so in such cases collaboration team is necessary (Haas, A. J., 1970), (Garrahy, Millett, & Ayoub, 2005)

In this study, we focus on the problems which resulted from early surgical treatment which lead to different premaxilla and maxillary segments movements and classify them according to these types of movement (Georgiade, N. G., 1970), (Kadhim, E. A., 2018).

Material and method

Sixty (60) Iraqi patients were surgically repaired their cleft lip and palate during the first year of life, randomly selected as study group in institute of medical technology for speech therapy in Baghdad during the past three years, for each of these patients, a set of dental records casts, were taken examined and graded according to the extent and type of collapse of the repaired clefts.

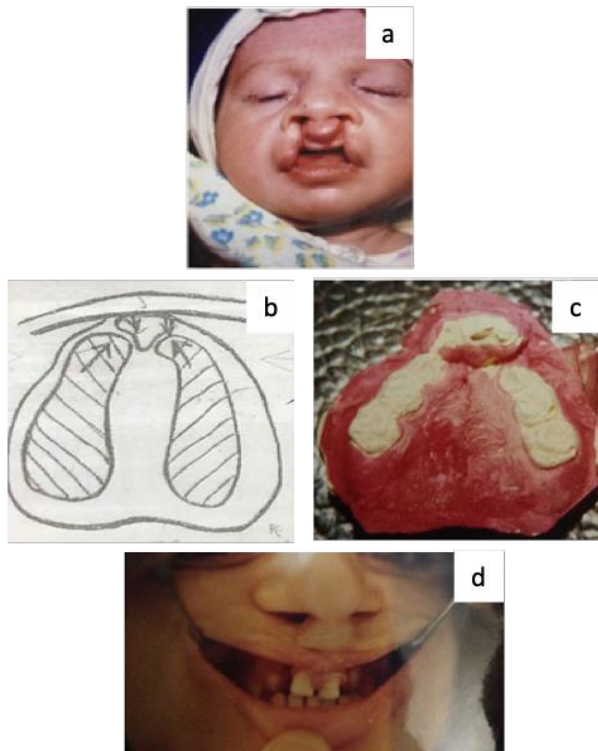


Figure 1: Demonstrate the two lateral maxillary segments collapsed medially and protruded premaxilla

The upper dental casts are divided into four groups:

Group I, collapsed the two maxillary segments medially with protrusion of premaxilla forward (Fig. 1 b, c)

Group II collapsed only one lateral maxillary segment medially with protrusion of premaxilla forward. (Fig. 2 b, c).

Group III, the two lateral maxillary segments separated laterally with regression of premaxilla backward. (Fig. 3 b, c).

Group IV, normal lateral segments and premaxilla are little protruded (Fig4 b, c).

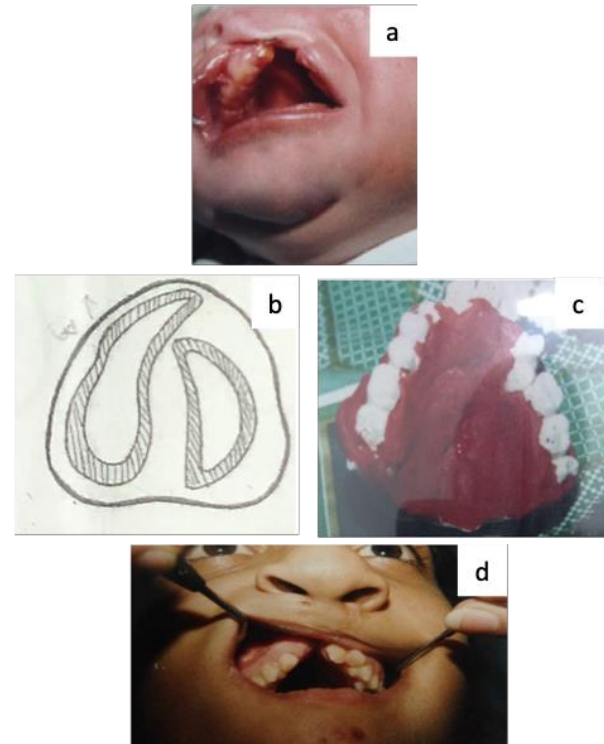


Figure 2: Demonstrate the unilateral maxillary segment collapsed medially and the other segment in normal alignment, with the little protruded premaxilla

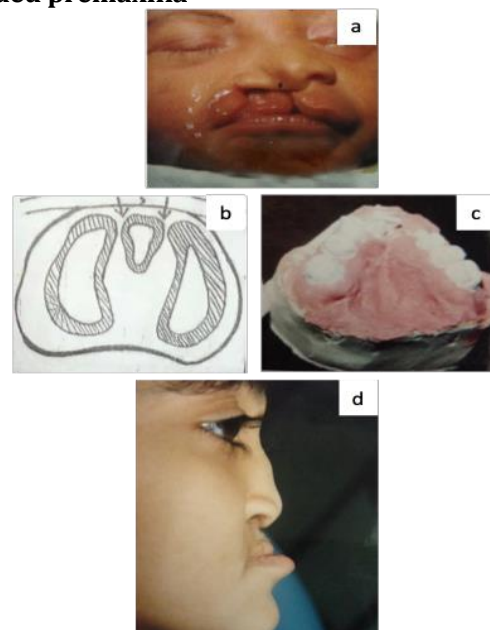


Figure 3: The two lateral maxillary segments separated laterally with regression of premaxilla backward

