Maxillary Osteotomy
(DISH-FACE DEFORMITY)

S. S. SETHI

Plastic Surgeon & Asstt. Professor, M.A.M. College & Associated Hospitals; New Delhi

The Dish-face deformity or retruded upper jaw may be a developmental malformation or a displacement of the maxillary fracture, which was once overlooked. The maxillary osteotomies of the lower part of the maxilla are by now standard procedures, but still their mention in the literature is so few and far between.

In 1927, Wassmund (1935) performed a surgical mobilisation of the maxilla to correct the openbite. Axhausen (1934) was probably the first to advance the lower maxilla by osteotomy. Schuchardt (1942) detached the maxilla from the pterygoid plates, and used weights to pull the jaw forwards gradually. Cupar (1954), and Celesnik (1959) corrected openbite by low osteotomy. In 1952, Converse & Shapiro described retromolar segmental osteotomy for a case of malunited fracture with a receding upper jaw. Mohnac (1966) performed segmental osteotomy through hard palate in two stages, and believed that the antrum perforation is inevitable. Hogeman (1967) reported 44 cases of maxillary retrusion corrected by low osteotomy, sectioned through the pterygoid process. The bleeding was encountered and tracheostomy was resorted to as a routine in all cases. Obwegeser (1969) detached the maxillary tuborosity from pterygoid process and inserted a bone graft in the space. We feel the bone graft is not necessary to maintain the advancement. Isolated cases have been published by Furnas (1968), Jobe (1970), and others.

The retruded or retrodisplaced maxilla may have several etiological factors.

1. Hypoplasia or underdevelopment of the maxilla and congenital deformities like maxillary atresia of the cleft palate patient.
2. Malunited fracture of the maxilla.
3. Malformation of the maxilla caused by the trauma in childhood.
4. Pseudoprognathism with Angle Class III malocclusion.
5. Developmental malformation called micromaxillism, where the dental arch requires to be expanded.

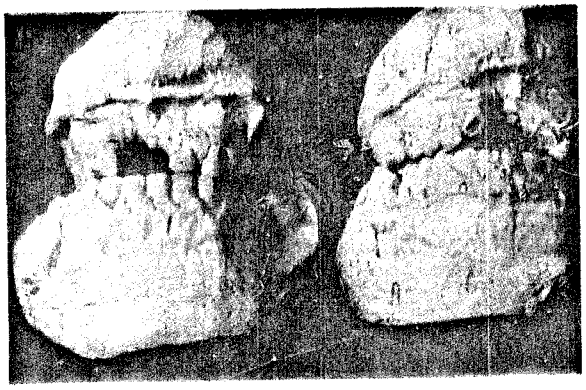
The indications for surgery in these cases may be to improve the appearance, and/or to correct the malocclusion. The indications for the maxillary osteotomy may be listed as follows :

1. Esthetic indication may be the main reason for which a young patient consults.

2. Functional reason is usually given the second place by the patient, and is not the main motivating force in asking for surgery.

A. Mastication : These deformities are usually accompanied by some degree of malocclusion. In our case there was crossbite with Angle Class III malocclusion (Fig. 1 & 2).

B. Freeway : Our patient complained that his voice was changed since after the accident and he slept with the mouth open. The retrodisplacement of the maxilla causes decrease in the freeway of the oro-nasal airspace, and thus change in the speech, or a breathing difficulty.



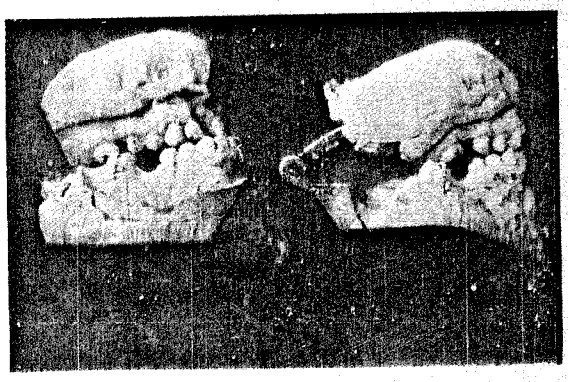


Fig. 1, 2—Front and side views of the plaster casts models to show occlusion. On the left is the preoperative occlusion, and the models on the right, show the corrected occlusions after moving the whole maxilla forwards.

3. Psychic problems in a young adult may necessitate the surgical correction.

4. Social problems : The facial deformity may place him at a disadvantage in a professional career. The malocclusion is likely to restrict the type of his diet, making him dependent. Our patient had a crossbite and could not eat any solid food, especially the nonvegetarian diet which he so relished.

