

Rehabilitation of an Extraoral and Intraoral Defect Complicated with Microstomia. A Study Case

L.M.Abdulhadi*

Abstract - A 72-year-old man was referred from the surgery department for rehabilitation following surgical resection of Basaloid carcinoma. The first surgical intervention involved the anterior palatal region and was restored with a simple obturator. Two years later further surgery was undertaken to excise a recurrent tumor in the nose and part of the cheek. This resulted in an exposed nasal cavity and maxillary sinus. In addition, there was a small oral aperture composed of thin tissue that stretched to its maximum due to scar formation. The defect was restored with a full thickness skin flap but it subsequently broke down leaving the midface exposed with limited mouth opening due to tissue contraction and scar formation after the flap operation. The defect was rehabilitated with Co-Cr obturator intraorally and a silicone nose retained to the naso-palatal extension of the obturator by a magnet extraorally. This resulted in practically good retention, placement, and adaptation of the two parts of the prosthesis

KEY WORDS: Epithesis, Anaplastology, Nose Replacement, Intra-Extra Oral Replacement, Microstomia, Magnetic Connection

INTRODUCTION

Basoloid Squamous cell carcinoma (BSCC) of the oral cavity is a rare variant of Squamous cell carcinoma (SCC). It shows similar association to alcohol consumption and smoking as SCC. It is mostly seen at the supraglottic larynx, the base of tongue, pyriform sinus, and palatine tonsils. Some cases have also been found in the nasopharynx, the floor of the mouth, oral cavity, palate, and nasal cavity. For the treatment and prognosis, no systematic evidence-base studies have been made. The review of literatures revealed that the treatment of patient with BSSC is commonly based on surgical resection, followed by radiotherapy, chemotherapy or both ¹⁻⁵.

Combined intra and extra oral defect when complicated by exposed sensitive tissue and microstomia results in a challenging clinical situation⁶. This clinical condition is challenging for the clinician as well as the patient, especially when the defect is big and retention is difficult to obtain. Depending on the nature and extension of the defect the combined extra-intraoral defect may be rehabilitated using individual prosthesis ⁶ or they may be joined by the use of powerful earth rare magnets ⁷, precision attachments, or special modification in the acrylic structures of the obturator and the episthesis to gain retention by undercut engagement or the use of frictional connection. Some other practical issues include the complicated, stressful impression procedure for the patient, the necessity to modify optimum placement of the connection mechanism, the potential extraoral prosthesis movement during function and irritation to the fragile tissue boundaries around the defect. The purpose of this case report was to demonstrate a direct fabrication technique (chair side) for prosthetic

rehabilitation of an extraoral and intraoral defect combined with microstomia using rare earth magnet to hold the extraoral prosthesis.

Case presentation

A 72-year-old man was referred to the to the Department of Prosthodontics to restore his midface defect which involved the antero-lateral part of the palate and the upper lip after excision of (BSCC) of the nasomaxillary region. The intraoral defect had been restored after the first palatal resection using Co-Cr partial denture obturator to close the anterior naso-oral communication. Two years later a new resection was performed to excise the nose and part of the cheek leaving the nasal cavity and maxillary sinus completely exposed. In addition, the mouth opening was very small and composed of thin tissue that stretched to its maximum on opening due to scar formation and contraction after the operation. Post surgery, the area was treated by radiotherapy. The defect was partially reconstructed with a rotation pedicle flap that broke down (according to the history given by the patient) (Figure 1, A, B). Intraoral examination revealed the loss of right central and lateral incisors, canine and the first and second bicuspsids. The remaining teeth were in good condition. The defect area was in semi-lunar form that extended from the midline anteriorly following the midline along the palate to reach nearly the mesial proximal aspect of the right first molar.

Treatment

Many treatment options were discussed. The first option was to construct a separate extraoral prosthesis supported by two or three osseointegrated implants connected by a Dolder bar. This choice was excluded because of the irradiation history, limited bone thickness, the patient refusal for any further surgical intervention together with the high cost. Therefore, the decision was to prescribe a new

