

A PROSTHETIC APPROACH TO MAXILIARY DEFECTS

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Summary

The literature on maxillary obturators is briefly reviewed and a technique for their construction, using a two stage temporary obturator, is described.

Prosthetic rehabilitation of Maxillary defects is a subject which has attracted considerable attention in dental literature. Credit for the first proper description of a palatal obturator is due to Ambroise Pare' (1509-1590). Pierre Fauchard (1678-1761), the founder of modern scientific dentistry, devoted a large portion of his celebrated work "Le Chirurgien Dentiste" to a detailed consideration of maxillary prostheses (Lindsay 1946). Subsequent major advances in this field of dentistry were closely associated with the discovery of more suitable dental materials. Despite its shortcomings the potential of vulcanite as a maxillofacial prosthetic material was fully realized by Kazanjian (1915; 1934) who did much to improve the design of complex intra-oral appliances.

Methyl methacrylate completely replaced vulcanite for intra-oral prosthesis by the late 1930s. Its main disadvantages, hardness and rigidity, are in some ways compensated by the durability (Bulbulian 1964). It is to this day in almost universal usage. In recent years the softer plastic materials, despite their lack of durability, have come to play an important role in the construction of various intra-oral appliances (Storer 1963).

Acquired defects of the maxillae may occur as a result of an inflammatory process (eg. the gumma of tertiary syphilis), a traumatic incident, or, what is more common these days a neoplasm. Surgery

for a neoplasm in this region may be relatively minor but, occasionally a mutilating procedure. Osteonecrosis is a rare event in the maxillae. Irrespective of the degree of surgery, the patient benefits from prosthetic rehabilitation. Surgical reconstruction of maxillary defects is rarely contemplated; the use of a prosthesis is in any event preferable during the period when recurrence is more likely (Coffin 1964).

Temporary Obturators

The use of a temporary obturator is now generally recognised as essential immediately following maxillary resection (Kruisbrink 1959). Geddes (1969) favours its insertion at operation but some authorities recommend a waiting period of seven to ten months (Appleman, 1952; Scannell, 1965).

The essential functions of a temporary obturator are:

1. To restore facial contour.
2. To limit the formation of cicatricial tissue.
3. To prevent contamination of the surgical cavity.
4. To allow for the ingestion of food by providing a reasonable degree of mastication and deglutition.
5. To allow for normal speech.
6. To act as an applicator for a skin graft or surgical dressing.
7. To prevent the patient from realizing the true extent of the deformity.

Prior to operation two identical plates are constructed in clear acrylic (*Fig 1*). Posterior bite blocks are recommended in place of teeth; balanced articulation and thus stability are easily achieved. This

plate has to be worn continuously for two or three weeks post operatively and every effort must therefore be made during its construction to ensure comfort by preventing undue irritation of the mucosa and by obtaining a maximum degree of retention and stability.



Fig. 1

One of the two acrylic plates is placed overnight in a 1% cetrimide solution prior to use in the theatre. At the termination of the operation and with the patient still under anaesthesia, the mouth is examined and any additional surgery which will aid subsequent construction of a permanent prosthesis is suggested. The acrylic plate is rinsed in sterile saline prior

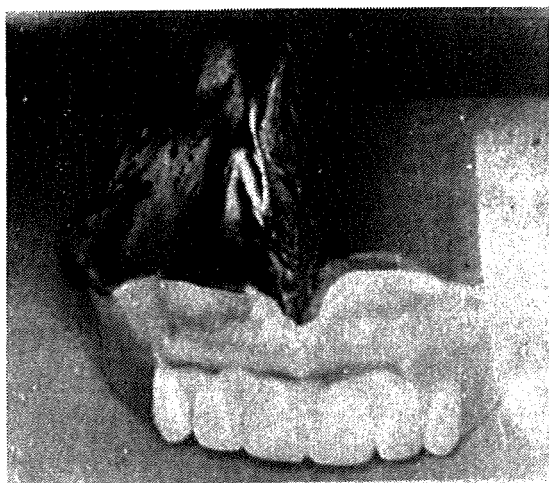


Fig. 2

to insertion and the posterior border is adjusted to extend 5mm beyond the boundary of the defect, if this involves the soft palate.

The intra-maxillary portion of the obturator is fashioned in black gutta percha (Fig. 2). This is painted with liquid paraffin to facilitate insertion and prevent any surgical dressing from adhering to it. The facial contour is overbuilt in order to allow for the inevitable subsequent contracture. If an extra-oral flap has been raised, as in the classical operation for removal of the upper jaw (hemi-maxillectomy), the temporary obturator is positioned before suturing of the flap. If this step is not followed, rupture of the suture in the mid-line is likely to result.