The low maxillary osteotomies are performed along the classified lines of Le Fort I fracture. The occlusion may be normal or with Angle Class III malocclusion, crossbite, or openbite. The occlusion is studied by plaster model casts. The profile of the face is studied by radiograms and cephalograms (Hogeman 1967). The fragments are planned to be moved depending on the occlusion, the patients' wishes and the surgeons' judgement and intuition. After osteotomy the fragments are immobilised into the preoperatively planned position by a properly designed metal cap splints (Fig. 3). The various low osteotomies may be for the advancement or recession of the whole or the part of the maxillary arch. They may be classified as follows :

1. Complete Transverse Osteotomy : to produce Le Fort I fracture and the whole of the arch is advanced.

   A) Detachment of the pterygoid plates from the maxillary tuborosity, which

moves the soft palate along the maxilla forwards. This is a comparatively easier procedure and has been done in our case.

B) Retromolar Osteotomy : is performed through the hard palate anterior

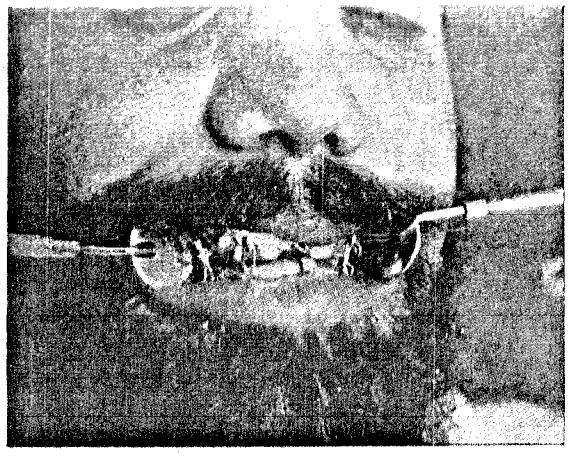


Fig. 3—The metal cap slints are in position showing the intermaxillary fixation achieved after osteotomy.

to the greater palatine foramen, and leaves the soft palate with its attachments to the hard palate intact. This procedure is indicated in the cleft palate patients, so as to avoid any increase in the velopharyngeal incompetence. It is termed as retromolar segmental osteotomy by Converse & Shapiro (1952).

2. Segmental Advancement Osteotomy : envolves a part of the dentoalveolar portion of the upper jaw. The posterior or molar occlusion is acceptable.

A) Premolar segmental advancement osteotomy is at the premolar region, with the cancellous bone graft between the fragments (Converse, 1964).

B) Subnasal segmental osteotomy is similar to the premolar osteotomy, without modifying the position of the nasal spine.

C) Dentoalveolar osteotomy envolves one or more teeth along with the sufficient bone and soft tissue attachment.

D) Cortical osteotomy envolves only the cortex at the base of the dentoalveolar process, thus weakening the bone, and helping the orthodontic procedures to complete the expansion rapidly.

E) Interdental osteotomy has been described between the two teeth and thus avoid the sacrifice of a tooth at the osteotomy site.

3. Expansion Osteotomy : The two halves of the maxillary arch are sectioned through the hard palate, along with the low osteotomy in micromaxillism (Obwegeser, 1969). It is facilitated by the cleft in the cleft palate patient.

4. Recession Osteotomy : is the surgical setting back procedure for the maxillary protrusion at the premolar region. The vertical recession is performed at the premolar and molar region (Schuchardt, 1959). The reverse procedure is done for the posterior openbite.

Case-Report :

M. aged 25 years, had an automobile accident two years before he consulted us for the first time in December 1970. In the accident he had sustained multiple frac-

tures of the extremities and the fracture of the upper jaw. The later fracture was probably thought of minor importance and was left untreated. These injuries were looked after in the orthopedic department. He had intramedullary nail in the right femur. While a second anesthesia was being administered for arthrodesis of the right hip joint, he developed cardiac arrest and was revived by the cardiac massage.

He seemed to be very keen to have his appearance improved, and was worried about his problem and difficulty in chewing his food.

His appearance was studied on photographs to see his profile (Fig. 4), which

Fig. 4A B—Preoperative photographs of the patient, the front and the side views, the lower lip and the nasolabial folds are prominent.

Fig. 5A, B—Postoperative photographs of the patient, the front and the side views, showing the upper lip and the nose moved forwards, and the nasolabial folds are less prominent.

was also studied on lateral radiograms (Fig. 6). The upper jaw required to be moved forwards for about 1.5 cm. along

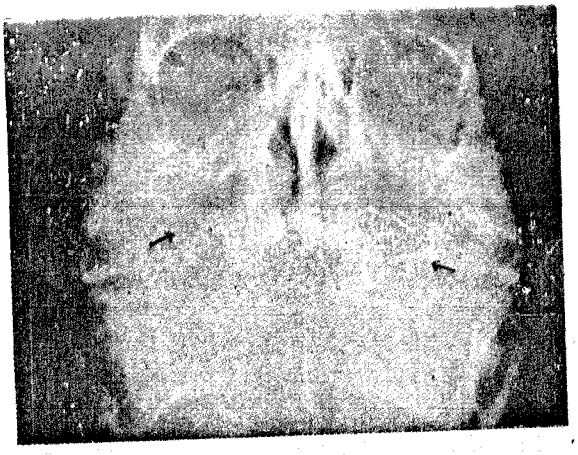


Fig. 6A—Preoperative radiograms, of the maxilla showing the old malunited fracture.

