Clinical Study for the Early Normalization of Children with Cleft Palates-A Preliminary Report

Vichit Punyahotra, M.D. and Sonia Findlay, D.D.S.

From the Division of Plastic & Maxillofacial Surgery, Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand.

INTRODUCTION

Cleft lip and cleft palate are the most common congenital anomalies in the human second only to club foot. The incidence is about 1:500 of live births and they are reported to be most frequent among mongoloid populations[14].

There is much disagreement concerning timing for surgical repair of the cleft palate patients. Most of the medical centers in North America recommend repair of cleft palate at the age of 12 to 18 months to prevent the development of false speech, but most of the centers in Europe prefer to delay surgery up to the age of 4-12 year or even later when the facial growth is adequate. The latter school gives the responsibility of correcting false speech to the speech therapist.

When a child with cleft lip and palate does not have the palate repaired surgically, there is abundant evidence that the face grows adequately[2,7,10,13,18,20,24] The evidence is overwhelming that repair of the cleft palate by any of the popular surgical techniques will result in an inhibition of the growth of the mid-face[5-8,11,12,15,16,22,23].

As a result of palatal surgery a thick band of scar tissue frequently appears on either side of posterior palate inhibiting the sutural growth of bones-maxilla, palatine bone, and the pterygoid plates of the sphenoid, creating a condition which could be termed *"maxillary ankylosis"*.

A second direct effect of palatal surgery is the distortion of dentoalveolar growth. Most techniques of palatoplasty leave an area of denuded bone close to the gum which is rapidly covered by scar tissue. The initial contraction of the tissue results in a medial movement of the maxillary segments and a medial tipping of the teeth and alveolar bone. As further tooth eruption and vertical development of the alveolar process occur, the area of scar tissue adjacent to the alveolar process resists growth and thereby induces a medial and posterior deflection of the dento-alveolar structures and the collapse of the dental arch.

The secondary effects of palatal surgery are associated with a large number of other factors of abnormal physiology which together cause a dramatic change in the posture and form of the mandible.

OBJECTIVE

The objective of this study is to develop the technique so that both false speech and facial deformities caused by unsuitable timing of palatal surgery can be avoided.

It would therefore seem desirable to repair only the soft palate together with cleft lip in infancy. Non-inhibiting obturators may be inserted at the same time to normalize the body for normal feeding and normal tongue positioning. By this method of management the child will develop both normal speech and normal facial growth. The palatal surgery will be done later when adequate facial development is achieved.

METHODS OF STUDY

1. The dental impression is done on the first examination and the model of the palate is made for construction of the obturator.

2. Clefts of the lip and soft palate are repaired when the child's age is about 3-4 months or about 10-14 lb. of body weight.

3. The obturator is inserted to close the cleft

This study is granted by the Rockefeller Foundation in the year 1977-1978.

of the hard palate. Then the child is completely normalized.

4. The obturator would be changed for every 3-6 months up to the rate of palatal growth.

5. If the hard palate spontaneously closed by growth of the palatal shelves, a relatively minor mid-line surgical procedure will be done to complete the closure with a minimum of residual scar tissue. Otherwise, the closure of the hard palate will be delayed until adequate facial growth is achieved.

SIGNIFICANCE OF STUDY

1. To be able to normalize cleft palate children at an early age (3-4 months).

2. To be able to prevent all complications of cleft palate, i.e., hearing loss, cleft palate speech, poor nutrition, etc.

3. To be able to prevent deformities caused by early palatal surgery, i.e., dish face, pseudoprognathism, poor dentition, etc.

MATERIALS AND PROCEDURE

The material for this study comprises of two groups of 60 cleft palate children of comparable ages and degree of clefts. The first group had not had surgery done (Table 1). The second group had had cleft palate repaired (control group) (Table 2).

Table 1 Ages and number of unrepaired cleft palate children.

Age (year)	Number (cases)
3/12 - 5	20
6 - 8	20
10 - 12	20

Table 2 Ages and number of repaired cleft palate children.

Age (year)	Palatal growth (compare with adult) %	Number (cases)
3/12 - 5	60	20
6 - 8	80	20
10 - 12	90	20

On the first visit, dental impression, the palatal models, speech evaluation and hearing tests were performed. The same procedures were carried out during subsequent visits for comparative study.

In the first group the models of the palates were made for construction of obturators. The cleft of the lip (if present) and the cleft of the soft palate were surgically repaired and the obturator was inserted after complete wound healing had been achieved. The obturator must be changed every 3 to 6 months according to the rate of the palatal growth. In cases when the hard palate spontaneously closed, the defects became only the slit-liked fissures. A relatively minor mid-line surgical procedure were required. We divided the rest of the patients in the first group into 3 subgroups. The surgical repair of the hard palate will be done at the age of four, eight and twelve years old, corresponding to the adult palatal growth of 60 per cent, 80 per cent, and 90 per cent respectively. The operated patients are followed up at 6 monthly intervals until they reach adulthood.

The second group of the cleft palate children were also divided into 3 subgroups as shown in Table 2. The complete closure of the cleft palates (both hard and soft) were performed by the standard plastic procedures. The patients were followed up at 3-6 monthly intervals. The dental models, speech evaluation and the hearing tests were also done before and during each visit after surgery. This group served as a control.

RESULTS

This study has been in progress for 5 years since 1974 and the preliminary results are herein reported.

