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Interim Obturator Retained by an Extraoral Device: A Clinical Report

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Abstract

This clinical report presents the treatment of an unfavorable bilateral maxillary defect with the use of an extraoral device to hold an interim obturator in place during tissue healing and maturation.

Patients with acquired surgical defects of the maxilla pose difficult prosthetic rehabilitation, especially if these defects are under the category of being anatomically unfavorable.[1] Acquired defects of the maxilla predispose the patient to hypernasal speech, fluid leakage into the nasal cavity, impaired mastication, and in some cases, cosmetic deformity.[2] The rehabilitation of the patient depends on the limits of the surgical defect and magnitude of the ablative procedures.[3,5,6]

The prosthetic rehabilitation has been divided into three phases (surgical, interim, and definitive), all of which have the primary goal to restore and maintain oral function from the initial postoperative period through healing and organization of the wound.[2] After removal of the surgical obturator and placement of the interim prosthesis, patients must sometimes contend with a nonretentive prosthesis, which may affect the overall psychological attitude during the recovery period.[1,4,9]

Clinical report

A 72-year-old white female patient was evaluated preoperatively, prior to surgical resection of an advanced squamous cell carcinoma ($T_4N_{2a}M_0$) of the middle of the hard palate. The patient was partially edentulous and had no previous experience with dentures.

The operative procedures consisted of a subtotal maxillectomy, with preservation of the turbinates, and immediate insertion of a surgical obturator made with orthodontic acrylic resin (Dentsply Caulk, York, PA). After 7 days, the initial surgical obturator and dressing were removed. Modification of the surgical obturator with a soft lining material resulted in minimal engagement of the posterior lateral wall of the defect for retention. As a consequence of the surgical procedure performed and the anatomical contours of the defect, the retention, stability, and support of the obturator were compromised (Fig 1).

Procedures

An interim obturator with an external fixation device was designed. The following materials were used for the fabrication of this interim obturator: modified high-pull headgear (3M Unitek, Monrovia, CA), lateral adjustable loop straps, an anterior arch wire, and a clear maxillary obturator base (Fig 2).

The clear obturator base was made from the duplication of the modified surgical obturator with a silicone putty material (3M ESPE, Minneapolis, MN). The obturator base was tried in the patient's mouth, while adjustments of the peripheral extensions were made and built to height with soft lining

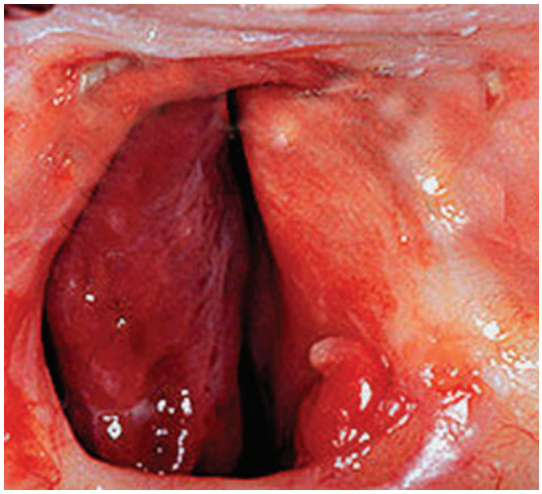

Figure 1 Clinical view of remaining anatomical structures after subtotal maxillectomy. Note: Right inferior turbinate visible, preventing extension of impression and obturator superiorly.

material (Coe-soft; GC America, Alsip, IL) for better adaptability (Fig 3). The obturator base was held in place in the patient's mouth, and two marks were made on each side of the base for proper positioning of the arch wire component. Two lateral grooves were then made in the base into which the arch wire arms were fitted and fixed with autopolymerizing acrylic resin (Fig 4).

The headgear was assembled, and the arch wire lateral extensions were bent superiorly to accommodate for the inclination of the remaining maxillary structures. This lateral extension engaged the lateral loops to a level where the obturator base no longer needed to be held by finger pressure, but was supported completely by the extraoral device (Fig 5).

Evaluation of the patient's comfort and performance took place during the appointment until the patient was able to effectively swallow and speak.

Regular follow-up evaluations provided opportunities for adjustments during the healing of the wounds. The patient comfortably wore the interim obturator for 8 months during the postoperative and wound healing phase. Her speech, swallowing, palatal competence, and appearance were satisfactory.

Discussion

The fabrication of an interim obturator for an unfavorable oral defect can be very difficult, because the anatomical structures needed for adequate fabrication of a conventional prosthesis may be either compromised or nonexistent.

Retention in this particular case was a problem. According to Desjardins,[7] there are five intrinsic areas within and around the defect that can provide retention for the obturator. These areas include: the residual soft palate, the residual hard palate, the anterior nasal aperture, the lateral scar band, and the height of the lateral wall. In this case, none of the five areas for prosthesis retention were adequate, severely limiting obturator engagement. Also, as a consequence of the ablation, the patient lost lip support, which, if not addressed properly at this early stage,

