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Maxillofacial Rehabilitation with an Immediate Surgical Obturator: Enhancing Oral Function, Speech, and Quality of Life – A Clinical Case Report

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ABSTRACT:

The surgical removal of maxillary tissue for tumor treatment creates major functional and cosmetic problems because it breaks down the natural barrier between the mouth and nose. The surgical obturator serves as an immediate prosthodontic solution which enables patients to regain their speech abilities and eating functions and mastication abilities and provides emotional support throughout their initial healing period. The team creates an immediate obturator before tumor removal which they place right after surgery to seal the defect and maintain facial shape and safeguard the surgical area while blocking postoperative contamination.

The paper explains the complete process of creating and placing an immediate maxillary obturator through a detailed description of laboratory and clinical procedures that require surgical and prosthodontic team collaboration. The prosthesis functions to enhance patient comfort while facilitating early functional recovery and acting as a transitional solution for permanent rehabilitation.

INTRODUCTION:- Surgical maxillectomy procedures which treat benign or malignant tumors result in severe functional and esthetic problems because they damage the natural separation between the oral and nasal cavities. The maxilla functions as a vital structure which maintains oral-nasal separation and supports facial structures and enables essential activities like eating and speaking and swallowing and facial aesthetics. Surgical resection of the maxilla creates major postoperative complications because it disrupts the natural anatomical structure which results in substantial patient morbidity that diminishes their life quality. [1,2]

The early stages of rehabilitation for patients who undergo maxillary resections benefit from immediate prosthodontic treatment through surgical obturator placement. The team creates an immediate obturator before surgery which they insert right after tumor removal. The device functions to seal the surgical opening while maintaining tissue support and preventing nasal regurgitation and enabling fast speech development and maintaining facial aesthetics. [3,4]

The early placement of an immediate obturator helps protect the healing process by safeguarding the surgical area while reducing postoperative contamination risks. The surgical team benefits from improved control over defect shapes through the immediate obturator placement which enables them to create better plans for permanent prosthetic treatment. [4]

The construction and placement of immediate obturators requires several clinical obstacles to overcome. The process requires precise surgical defect

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measurement and tight surgical team coordination and stable prosthesis retention in a shifting oral environment. The clinician needs to evaluate the patient's mental state and their willingness to accept a prosthesis right after surgery. [5]

The following case study presents a complete prosthodontic treatment plan for a patient who needed a maxillary immediate obturator after surgical tumor removal. The report demonstrates how prosthodontists lead early rehabilitation and long-term functional recovery through their interdisciplinary work and patient-focused results.

CASE REPORT: A 38-year-old female patient was referred from a regional cancer centre to Department of prosthodontics, Sri Siddartha Dental college and Hospital tumkur for prosthodontic management following the diagnosis of mucoepidermoid carcinoma involving the right maxillary arch. The patient presented with swelling on the right posterior maxillary region (Fig.1), associated with discomfort and difficulty in mastication. Clinical examination revealed a firm intraoral swelling extending from the canine region to the maxillary tuberosity. Radiographic investigations showed involvement of the alveolus and maxillary sinus. Histopathological evaluation confirmed the diagnosis of mucoepidermoid carcinoma.

The patient's medical history was non-contributory, and routine blood investigations were within normal limits. A right-sided maxillectomy was planned by the surgical team. The anticipated surgical defect was classified as Aramany Class II.

Plan of Treatment

In view of the anticipated defect and the need for immediate functional rehabilitation, fabrication of an immediate surgical obturator was planned. The prosthesis would restore oro-nasal separation, improve speech and swallowing, prevent nasal regurgitation, and protect the surgical wound during the postoperative healing phase.

PROCEDURE:

1.Impression:

A preoperative impression was taken using an irreversible hydrocolloid material **(DPI Algitex, Dental Products of India, Mumbai)** in a modified perforated stock tray (Fig.3). This impression was then poured with dental stone (Gyproc, Prevest DenPro, Jammu, India) to obtain a positive replica of the maxillary arch (Fig.4). The resulting cast was forwarded to the surgical team to outline the planned area of resection.

2.Modification Of Cast:

The surgical area was outlined on the cast using a pencil to accurately depict the involved teeth and adjacent anatomical structures (Fig.5). Based on the surgeon's markings, the cast was modified to reflect the planned resection, which included teeth 14 to 17. However, during the actual surgical procedure, tooth 13 was also removed due to intraoperative considerations. Consequently, the prosthesis required adjustment postoperatively to account for the additional missing tooth.

3.fabrication of baseplate

In the immediate obturator , only an acrylic plate was provided without incorporating replacement teeth. This design aimed to enhance patient comfort and promote optimal healing by minimizing occlusal load on the defect side.