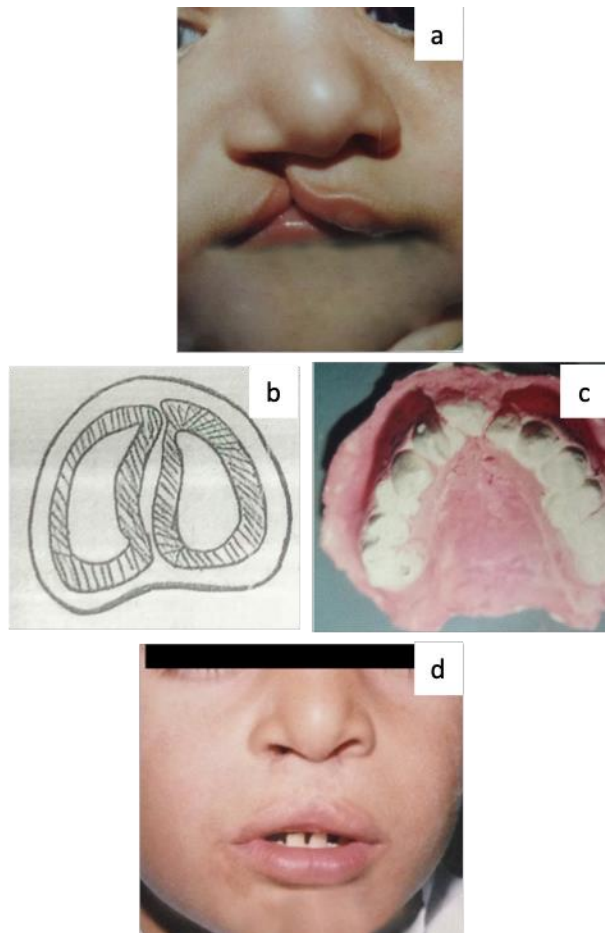


Figure 4: Normal lateral segments and premaxilla is little protruded

RESULTS

The results of our study show the group I that the cleft palate repaired with 2 lateral maxillary segments collapsed medially and the anterior segment is forward, the patient mouth look like rabbit mouth and the upper dental arch became narrow and malformed as the show (fig 1d). In the cases of this group, the lip exerts pressure on premaxilla after surgical repair, so it becomes smaller. The cases of group II show the one segment is normal and the other collapsed medially the normal lateral segment protruded forward by the pressure exerted upon medially collapsed maxillary segment as shown in (fig 2d).

While the cases for group III shows that the two lateral maxillary segments are separated laterally and the premaxilla moved backwards by the action of repaired cleft lip, the upper lip appeared flat and rolled below the premaxilla as shown in (fig 3d).

In cases of group, IV shows normal upper arch and no need alignment, so the repaired cleft lip and palate do not create malformation to the upper dental arch as shown in (fig 4d).

Table 1 shows the distribution of groups in total number in our study.

Group 1-18 patients, Group2 -15 patients, Group3-8 patients and group 4-19

Group 4-are normal upper dental arch this is not due to treatment but the type of clefts.

Table 2 shows that 30% of total no. of the study groups had two lateral segments collapsed medially with protrusion of premaxilla, the table shows that 25% from total no. of cleft palate repair had unilateral maxillary collapse with protruding premaxilla, also this tab. Shows 13% m total no. from total cases, the premaxilla is retarded and the upper lip is flat due to the action of upper lip repair, this tab. Also shows that 32% of the total no. had a normal upper arch.

The distribution of collapse was the highest level in group IV, then group 1, group 2 and the last in group 3.

DISCUSSION

From our results shows that the severity of the problems result due to the early management of cleft L/P depend on the type of the deformity presented, so the percentage shows the highest level in group 4 not due to surgical intervention but due to normal alignment of dental arch naturally that means the size and site is very limited, also the results shows considerably high in group1 which mostly occur with bilateral defect of cleft L/P (Fig1a). So misalignments of the maxillary segments may be present at birth which should be corrected as soon as possible prior to surgical intervention. Otherwise, the tension produced by lips or cleft lips surgery will increase the deformity which already present and make the correction more difficult at future which coincides with the idea of (Baily N. Jacobson 1960; Murthy J., 2009; Salyer KE, *et al.*, 2005).

The early treatment by orthodontist will restore normal anatomy, so in future will restore more normal pattern in relation to facial growth. (Adali, Mars, Petrie, Noar, & Sommerlad, 2012)

In our opinion, this early mechanical restoration of palatal relationship stimulating normal anatomy which will assist normal function (Nicholas G. Georg 1969), for example speech therapist like elimination from glottal straps to tongue tip activity that is done by bringing the maxillary segment into proper relationship with mandible and directed the facial growth toward norms (Nahai FR, 2005, Grayson, B. H., & Cutting, C. B., 2001), (Mohammed, 2015).

Table 1: Groups that distribution in the study

Cleft lip /palate	G I	G II	G III	G IV
60	18	15	8	19

Table 2: Groups that distribution in the study

Cleft lip /palate	G I	G II	G III	G IV
60	30%	25%	13%	32%

CONCLUSION

As a result of our experience, it has become evident that the cooperative intervention between the orthodontist and maxillofacial surgeon, and the early treatment for cleft L/P infant by the prosthetic device or orthodontic is most versatile treatment.

The advantages of this type of treatment may be listed as follow:

The mechanical closer of clefts by prosthesis permitting more facilities for nourishment by decreasing the amount of food entering the nasal cavities and nasopharynx, which lead to correct positioning of maxillary segments in future.

Correct positioning of maxillary segments.

Mechanical closure of clefts permits anterior tongue thrust which balances the compressive force of lips musculature and stimulates facial growth.

The severity of collapse during early surgical treatment depending on the size and site of the cleft L/P.

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