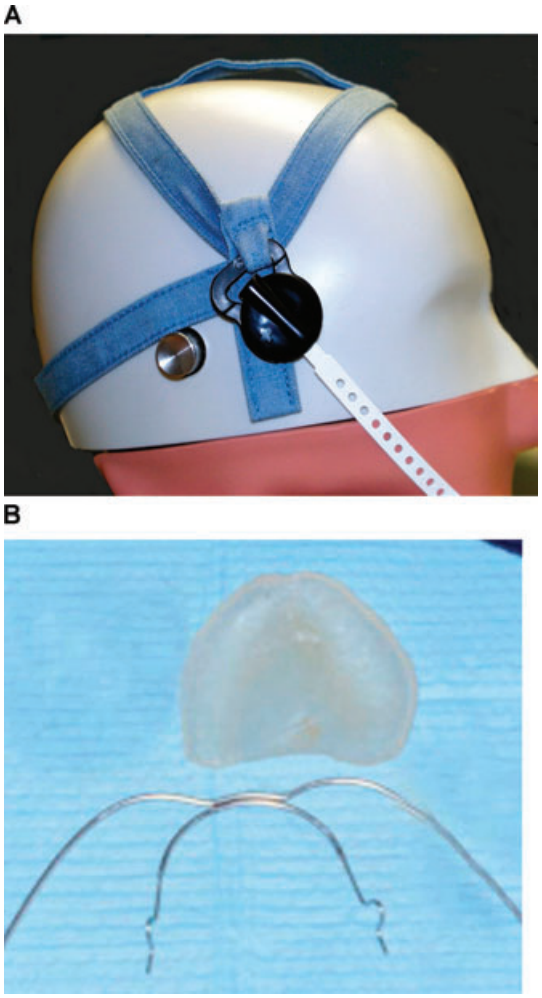

Figure 2 This treatment used a high-pull headgear device with adjustable loop straps (A) and anterior arch wire and maxillary obturator base (B).

would result not only in a cosmetic problem but also a functional problem due to lip retraction. To achieve the prosthetic goals mentioned in the literature by several authors,[2,7,8,10,11] a decision was made to use an extraoral device to hold the

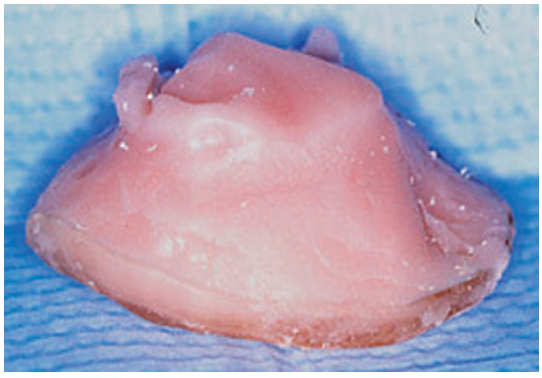

Figure 3 Interim obturator base, built with acrylic resin and soft lining material to fit anatomical structures.

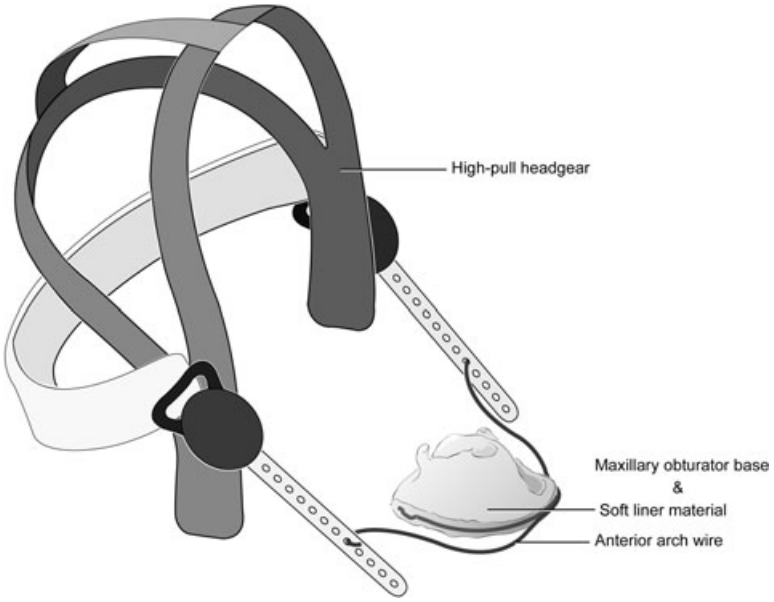

Figure 4 Diagram of assembled modified high-pull headgear with maxillary obturator base. Note: Lateral arch wire on the acrylic resin portion of the base.

obturator base in place. Other treatment recourses tried, such as denture adhesives, proved to be ineffective.

As dental records made before the surgery were not helpful due to dramatic changes in the anatomy following surgery, a duplicate of the tissue side of the surgical obturator was made for the ease of fabrication of what would be the new base. The periphery of the new base was adjusted to the patient's comfort level. The advantage of using soft lining material for the intaglio surface of the interim obturator, as stated by Jacob et al,[12] is that it can be used not only as impression material but also as an integral part of the interim obturator. The resilient property of the soft lining material was favorable for tolerance of the prosthesis against the defect while tissues were healing.

The extraoral retention device was a high-pull headgear modified with a posterior strap for additional support. This appliance, when assembled, did not apply significant tissue contact force; the only function was to retain the obturator during speech and nourishment. The advantage of using the anterior arch wire was that the lateral extensions allowed adjustment away from the patient's skin; it also helped accommodate the angulation of the remaining tissue structures.

The patient was instructed on how to assemble the extraoral components, and even though the appliance was not esthetically pleasing, it did achieve the prosthetic goal during the initial postoperative period.

The patient accepted the appliance as a temporary solution, an interim step leading to the completion of the rehabilitation with two maxillary dental implants and a maxillary overdenture, opposing a mandibular conventional denture.

Figure 5 Front and lateral view of patient with obturator held in place by the modified high-pull headgear.

Summary

The rehabilitation of a bilateral unfavorable maxillary defect is challenging. As shown in this report, the patient benefited

from the use of an extraoral device during the interim phase of healing. Problems relating to retention, speech, nourishment, and cosmetics were improved by providing adequate support during the healing process.

Acknowledgment

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