Orthodontic ball-end clasps were fabricated using 22-gauge stainless steel wire and adapted between teeth 22 and 23, as well as between the premolars (24, 25) and molars (26, 27) (Fig.6). Modeling wax (Hindustan Modelling Wax No. 2, Hindustan Dental Products, Mumbai, India) was then adapted to the palatal surface of the maxillary arch (Fig.7). The waxed-up prosthesis was subsequently dewaxed and processed using heat-cured clear acrylic resin (Trevalon Heat Cure Dentsply India) (Fig.8). After polymerization, the prosthesis was retrieved, finished, and polished. Finally, it was disinfected using a 0.2% chlorhexidine solution **(Hexidine ICPA Health Products Ltd., India)** prior to insertion (Fig.9).

Fit and Insertion of the Immediate Surgical Obturator:

The placement of the immediate surgical obturator was performed in the operating theater. Once the surgical resection was completed (Fig.10), the obturator was inserted, and its borders were carefully trimmed to ensure a passive fit over the reconstructed flap. This adjustment was done to avoid any irritation or pressure

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on the soft tissue (Fig.11). Following the insertion, A follow-up evaluation was conducted 48 hours later to assess the prosthesis and make necessary refinements to its borders.

DICUSSION:

The construction of a surgical obturator stands as a crucial element for postoperative rehabilitation of patients who have undergone maxillofacial surgeries especially when maxillectomy procedures are involved. The immediate placement of surgical obturators enables patients to maintain oronasal separation while their healing tissues receive support and enables them to perform speech and swallowing functions right after surgery. [6]

Surgical obturators made from heat-cure clear acrylic resin are the preferred choice because they offer excellent mechanical properties and simple workability and safe biocompatibility. The superior strength and dimensional stability of heat-cure acrylic makes it more suitable for intraoral use because it maintains its shape during tissue healing processes better than self-cure (cold-cure) resins.[6,7]

The clear acrylic resin material provides multiple benefits to users. The clear material enables healthcare providers to observe surgical areas through the prosthesis which helps them check grafts and flaps and surgical sites without needing to remove the prosthesis. The early postoperative period benefits from this feature because patients need frequent inspections.[8,9]

The rigid structure of heat-cured resin helps maintain proper surgical site support and keeps surrounding soft tissues in their correct position. The material helps decrease tissue shrinkage after surgery while creating better healing outcomes. The non-porous structure of heat-cured resin prevents microbial growth which leads to improved hygiene and decreased chances of postoperative infections.[10,11]

The process includes several important factors to keep in mind. The rigid nature of heat-cure acrylic requires precise adjustments to prevent damage to sensitive surgical grafts or flaps. The fabrication process requires precise border relief and adaptation techniques to achieve a passive fit that avoids tissue trauma. The treatment of extensive defects and abnormal anatomical structures requires soft lining materials to achieve better patient comfort and additional support. [9]

Heat-cure clear acrylic resin serves as an effective prosthetic solution for surgical obturators because it offers durability and hygiene while delivering clinical success in early postoperative care. The correct fabrication and adjustment of this material enables patients to feel comfortable while their tissues heal and enables them to perform vital oral functions during their essential surgical recovery period.[12,13,14,15]

CONCLUSION: Immediate obturators constitute an integral part of prosthodontic rehabilitation following partial or total maxillectomy. Their primary advantage lies in the rapid re-establishment of oro-nasal separation, thereby allowing the patient to regain essential functions such as clear speech, efficient deglutition, and effective mastication almost immediately after surgery. The device further aids in maintaining surgical dressings,minimizing contamination of the wound, and improving the overall healing process. From a psychological perspective, the prosthesis offers the patient an improved sense of normalcy by reducing functional impairment and esthetic compromise during the early stages of recovery. When planned and executed carefully in coordination with the surgical team, the immediate obturator greatly enhances the quality of life and sets the foundation for subsequent definitive prosthetic rehabilitation.

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Fig.1. Pre operative maxillary arch with lesion

Fig.2. Mandibular arch

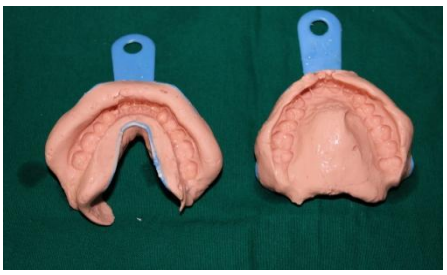

Fig.3. Impression of maxillary arch with lesion and mandibular arches

Fig.4. Casts obtained

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Fig.5. Delineated are of resection on maxillary cast

Fig.6. ball-end clasp adapted

Fig.7.waxed-up prosthesis

Fig.8.waxed-up prosthesis

Fig.9.Final prosthesis

Fig.10.post operative intra oral view

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Fig.11.Final prosthesis