Deformity of Nose in Unilateral Clefts

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Nasal deformities in unilateral clefts are one of the most difficult and challenging problems which plastic surgeons are facing and trying to solve. It is difficult to say what is the exact nature and genesis of the actual deformity. This question is still a matter of dispute that requires a correct explanation. This consideration has prompted us to undertake some basic studies together with clinical observations of these deformities.

Method and Material

The present work is mainly limited to the study of 30 unilateral clefts from a group of patients that were admitted in Plastic Surgery Unit, Department of Surgery. In every case dental cast was prepared. The area of the dental cast was measured, by putting the dental cast under the glass, fixed with Leucoplast. Tracing of the teeth were done. This tracing of teeth were traced on

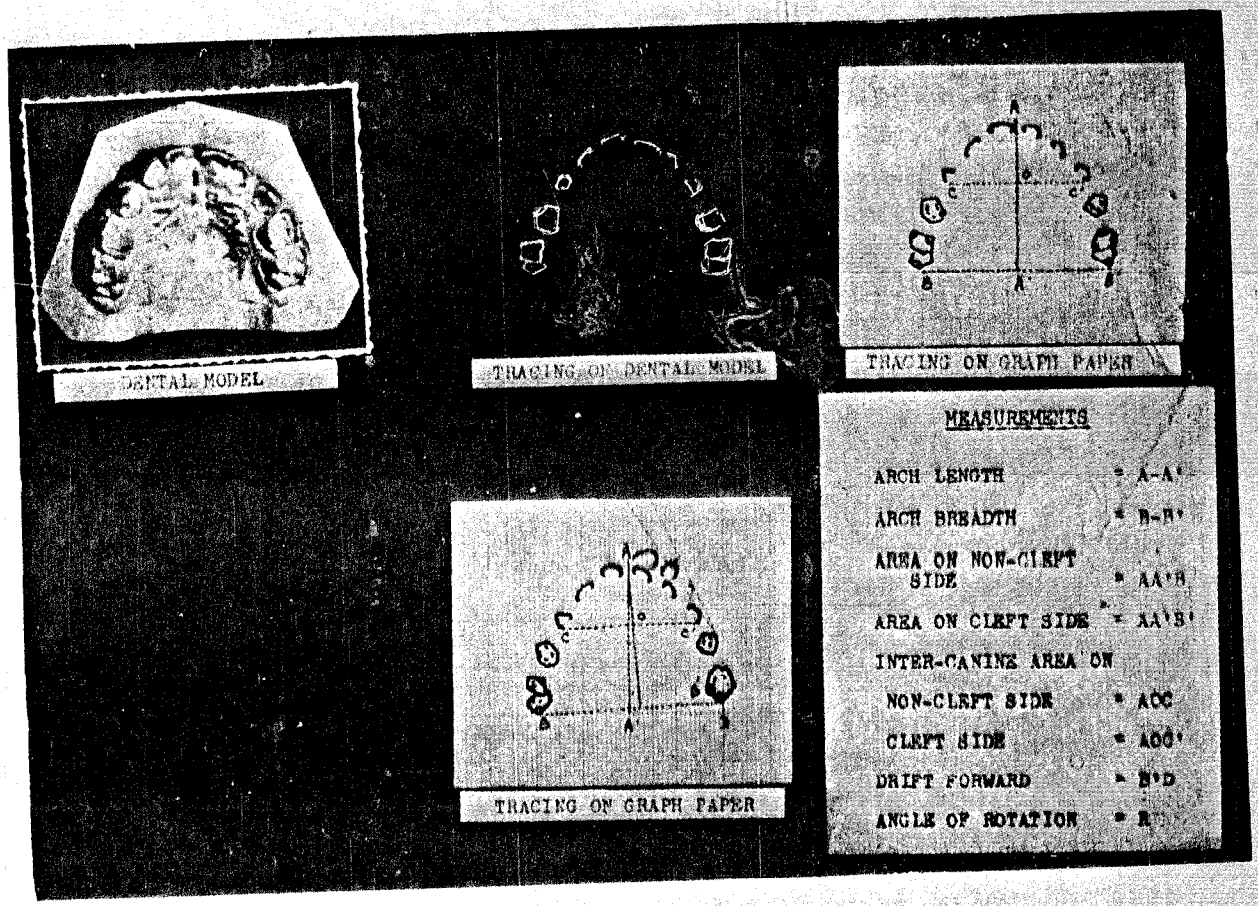


Figure 1

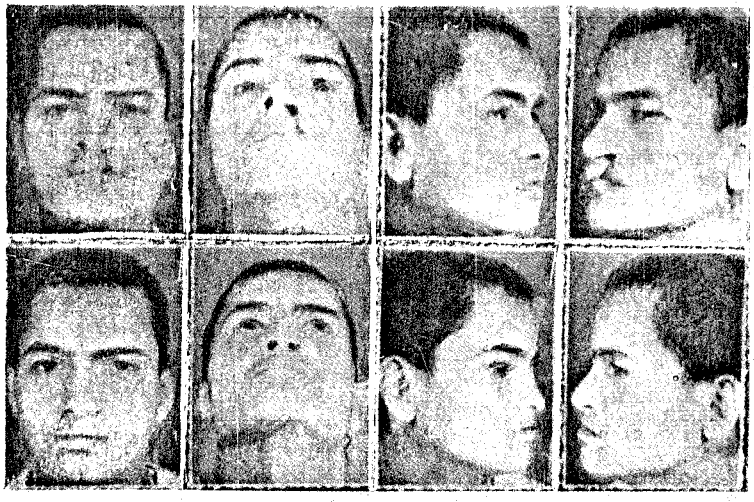
graph paper and the various areas were calculated (Fig. 1).

—Arch length. ... A-A'
—Arch breadth ... B-B'
—Inter Canine Line ... C-C'
—Area on non-cleft side ... AA'B or AA'B'
—Area on cleft-side ... AA'B' or AA'B
—Inter-Canine area on non-cleft side ... ACC or ACC'
—Inter Canine area on cleft side. ... ACC' or ACC
—Drift of the arch was obained by counting the number of small squares on the cleft side (B'D or BD).
—Angle of rotation was measured by duplicating the tracing of the canine of one side over to the other. Lines were drawn from molar to canine of each side. The angle formed between these two lines was taken as the angle of rotation.