* BDS, CES, DSO

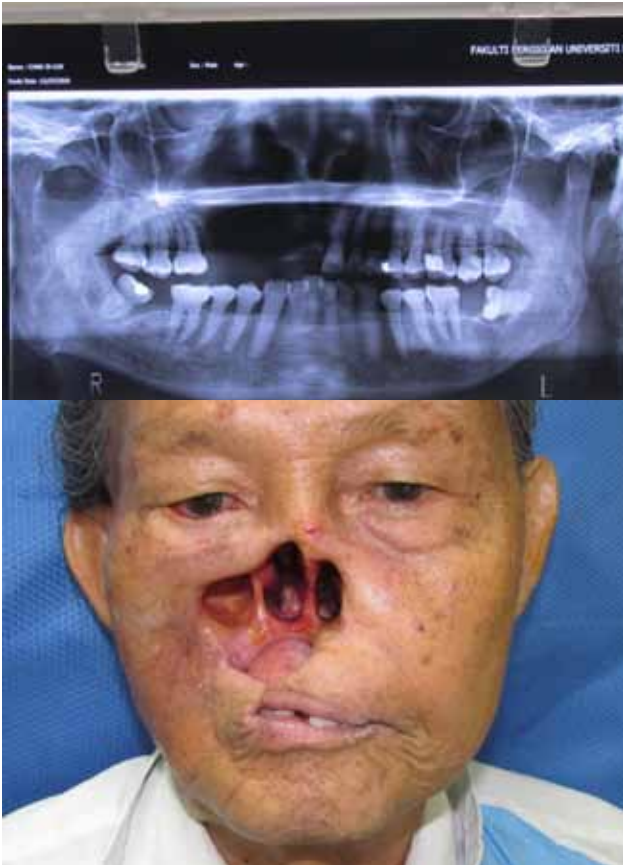


Figure 1 A. OPG of the patient before the rehabilitation B. The external defect



Figure 2. The final sectional impression

obturator made of Co-Cr in order to restore the intraoral defect and an extraoral silicone prosthesis supported by an acrylic base and joined to the obturator using rare earth magnet (Indigo instrument, 169 Lexington Court, Unit Waterloo , ON). The primary impression for the intraoral maxillary defect was made using sectioned perforated stock try and putty silicone (Virtual 380 Ivoclar Vivadent AG Bendererstrasse 29494 Schaan). The two impression pieces were poured using dental stone (Heraeus Kuzler Corp., Hanau, Germany). The cast halves were spaced by one layer modelling wax and light cured acrylic resin was applied to make two half-special tray. The final impression was made using irreversible hydrocolloids (Kromopan 100 hours Hydrocolloid dust free iso 1563 class A type1. Italy)

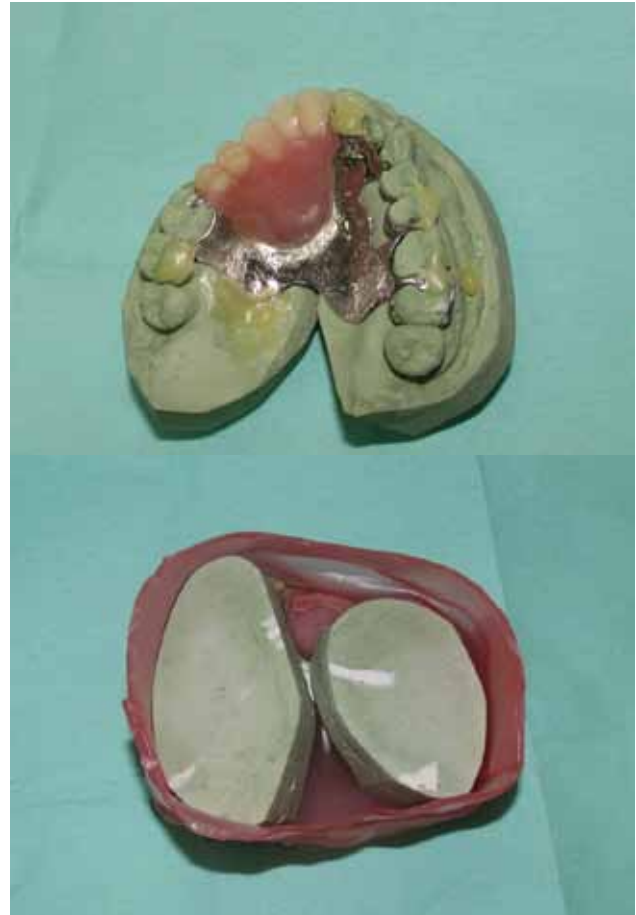


Figure 3. Assembling of the two cast halves and boxing of the assembled parts of sectional cast using the old obturator as index

and sectional acrylic individual tray ⁸ (Figure 2). The two-half impression excess were cut, refined and smoothed so that there was no interference with each contra lateral part. The old broken Co-Cr obturator was used to align and fix the two halves of the maxillary arch correctly one to each other. Then, the assembled casts were beaded, boxed and poured in the normal way to produce one working cast (Figure 3). To check the alignment precision of the working cast, an acrylic base was fabricated on the working model and tried for ease of insertion and fit inside the patient mouth (Figure 4). The adaptation of the base was perfect without the need of any modification. The metal framework was designed and casted into Co-Cr alloy (Wironit, Bego, Germany) taking into consideration the restricted mouth opening (Figure 5). The mandibular impression was made using the same sectional impression technique but with an index use to align the two sections of the impression.⁸ The patient was accustomed to use his tongue to oral seating of the obturator. The same technique was used to insert and remove the new prosthesis. The other fabrication procedures (such as cast correction, undercut block, duplication, investment, spruing, and casting were similar to a normally constructed, simple metallic obturator. The obturator was finished in the normal way starting by metal frame checking, maxillomandibular records, teeth setting, try-in of the waxed try-in obturator, flasking, wax elimination and processing into heat-polymerized acrylic resin. The finished obturator was inserted into the patient's mouth and any occlusal interference or over extension causing



