

**ADVENT OF MAXILLOFACIAL PROSTHODONTICS FOR ORO-FACIAL DEFECTS****Dr. Vinita Ved\***

BDS, Mumbai, India.

**\*Corresponding Author: Dr. Vinita Ved**

BDS, Mumbai, India.

Article Received on 25/01/2018

Article Revised on 15/02/2018

Article Accepted on 07/03/2018

**ABSTRACT**

Maxillofacial prosthesis is that field of dentistry providing a replacement to surgical reconstruction of oral and facial defects. Oro-facial defects can lead to several psychosocial issues for the patient, making rehabilitation of vital importance. Aesthetic correction is equally significant as function correction, making a maxillofacial prosthodontics of vital importance. The prosthetic rehabilitation of patients has a noteworthy impact on a patient's self-image and potential to function and interact socially.

**KEYWORDS:** Maxillofacial, prosthodontics, oro-facial defects.**INTRODUCTION**

Maxillofacial prosthesis is that branch of dentistry providing an alternative to surgical reconstruction of oral and facial defects. It can be defined as "the art and science of anatomic, functional or cosmetic reconstruction by means of non-living substitutes of those regions in the maxilla, mandible and face that are missing or defective because of surgical intervention, trauma, pathology, or developing or congenital malformations."

Corrections of oro-facial defects is a very critical matter for both the patient as well as the doctor. These defects can either be congenital or acquired. The former occurring anywhere in the body drastically affecting the life of a patient. The latter can be due to several reasons, including surgical resection of tissue due to malignancy, traumas or assaults. Treatment of such cases no more focuses on survival, but also is dependent on rehabilitation as a crucial aspect of treatment.

Such defects that a patient acquires either from birth or post-natal need to be corrected not only for the functional replacement, but also for psychological and social reasons. They can be corrected either with the help of surgical correction, a prosthetic replacement or combination of the two. Surgery may seem like an interesting solution but it has its drawbacks of failure to handle larger defects having compromised blood supply, and/or the general complications of surgical intervention on older and medically compromised patients. Prosthetic rehabilitation is advantageous in such situations conditioning the overall treatment experience for the patient.

Prosthesis are often required for the restoration of oral functions such as swallowing, speech and chewing, along with cosmetic replacement. Maxillofacial Prosthodontists are customary to working efficiently with ENTs, oral surgeons, general and speciality dentists, psychiatrist, speech therapist, radiation oncologist, anaplastologists and multiple ancillary personnel.

The prosthetic rehabilitation of patients has a noteworthy impact on a patient's self-image and potential to function and interact socially. The aim of the present review paper is to lay light on the prosthetic options available for replacement of these defects, improving the patients overall quality of life.

**DISCUSSION**

Congenital anomalies are a crucial matter, influencing 2-3% of all babies. The World Health Organization advocates that oral clefts are within the most widely known and frequent congenital anomalies, occurring in approximately 1 in every 700 live births. Cranio-facial abnormalities, other than cleft lip and palate, occur 1 in every 1600 newborns approximately. Numerous factors contribute to cleft conditions, the most habitual being mother practicing pernicious habits during pregnancy or some obstruction hampering the normal development of tissues.

On the other hand, acquired defects occurring post-natal, leading to functional as well as aesthetic deformities. They can be caused as a result of vivid reasons, with road traffic accidents, assaults, falls, occupational trauma and sports injury being among the most common.

The World Health Organization has estimated that more than 3000 people are killed every day on the road; at least 30,000 others are injured or disabled, so over 1.2 million people are killed and as many as 50 million injured each year. Cancers of the mouth, tongue, oropharynx, nasopharynx, and larynx comprise approximately 5% of all cancers. These defects are of the topic of interest leading to a substantial amount of physical, functional and cosmetic disfigurement.

Prosthetic rehabilitation is a treatment of choice where surgical reconstruction is not feasible, in cases involving larger defects with substantial anatomical loss.

### MATERIALS USED

Accomplishment for the extensive retention of the prosthesis depends predominantly on the physical and mechanical properties of the material used. Advisable properties of an ideal maxillofacial prosthetic material include longevity, biocompatibility, plasticity, lighter, color matching and permanence, hygiene, ease, etc. Dr. Tsun Ma in a clinical outline of the materials stated that amidst the available materials none out of them is considered absolute.