Cases	No angle of rotation or drift of the arch	Angle of rotation Present	Drift of the arch present	Angle of rotation & drift of the arch present
30	9	6	8	7

Discussion

The discussion of the problems involved in the study of nose defects in unilateral clefts revolves around two questions mainly i.e., What is the cause of the deformity ?



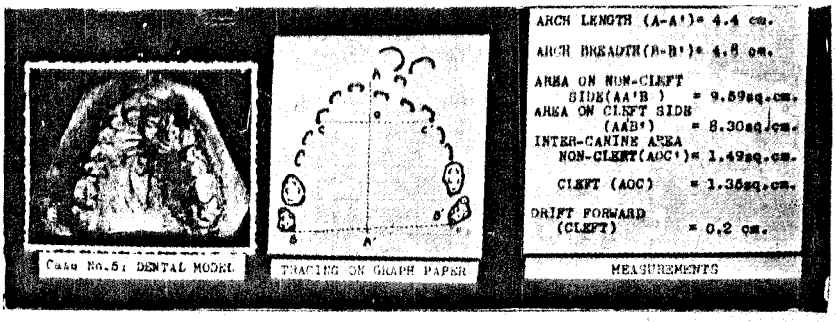


Figure 2

and how best to correct it ?

In measurements of 30 dental models in cleft cases, it was found that the total proportionate area of the palate has decreased on the cleft side and mostly the inter-canine area is affected (Khan and Sharma, 1970). The inter-canine area is in direct proportion to the severity of the defect. The difference of the inter-canine area is also responsible for the angle of rotation. From these findings we infer that the deficiency of bone is restricted to the inter-canine area i.e. the area of the primary palate, which is responsible in giving rise to the nose deformity. Brown (1964); Stenstorm and Thilander (1965) reported a typical cleft lip nose without any apparent cleft lip. In many instances unilateral cleft of the lip, the ala look normal and symmetrical but on measurement the palatal area is reduced on the cleft side. Therefore, one can say that if the inter-canine area and the angle of rotation were studied in Brown's Stenstorm and Thilander's patients, there must have been some difference in the inter-canine area.