When the surgical cavity has not been skin-grafted, it is examined under a general anaesthetic on the seventh post-operative day. This opportunity is taken to withdraw the first obturator and insert a similar one making use of the second acrylic plate. On this occasion the extension of gutta percha into undercut areas is limited to allow removal of the appliance without pain. This temporary obturator is worn by the patient for a period of up to two months when a permanent appliance should be constructed.

The first obturator provides an excellent impression of the surgical cavity, a stone model is cast and used for the construction of a special tray in connection with the permanent obturator.

The Permanent Maxillary Obturator

The construction of a permanent appliance is started when the surgical cavity has healed completely. This period varies with the individual patient but is usually in the region of two months after operation. Skin grafting after major oral surgery allows for the construction of earlier and more comfortable prosthesis; this practice is, however, not as common as would be expected.

Recognizing the problems of bulk and weight associated with a prosthesis for a large maxillary defect, Appleman (1951) suggested the use of an acrylic hollow bulb obturator. Nidiffer and Shipman (1957) subsequently described a simplified

technique for the construction of a similar type of appliance and pointed out that the inherent lightness prevented any gross changes in muscle balance. Coffin (1964) makes use of a simple open design as opposed to a closed bulb.

Payne and Welton (1965) suggested the use of a rubber latex balloon attached to a denture, to overcome the problems of retention. The balloon is inflated after the denture is inserted. The rapid ageing process of latex (Matthews 1942) is a distinct disadvantage. The advent of the resilient denture base material has minimized the problem of retention.

The final impressions for the construction of an obturator are taken in alginate. Paraffin gauze is used to prevent the extension of the impression material into inaccessible regions. This point is of particular importance when dealing with small palatal defects communicating with the antrum.

Two major functions of a permanent prosthesis are the establishment of an effective oro-nasal seal and the restoration of facial contour. With these in mind an obturator base is constructed and tried in the patient's mouth and any necessary additions made in green stick composition and subsequently processed in acrylic. This phase of construction is vital as a muscle trimmed alginate impression does not allow for the precise building out of facial form. Radical modifications (Fig.3) may be necessary to achieve an acceptable

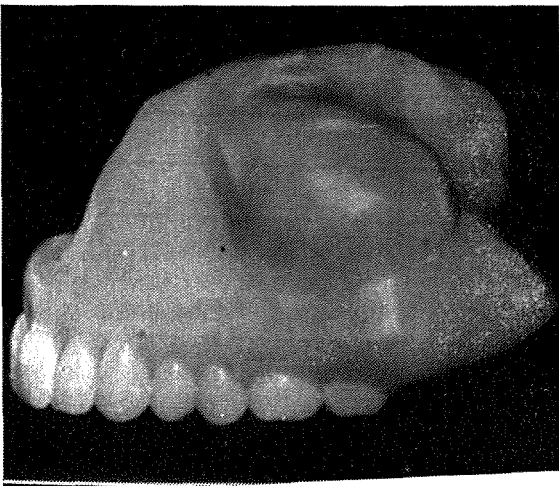


Fig. 3

result. When the defect involves the soft palate, it is necessary to obtain some degree of composition of the soft tissue at the periphery of the defect in order to have a functional oro-nasal seal. Again alginate does not achieve this and a muco-compressive impression technique employing composition is indicated.

As far as retention is concerned, surprisingly little trouble is experienced with the large hollow bulb obturator and this also applies to the simple open obturators described by Coffin. Smaller defects, however, which do not allow for the construction of a bulb or a lateral extension often give rise to concern. In such instances the less durable resilient denture base materials are recommended (Fig. 4, 5).

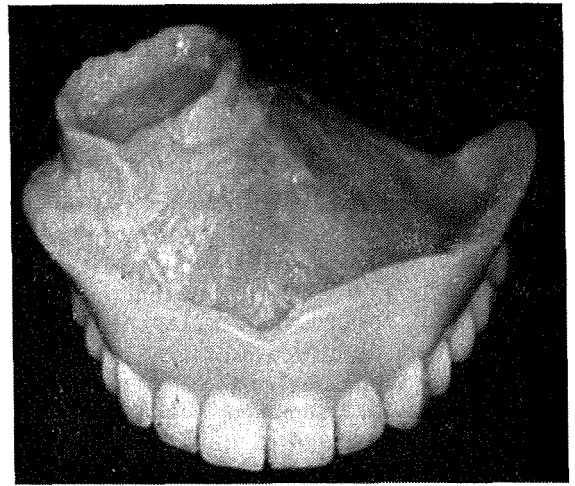


Fig. 5



Fig. 4

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