Microstomia in a maxillectomy patient: A prosthetic challenge

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Abstract

The provision of a satisfactory denture in case of reduced stomal inlet has always been a trouble for the patient and a challenge to the prosthodontist. Fabrication of complete and removable partial denture prosthesis requires accurate diagnostic impression and diagnostic casts for the development of custom trays and final impression. The decreased mouth opening, technically called “Microstomia,” poses problems in tray selection, impression making, jaw records and denture insertion. The causes for microstomia are numerous, one major cause being the after-effect of radiation therapy. Whatever the cause, the ability to make impressions and jaw records becomes taxing. A variety of impression techniques using modifications in the nature of the tray and impression materials are required. The present case report highlights an innovative and different aspect of impression making and fabrication of an obturator prosthesis for a microstomotic patient who underwent maxillectomy.

Keywords: Impression making, maxillectomy, microstomia, obturator

Introduction

The provision of a satisfactory denture in case of reduced stomal inlet has always been a trouble for the patient and a challenge to the prosthodontist. Fabrication of complete and removable partial denture prosthesis requires accurate diagnostic impression and diagnostic casts for the development of custom trays and final impression. The decreased mouth opening poses problems in tray selection, impression making and denture insertion. An impression can be made as long as the maximum oral opening can provide an interarch space that is greater than the size of the impression tray and the lips can be stretched to a width that is equal to or greater than the width of the impression tray.[1]

A variety of impression techniques using modifications in the nature of the tray and impression materials are required. Many authors have advised and advocated sectional custom trays and collapsible denture systems.[2-4]

Case Report

A 45-year-old female patient presented to the Department of Prosthodontics including crown and bridge, MMCDSR, Mullana, Ambala, complaining of inability to chew and swallow food [Figure 1].

The patient was thin-built with normal gait. Facial outlook showed involvement of the left face region with redness and swelling in the left eye. She suffered from oral squamous cell carcinoma and was treated surgically. A partial maxillectomy was performed and the patient was put on radiation therapy. She came to the department 2 weeks after termination of the therapy.

Past medical history

The patient’s medical history revealed problem of breathlessness on walking, but was under no medication presently.

Past dental history

Dental history revealed swelling over the left cheek region with an insidious onset and gradual progression. On examination, the swelling was found to extend to the maxillary sinus, infratemporal fossa and roof of pterygoid. After biopsy, the provisional diagnosis given was oral squamous cell carcinoma. The findings confirmed the disease and the carcinoma was operated 6 months back and radiotherapy completed about 2 weeks back. The patient was under no further medication.

Intraoral examination

The intraoral examination revealed a partial maxillectomy of the left maxillary region [Figure 2]. The situation presented corresponded to Class II defect of Okay’s classification involving a portion of the tooth bearing the maxillary alveolus and including only one canine.[5] The defect was thoroughly packed with gauge. The mandibular arch was dentate with 16, 17, 25 and 26 missing. The tongue function was normal. She had to get the 21, 22, 23, 24, 25, 26 and 27 extracted in the maxillary arch, which were present in the lesion area,
While the 17 was missing. The mouth opening was restricted to just 20 mm, i.e. microstomatic. The patient desired closure of the defect with replacement of missing teeth because of difficulty in chewing and swallowing.

Treatment plan

The treatment plan decided for the patient was an obturator to cover the defect with teeth present to replace the missing ones.

Materials and methods

The defect was thoroughly cleaned and packed with gauge. Impression trays for both the maxillary and the mandibular arch were selected. The mouth opening was much smaller than the size of the smallest dentulous tray, number 0. We chose to use an edentulous perforated tray for the impression. Alginate was the impression material of choice. For the maxillary impression, a wax sheet was added on the dentate side to cover the buccal surface of the teeth and the sulcus area because we intended to give a retentive clasp in that area [Figure 3]. The mandibular impression was also made in an edentulous perforated tray as the main aim was just to get the occlusal surface of the teeth for establishing an occlusal scheme. Impressions were poured in dental stone.

An autopolymerizing acrylic resin tray was fabricated for the maxillary arch, extending across the palatal midline to the dentate side. Border moulding was carried out on the defect side and a zinc oxide eugenol final impression was made. The handle of the tray was then cut and placed in the mouth. An appropriate-sized edentulous perforated tray was chosen and
an alginate impression of the dentulous side was made along with the acrylic custom tray and impression in place. The entire assembly was removed and poured in dental stone. A shellac base plate was adapted over the defect extending to the dentulous side and a wax rim was fabricated over it. Jaw relations were recorded and the casts were then mounted. Teeth setting was performed accordingly and a clasp was given on the canine on the dentulous side to aid in retention of the prosthesis. Try-in was carried out and the patient was asked if she was satisfied. The trial denture was acrylized conventionally and, finally, a finished prosthesis was inserted [Figure 4]. The patient was recalled the very next day, after 2 days and then after a week till she was comfortable eating and speaking with it [Figure 5]. Oral hygiene instructions were given to the patient.

Results and Discussion

The present clinical report describes a situation quite different from those discussed till date. Previous studies have dealt with microstomia in edentulous patients. This situation has been successfully resolved by prosthodontists by using variously modified trays. Geckili et al. devised a sectional impression tray made by measuring the arch width of the patient’s mandible. Moghadam suggested a sectional impression tray for left and right side of the maxillary arch. Luebke used horse shoe-shaped flexible impression trays. Cura advocated sectional impression trays stabilized with pins and resin blocks. In the present case, the microstomic condition was accentuated with a newer problem. The patient had undergone partial maxillectomy to treat oral squamous cell carcinoma leading to loss of the maxillary alveolus and associated teeth. Consequently, the outer vestibular wall and part of the upper lip had collapsed. Adding to the complexity of the situation was the dentulous status of the remaining maxilla and several missing teeth, making the overall picture extremely complicated and challenging. Conventionally designed sectional trays were tried in the present case but failed to produce precise approximation on overlap outside the mouth due to the partial dentulous condition. Efforts had to be made to design, select and investigate impression making with the help of other available trays. Details of this are presented in the report.

It was observed that using an edentulous perforated tray instead of the dentulous perforated tray helped in insertion of the tray into the microstomic condition. Application of a wax sheet to the tray on the dentate side of the arch facilitated flow of impression material to record the buccal surface of the teeth and the sulcus area. This was required to determine placement of the clasp, which would aid in retention for the future prosthesis. The innovative process involving a dual-impression technique helped in obtaining an approximated final impression of the dentulous and defect areas. With these modifications, the final prosthesis was fabricated. This was successfully inserted into the microstomic oral orifice of the patient and presented a perfect fit.

Many authors have designed and advocated sectional custom trays and collapsible denture systems for use for the completely edentulous microstomic patient. The same could however not be adopted in the present situation because of the unique partially dentulous condition presented by the patient on account of partial maxillectomy to treat oral squamous cell carcinoma. The present study, therefore, contributed to resolving this unusual situation by providing improvement in speech and mastication.

It was the patient’s immense cooperation that helped fight this challenge.

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