1. All clefts are much narrowed by using this technique because of two factors.

Firstly, the palatal growth is stimulated by the inserted obturator.

Secondly, the muscular contraction of the closed soft palate accelerates the palatal closure.

2. The child's nourishment is much better than the control group, because the inserted obturator acts as the feeding prosthesis in the infant.

3. The children's speech is much better than the control group, because they can have tongue training during speech development as in normal children.

4. There is no hearing problem in children of the study group whereas 6 percent of children in control group have problem because the regurgitation of the fluid into the eustachian tube.

5. The facial growth of the children including the dental development is quite satisfactory.

DISCUSSION

There are two schools of thought concerning the timing of the palatal surgery in cleft palate. The first school suggests early closure to prevent the development of false speech. The disadvantage of

this technique is the occurance of facial deformities due to disturbance of the maxillary growth by surgical trauma. The second school prefers to delay the operation until the maxilla is well developed. This school ignores the false speech of the children and leaves it to the speech therapist.

We have compromised the two by developing a new technique that closes the soft palate at the time of lip repair (if present) and the cleft of hard palate is closed by the obturator. The palatal surgery will be done when adequate facial development is achieved. By using our technique, the cleft children will be normalized early and all complications of the palatal cleft can be avoided.

This study is still on going and further reports will be submitted.

REFERENCES

1. Anderson, H, and Mattiessen, M : Histochemistry of Early Development of the Human Central Face and Nasal Cavity with Special Reference to the Movements and Fusion of the Palatine Processes. Acta Anat 68:473-508, 1967.
2. Atherton, JD : Morphology of Ficial Bones in Skull with Unoperated Unilateral Cleft Palate. Cleft Palate J 14:18-30, 1967.
3. Bjork, A : Sutural Growth of The Upper Face Studied by the Implant Method. Acta Odont. Scan 24:109-137, 1966.
4. Enlow, DH : The Human Face, New York. Hoeber, 1968.
5. Foster, TD : Maxillary Deformities in Repaired Cleft of the Lip and Palate. Br J Plastic Surg 15:182-190, 1962.
6. Graber, TM : The Congenital Cleft Palate Deformity. J Am Dent Assoc 48:375-395, 1954.
7. Hagerty, RF, and Hill, MJ : Facial Growth and Dentition in the Unoperated Cleft Palate. J Dent Res 42:412-421, 1963.
8. Hama, K : Morphological Study of the Craniofacial Skeleton within a Profile in Cleft Lip Palate. J Osaka Univ Dent School 4:41, 67, 1964.
9. Harvold, E : Cephalometric Roentgenography in the Study of Cleft Palate. S. Pruzansky (Ed). Congenital Anomalies of the Face and Associated Structures. Springfiled, ill, Charles C. Thomas 1959.
10. Herfert, O : Two-Stage Operation for Cleft Palate, Br J Plast Surg 16:37-45, 1963.
11. Herfert, O : Fundamental Investigations into Problems Related to Cleft Palate. Br J Plast Surg 11:97-105, 1958.
12. Hugg, JR, and Kremenak, CR : Growth of the Maxillae in Dogs after Palatal Surgery Studied with the Aid of Vital Staining (abstract). Am J Orthodont 54:930, 1968.
13. Innes, CO : Some Preliminary Observations on Unrepaired Harelip and Cleft Palates in Adult Members of the Dusan Tribes of North Borneo. Br J Plast Surg 15:173-181, 1962.
14. Ivy, RH : The Influences of Race on the Incidence of Certain Congenital Anomalies, Anomialies, Notably Cleft Lip-Palate. Plas Reconstr Surg 30:581, 1962.
15. Johnston, MC : Preliminary Investigation of Facial Growth Trends in Children with Different Types of Clefts. The Cleft Lip and Cleft Palate Research and Treatment Center. A Five Year Report. Toronto. The Hosp for Sick Children, 1961.
16. Jolleys, A : A Review of the Results of Operations on Cleft Palate with Reference to Maxillary Growth and Speech Function. Br J Plast Surg 7:229-241, 1954.
17. Latham, RA, and Burston, WR : The Effect of Unilateral Cleft of the Lip and Palate on Maxillary Growth Pattern. Br J Plast Surg 17:10-17, 1964.
18. Mestre, J, De Jesus, J and Subtelny, JD : Unoperated Oral Clefts at Maturation. Angle Orthodont 30:78-85, 1960.
19. Narula, J and Ross, RB : Facial Growth in Children with Complete Bilateral Cleft Lip and Palate. Cleft Palate J 7:239-248, 1970.
20. Ortiz-Monasterio, F, Sevano, A, Barrera, G et al : A Study of Untreated Adult Cleft Palate Patients. Plast Reconstr Surg 38:36-41, 1966.
21. Scott, JH : Growth at Facial Suturs. Am J Orthodont 42:381-387, 1956.
22. Shibisaki, Y and Ross, RB : Facial Growth in Children with Isolated Cleft Palate. Cleft Palate J 6:290-302, 1969.
23. Slaughter, WB and Brodie, AB : Facial Cleft and Their Management in View of Recent Research. Plast Reconstr Surg 4:311-332, 1949.
24. Van Lamborgh, J : Some Aspects of the Development of the Cleft Affected Face. R. Hotz (Ed). Treatment of Cleft Lip and Palate. Berne : Hans Huber, 1964.