Fig. 6B—Preoperative radiograms, lateral view, showing the relation of the upper jaw to the lower jaw.

with the correction of the crossbite, to get him a satisfactory occlusion.

Operative Procedure : (Fig. 8)

The general aneasthesia was induced through an oral endotracheal tube. Through the intraoral approach the pyriform margin and the floor of the nose was exposed sub-

Fig. 7—Postoperative lateral radiogram showing the maxilla as a whole has been moved forwards, at the region of the pyariform margin. The osteotomy site is seen at the pterygoid region.

periosteally. The nasal septum was detached from the floor of the nose through its entire length up to its posterior border in the nasopharynx. The lateral wall of the nose was sectioned at its base. At this stage, the aneasthetist changed the oral tube into the nasal endotracheal tube. This

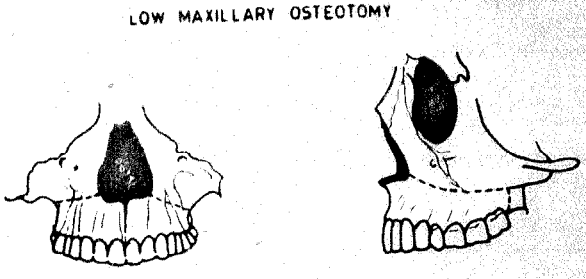


Fig. 8—Dotted lines indicate the osteotomy site. It has been shown too low anteriorly in the diagram. Posteriorly it is between the maxillary tuborosity and the pterygoid plates.

seemed to be a difficult procedure for the anaesthetist, and we would like to do the whole procedure through the nasal tube, henceforth. The anterior and lateral walls of the maxilla were sectioned from the pyriform margin upto the maxillary tuborosity just below the level of the infraorbital foramen. The maxillary sinus was not opened at all. A sharp osteotome is inserted between the maxillary tuborosity and the pterygoid plates, and their attachment was broken loose. Thus the whole of the lower maxillary segment was loose and mobile, and could easily be brought forward even upto 2.5 cm. The mucosal wound was sutured. The upper jaw and the lower jaw splints were fixed to the respective dental arches, and also by the circumzygomatic suspension wires, and the mouth was closed by the intermaxillary fixation between the metal splints (Fig. 3). This fixation was maintained for six weeks. We do not advocate bonegraft in the pterygoid region, but bonegraft may be used around the pyriform margin to further improve the contour. In the postoperative period there was puffiness of the face and a little bleeding from the nose on the fifth and sixth day, and was of no serious concern.

Postoperative Assessment :

The upper lip and the alar bases have been advanced forwards along with the maxillary dental arch, improving the profile. The patient is able to eat properly the solid food, the crossbite having been corrected. There is change in his speech for the better. He had developed closed nasal speech after the accident, which has now disappeared.

Summary :

A case report is given and discussed, where a low maxillary advancement osteotomy is done for a malunited maxillary fracture causing dish-face deformity with malocclusion. The indications and classification of the low maxillary osteotomy are discussed.

Acknowledgements :

I am thankful to Dr. Inderjit Singh, our dental colleague, who worked on this patient, not only in his prosthetic laboratory, but looked after him throughout. Without him this operation could not be possible. I am grateful to Dr. J.L. Gupta for his permission to utilise the facilities of his department, as well as his kindness.

REFERENCES

1. Converse J. M. and Shapiro, H. H. : Plast. & Reconst. Surg., 10: 473, 1952.
2. Furnas, D.W. : Plast. & Reconst. Surg., 42 : 378, 1968.
3. Gillies, H.G. : Fractures of Facial Skeleton, Rowe N. L. & Killey H. C., E. & S. Livingstone Ltd., Edinburgh, 1955.
4. Hogeman, K.E., and Willimar, K. : Trans. fourth Int. Cong. Plast. Reconst. Surg., Excerpta Medica Foundation, Amsterdam, 1968.

5. Jobe, R. P. and Laub, D. R. : Plast. & Reconst. Surg., 46 : 252, 1970.
6. Mohnac, A.M. : J. Oral Surg., 24 : 305, 1966.
7. Schuchardt, K. : Trans. Second Int. Cong. Plast. Reconst. Surg., E. & S. Livingstone, Edinburgh, 1959.
8. Obwegeser, H.L. : Plast. & Reconst. Surg., 43 : 351, 1969.