Establishment of recent materials which give representational aspect to prosthetic restoration have devised a novel feature to rehabilitation of such defects. Amongst the sizable number of materials that have been habitually used, two have been entrenched to be the most definitive, Methyl Methacrylates and Silicones.

In spite of having virtues of color persistence, prolonged serviceable period, acrylic resins yet remain not as widely used when differentiated to silicone, owing to the latter's flexibility and skin-like texture. Nevertheless studies have indicated that chlorinated polyethylene may have a greater reliability over conventional silicone material in its tendency to be corrected, altered or reconditioned, expanding the life of the prosthesis. Additionally it has its advantage of being used with any adhesives, along with its surplus strength and cost effectiveness.

Nonetheless, these materials may encounter certain drawbacks seen over studies investigating discoloration over a stretch, tear on removal of prosthesis or degradation over time. A large amount of damage to the prosthesis occurs when patients remove prosthesis or adhesives, as stated by Khan et al., 1992.

### TYPES OF EXTRAORAL PROSTHESIS

These prosthesis can contain orbital, auricular, nasal or a integration of more than one structure summing to mid facial defects.

The construction of fabricating a prosthesis is indistinguishable for most procedures and includes a total of the following steps:

- Moulage impression and pouring of the working cast.
- Sculpting and arrangement of the pattern, carved in wax on the master cast.
- Designing of a mold.
- Prosthesis processing, including extrinsic and intrinsic coloration.

### Auricular

Rehabilitation of a missing or anomalous ear with the help of auricular prosthesis can furnish definitive outcomes. Amalgamating evolved technology, digital design and precise color formulation have empowered veracious results. The endeavor of utilizing hair to conceal the superior and posterior margin aids in attaining additional superior results. When denoted for a prosthesis, exclusive of the tragus the whole ear should be removed. The tragus assists in camouflaging the anterior margin of the prosthesis and delivers a landmark for periodic placement.

Replacement of the entire ear is favorable as it supplies complete autonomy of form, size and placement. Skin destitute of hair aids in enhanced adhesion whilst chemical anchorage is being delivered. Mirror imaging prosthesis, using the anatomical ear present on the other side can be used as an precise guide for the fabrication of the prosthesis. The employment of adhesives can be questionable, surgical retentive approaches should always be accounted the foremost adjunct. When employing craniofacial implants, placement in the mastoid temporal bone feed superior retention and long lasting results.

### Nasal

The position of the nose is centrally located on the face and very eye-catching, necessitating prosthesis to be greatly pleasing. Endeavor should be made to camouflage the margin with the encircling anatomy and match the color and skin like texture. When fabricating the prosthesis, a one-piece extend intranasal impression is made, which are molded and eventually joint together. Pre surgical photographs can assist for precise replication. Moreover, conservation of nasal bone to deliver retention and support is of vital purport. When placing implants, the preferred site is the anterior floor of the nose and maxilla region.

### Orbital

The prosthodontist plays a leading position in the rehabilitation of patients who have undergone ocular loss. It is downright an easier method as it substitutes only the orbital contents, keeping the eyelids in place. The types of ocular prosthesis have been summarized in Table 1.

Positioning of implants, when implied, particularly for ample defects, is usually settled in the supraorbital rim. Preserving eyebrow position and minimum margin tissue distortion are implied to amount to a precise fit. It is

consistently implied for the patient to wear spectacles to maintain the prosthesis and to shelter mechanical

retention to the prosthesis. Old photographs should be used to assist in attainment of an esthetic result.

**Table 1: Types of Ocular Prosthesis.**

<b>Based on thickness</b>	
Prosthetic eye Having a length greater than 1.5mm approximately	Prosthetic Shell Having a length less than 1.5mm approximately
<b>Based on fabrication</b>	
Ready made	Custom made
It is inexpensive and time limitation exists. Inaccurate fit due to speedy procedure and improper shade matching may be observed.	Precise fit and colour matching is noted. Enhanced adaptation with movement. Can be time consuming

### Retention of the Prosthesis

Retentive methods for maxillofacial prosthesis is a paramount factor for the comprehensive successful outcome of the prosthesis. The retentive methods include adhesives, undercuts and mechanical retention devices. There are a total of 4 methods of anchoring the prosthesis, which are elaborated in Table 2.