Figure 4. The working cast and the acrylic resin base



Figure 5. The Cr-Cr obturator RPD framework

sore spots were corrected. The nasopalatal extension of the obturator was modified so that a circular earth rare magnet (20 mm x 2 mm) could be attached using auto polymerized acrylic resin (Probase Cold, Ivoclar Vivadent AG Bendererstrasse 29494 Schaan). Modelling wax was softened and adapted to the nasopalatal extension of the obturator and the surrounding defect boundary and then transferred into clear acrylic resin to hold the keeper for the magnet (Figure 6,A,B). The base of the external prosthesis was checked and corrected for retention, adaptation and any overextension or pressure area near the periphery of the defect boundary. Two holes of 1 cm diameter for



Figure 6. A, B Fixation of the magnet inside the nasopalatal extension of the obturator and the relation to the nose sub- silicone base



Figure 7. Try-in of the waxed nose

airflow were opened inside the acrylic base and checked for ease of airflow and patient comfort during respiration. The keeper was fixed on the base against the magnet in the nasopalatal extension of the obturator. The nose was sculpted using modelling wax that added layer by layer to the acrylic base and checked for adaptation to the skin and remaining peripheral tissue around the defect (figure 7). The silicon colour was selected and checked many times in different light conditions until acceptable skin colour matching was achieved. The waxed nose and its base was flaked using plaster of Paris. After wax elimination, the medical-grade silicone (Episil, Dreve Dentamid



Figure 8. The finished silicone nose and obturator inside the patient mouth



Figure 9. The finished nasal silicone with its substructure base and keeper

Unna, Germany) was prepared with the selected tint and other additives to match the skin colour and consistency. A layer of acrylic primer was applied to the surface of basal structure of the nose. The silicone was packed inside the mould using a paintbrush and the flask parts were closed and cured following the manufacturer's instructions. Then, the flask was opened and the silicone excess removed, cleaned, and prepared for the external colour make up. The result (Figure 8, 9) was excellent regarding the retention, placement, and adaptation of the two parts of the prosthesis.

DISCUSSION

The primary objective of prosthetic rehabilitation was to help the patient to return into normal life by restoring the defect using functional prosthesis that could protect the exposed sensitive tissues and structures from the external environment. Secondly the epithesis provides an acceptable aesthetics and psychological benefit to the patient^{6,9}.

Generally, clinical situation like microstomia complicate the rehabilitation procedures as they necessitate changes in treatment planning and prosthesis design and additional time is needed to cope with these difficulties. The sectional impression technique successfully overcame the difficulties in introducing the tray into the patient's mouth and making useful impression with minor patient discomfort. However, if a sectional design of the prosthesis is also needed treatment will be complicated and therefore, a simple one-piece design in this case prevented further complication. The direct technique of extraoral epithesis fabrication simplified the procedures of treatment starting with the construction of the acrylic resin substructure of the facial part of the prosthesis without the use of any impression, placement of the retention mechanism and proper adaptation to the tissues around the defect. This method permitted direct placement of the magnet and its keeper accurately with the possibility of immediate correction of the magnet-keeper location in relation to the seating and better margin adaptation to the remaining structure. The nose and cheek were also sculpted and checked on the defect immediately to correct or to modify for any necessary tissue changes. This procedure may be repeated as many times as required without the necessity to make any facial impression, until acceptable result is obtained.

The remaining healthy teeth provided direct retention for the obturator and indirectly for nasal prosthesis via the magnet even when the external prosthesis is relatively heavy. In normal situations, prescription of one-piece appliance enhances the predictability of the treatment, as it is usually more convenient for the patient to control one-piece prosthesis if it can be inserted successfully. In this case, the patient was very helpful because he was accustomed to using his tongue to rotate the old prosthesis into position with just a little help with his fingers. This manoeuvring allowed the construction of one-piece obturator. Therefore, the fabrication was simplified, the cost reduced, and the prognosis was enhanced compared to two-pieces obturator.

CONCLUSION

Overall the patient accepted the prosthesis well and expressed satisfaction particularly because of the absence of embarrassing and complicated facial impression procedures. Later, the patient experienced some movements of the epithesis following early wear of the abutments and reduced retention of the obturator. There were some other minor difficulties resulting from the impossibility to using the extraoral prosthesis alone and so other retentive options like the use of eyeglasses frame or biologic adhesive to resolve this problem could have provided alternatives, perhaps for a second prosthesis

ADDRESS FOR CORRESPONDENCE

Laith Mahmoud Abdulhadi,BDS,DSO. Department of Prosthetic Dentistry, Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia. Email:laithabdulhadi@um.edu.my

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