1. No Maxillary Deformity

When the present work was taken, Millard's (1964) technique with various minor adjustments were being gradually introduced. With this technique, excellent correction of the nasal deformity and the lip were obtained. These patients had complete bony fusion of

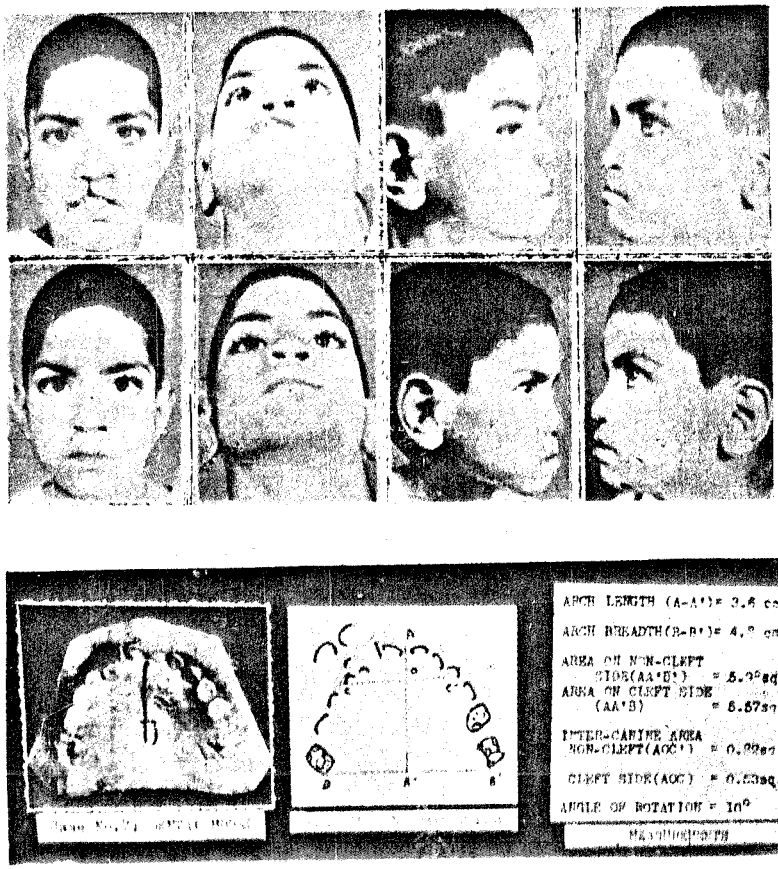


Fig. 3

the palate without any difference in measurements on the two sides (Figure 4). The result of correction of the nasal deformity were good, than those that show angle of rotation or drift of the arch.

2. Drift of the arch

In cases where the drift of the arch is present (Figure 2), the cleft segment has either been rotated or pushed forward; these are the cases where the area of the secondary palate has also decreased. It means that the deficiency is in the secondary palate also. During development after repair these cases due to deficiency in secondary palate, may develop progressive nasal deformity. This depends largely on the extent of the forward drift. Many of them particularly in the growing age period do not necessarily need elaborate procedure because with the restoration of musculature of the upper lip, slight forward drift may correct itself. This gives support to the teachings of Gillies and Kilner (1932) that such post-operative deformities in the nose are likely to correct themselves as the child grows. In the older age group the nasal web correction either with Z-plasty or other procedures has to be added in those who merely show forward drift only.