Conventionally retained prosthesis are repeatedly noted to have a lesser patient satisfaction due to poor long time

retainment of the prosthesis. They reveal difficulties associated with placement of the prosthesis or dislodgment over a period of time, owing to external movement of loss of bond due to perspiration. Moreover, adhesives can cause skin irritation, or misplacement of its adhesive strength. Regrettably, no superior combination of prosthetic materials has been investigated in recent decades, leading to a greater inclination towards Implant-retained Prosthesis.

**Table 2: Methods of anchoring the prosthesis.**

Anatomical Anchorage	Anchorage provided to already existing structures; Undercuts.
Mechanical Anchorage	Provided through the help of external retention methods like spectacle frames, hair bands, magnets, etc.
Chemical Anchorage	Anchorage with the help of adhesives. May have advantage of irritation and compromised bond due to external movement or perspiration. Adhesives are the more commonly used materials for retention but the weight of larger prostheses may reduce their intake.
Surgical Anchorage	Most secured type of anchorage, with a greater patient satisfaction in which implants are most commonly used.

### Implant Retained Prosthesis

Implant retained maxillofacial prosthesis have become an eminent treatment option and are usually favored over conventional prosthesis by patients. The technique to insert implants is relatively straightforward and is related to a minor level of complications, both peri-operative or long term. Through the principle of osseointegration, these implants have altered the fate of dentistry. Implant retained prosthesis are simpler to place and maintain, with an elevated patient acceptance.

Numerous retention systems for implant suprastructure are currently available, including bar-clip retention, ball attachment, slant lock systems, using abutments or magnetic retention. Most frequently used retention system are the magnetic and bar-clip systems. Studies carried out in-vitro assert that the bar clip system offers the highest retention and should be the method of choice for retaining extra-oral prosthesis. Magnetic systems are more suitable when there is lack of space, as adequate space is required to accommodate the bar-clip system.

These prosthesis may have certain drawbacks. When placed in irradiated bone, the probability of implant

failure is higher compared to placement in non-irradiated bone. Hindering the function of the skin, they may become prone to microbial infections.

### Designing of the Prosthesis Using 3D Imaging Techniques

Latest technologies proffer systematic quality, superior exactness of fit and paramount incorporation, amalgamated with ample robustness and distribution for suitable design. Latest 3D Imaging procedures permit the obtainment of radiologic data with extremely unfavorable amount of radiation and superior image precision. Treatment with the aid of 3D imaging technique is quick, least invasive, apparent and cost effective according to Angelopoulos et.al. 2011 as cited by Serio F.G. 2011. The innovation of CAD / CAM methodology has definitively revolutionized the area of maxillofacial prosthodontics. Competent of mollifying most of the drawbacks of conventional methods, a naturalistic prosthesis can be fabricated, alleviating patient distress.

## CONCLUSION

The branch of Maxillofacial Prosthesis is welcoming the intensive escalation of technology. The use of surgical retentive options have thickened the treatment opportunities. The consequence and patient satisfaction are prime elements dominating treatment considerations. Nourishment quality of life is equivalent as survival rates, and that is why rehabilitation through maxillofacial prosthesis is of overriding significance. Conveyance and patient instruction is the dominant factor for the longevity of the prosthesis. Successful treatment is contingent on the patient's psychological taking. Patients need to be informed about the treatment alternatives and need to be persuaded of their accountability towards the utilization and quotidian supervision of the prosthesis.

The incalculable character of defects have made the job of a prosthodontist more taxing. Whilst there are noticeable approaches in scientific methods and materials in past several years, the satisfied prospective and employment of the services provided by a maxillofacial prosthodontist is yet to be probed. The coherent endeavours, mounting supplemental advanced treatment possibilities will aid in providing smiles and aspiration for patients with oro-facial defects.

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