3. Angle of Rotation

At the time of operation and on dental

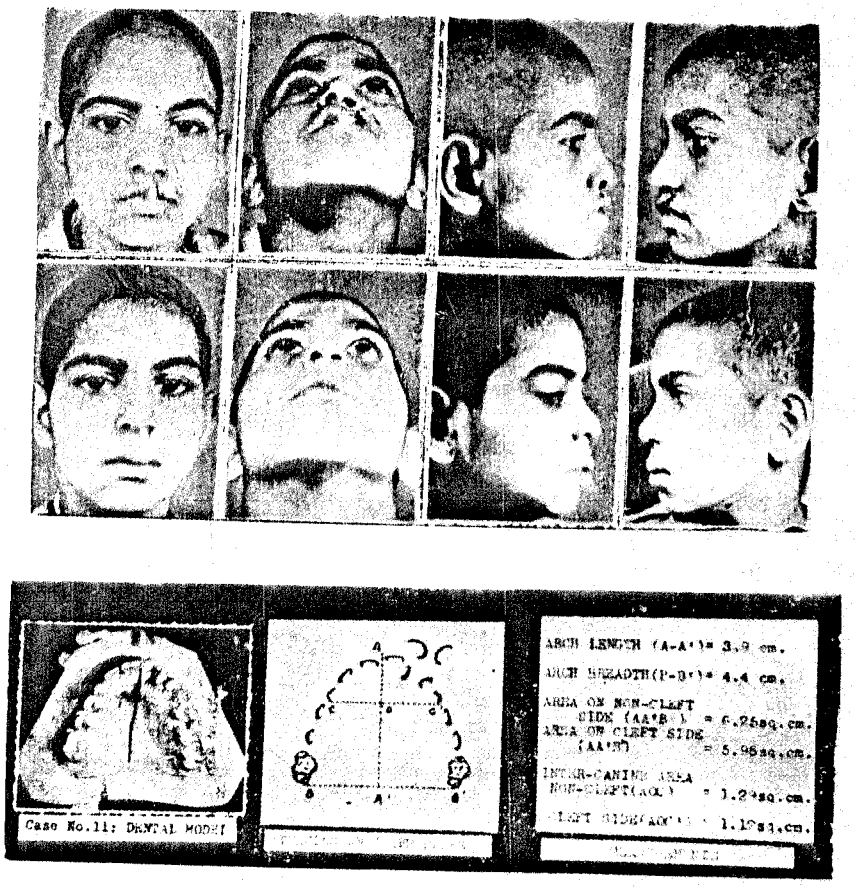


Fig. 4

measurements the deficiency of bone is revealed, that showed angle of rotation and reduction in the inter-canine area (Figure 3). In certain instances in order to obtain better mobilization of the ala the whole flap of the cheek is raised from the outer surface of the maxilla with an incision in the gingival sulcus. This deficiency which obviously becomes quite evident indicates that it should be made good with additional bone graft or bone chips. It may be argued that lifting of the mucoperiosteum from the bone itself may initiate bone formation but at the same time it also interferes with its blood supply that may effect the growth process adversely.

Our analysis of the immediate post-operative results in this group reveal excellent results with ordinary repairs without the addition of bone. However, only those who had alveolar cleft were supplemented with bone chips or bone graft. This has also been advocated by Longacre and Halak (1966). But if the repairs are undertaken in older age groups then additional bone must be added in all those cases who reveal deficiency i.e. angle of rotation. This will not only bring the ala in proper alignment, but also gives a better profile .

Drift and Angle of Rotation

But where both, drift and the angle of rotation is present (Figures 5 & 6), these cases have defect in the primary and the secondary palate. These are the patients, perhaps, who may develop the most severe type of nasal deformity post-operatively. These are the cases which require bone graft.

Septal defects are always associated with the angle of rotation which means that there is diminution in the inter-canine area on the affected side. This diminution does not have a balancing effect on the growth of the

dental arch. Because the pre-maxilla is fused with the maxilla on the non-affected side, the deviated central nasal spine carries the septum towards the opposite side apparently due to the rotational twist on the pre-maxilla. So the nasal septal defects and their severity directly depend on the junctional instability. As one finds in Group III.1 (alveolar cleft) where due to the twisting effect on the pre-maxilla the septum not only shifts towards the non-affected side but it undergoes a twist in its vertical axis thus producing a 'S' curve.

We are therefore, in agreement with Longacre et al (1966) that the cause of the deformity is the agensis or hypoplasia of the maxilla and is corrected by bone graft. Hence, the indications for bone grafts are :

1. When the difference in the inter-canine area is more than 0.5 Sq. Cm.
2. During soft tissue mobilization, if there is defect of the alveolus.
3. In cases that show angle of rotation and forward drift both.

Summary

The cause of the nasal deformity is the hypoplasia or agenesis of the maxilla and nothing else. If the primary cause, is treated first, the patient will have a normal nose.

Fig. 6

The other deformities are the sequelae of the primary cause, that need correction later on.

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