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Research Article

MANDIBULECTOMY: DEVIATION AS ITS SEQUEALAE AND PROSTHODONTIC REHABILITATION

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ABSTRACT

The reasons for resection of mandible are multifactorial, which further leads to biomechanical alterations in the functioning of the mandible. This not only is a nuisance for patient but also aggravates with time if not properly addressed. This paper presents an insight in to the alterations caused by mandibulectomy and the rehabilitative aspects of mandibular deviation.

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INTRODUCTION

Mandibulectomy with it bring a plethora of problems, which include, cosmetic, phonetic, inability to swallow, control of saliva, trismus etc. of all these problems mandibular deviation and subsequent derangement of mandibular movements are most important for prosthodontist. The basic objective of rehabilitation of such patients is to stabilize the remaining musculature by bringing the residual mandible in acceptable relationship with maxilla. There are many factors which affect the jaw records in particular, of which the site and extent of surgery, the effect of radiation, presence or absence of teeth and psychological impact are considered to be significant (Curtis, 1975). Proper intervention at the right time is important as the proprioception is still present and records can be made more accurately not only improves the biomechanics. The literature has shown various approaches as preventive and interceptive measures to avoid or minimize deviation (Schneider, 1986).

Mandibular deviation

The deviation of mandible is due to the action of suprahyoid muscles and uncompensated influence of contralateral internal pterygoid (moore, 1976 and robinson, 1964). This problem is further compounded by the absence of muscles on the surgical side as masseter on the non-defect side serves to rotate the

mandible, and is not balanced unilaterally by the medial pterygoid. This muscular imbalance leads to frontal plane rotation, which as the name indicates is rotation of mandible in frontal plane. This rotation is due to the imbalance of muscular forces and discontinuity of mandible, and results in movement of teeth away from the maxillary dentition on the ipsilateral side of the defect after the contact is made on the non defect side. This phenomenon gets severe as the force of closure is increased. These biomechanical alteration further causes slightly lower values for molar clenching and higher values for the incisal clenching. The severity of mandibular deviation is dependent on many variables, such as amount of soft and hard tissue resection, method of closure, type of reconstruction, status of dentition etc. Closure of the base of tongue causes most severe deviation, while patients rehabilitated with myocutaneous or free flap have fair prognosis. Due to absence of proprioception and vertical stop of occlusion edentulous patients are difficult to achieve proper maxillomandibular relationships (Beumer, 1979)

These patients are compromised with multiple physical and psychological deficiencies in addition recording of jaw relationship is a challenge for maxillofacial prosthodontist. Numerous techniques have been described to prevent and reduce mandibular deviation. These include physiotherapy, cast partials, guiding prosthesis and modified occlusal schemes.

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Surgical template

These templates are helpful in properly aligning the graft segments; in addition they are helpful in contouring of the osseous part of the graft. After the diagnosis and treatment planning are outlined, a mandibular cbct is ordered which helps in obtaining the stent. The stent is secured with maxilla and residual mandibular segments are aligned in to it, and osseous part is resized, contoured and fixed to the proximal stumps.

Cast metal splint

The mandibulectomy results in discontinuity between residual mandibular segment, and these segments should be maintained in continuity. These splints are made of cast metals and its due to their inherent rigidity that both the residual mandibular segments and graft is stable during healing. In addition it prevents the buccal rotation of the mandibular segments.

Physiotherapy

After surgery restriction in mandibular movements might occur due to trismus. To avoid such disability a muscle exercise program as of physiotherapy must be initiated. It can be started 2 weeks post surgically in the form of an exercise. Patient is instructed to grasp the chin and move the mandible away from surgical side.

Intermaxillary fixation

The use of Intermaxillary fixation in mandibulectomy has been a matter of debate, with proponents believing that it will preserve the proprioceptive sense of the patient. On the other hand opponents believe that such patients redevelop sense of proprioception and maintain that this eventually leads to increased morbidity in the form dental problems. If used it is done immediately and kept for 5- 7 weeks.

Guidance therapy

The deviation of mandible toward surgical side occurs due to loss of tissue continuity inherent to surgical resection (Cantor, 1971) There are situations where it's not possible to reconstruct the mandible, in such cases patients The Proprioceptive influence of the maxillary teeth and the residual mandibular segment can be used to attain acceptable maxilla-mandibular relationship.

Various appliances used to guide mandible are:

1. Mandibular based guidance prostheses (or guiding flange prostheses) (GFP)
2. Palatally based guidance prostheses (or palatal ramp prostheses) (Prencipe, 2009)

Palatal ramp prosthesis is based on the principle of inclined plane, and guides the mandibular teeth into occlusion. On the other hand in GFP, the buccal surface and the cusps of maxillary teeth make contact with the flange which generates a pulling force on the mandible guiding the jaw in desired relation. It is a preferred approach in case of greater degree of deviation.

Maxillary inclined plane prosthesis

This appliance provides an occlusal table which slopes occlusally towards the midline on the palatal aspect of non-defect side. The movement is functionally generated and

recorded. When mandible is closed it slopes progressively in supero-lateral direction towards the occlusion (Schneider, 1986 and Desjardin, 1979)

Positioning prosthesis with palatal flange

This type of prosthesis is indicated in patients who are able to use presurgical intercuspation but cannot prevent mandible from deviating in sleep. A palatal flange is extended inferiorly into the lingual vestibule between the lateral border of the tongue and the lingual surface of the mandible. This flange should not impinge on soft tissue even on closing. There must be maximum teeth in healthy condition and have stable intercuspation for proper articulation, also intermaxillary fixation must have been done at the time of surgery (Martin, 1985)

Mandibular lateral guide flange prosthesis

This prosthesis consists of a mandibular cast partial denture with a guide flange attached to it. This flange is extended in to maxillary muco-buccal fold on the non-defect side. This extension functions against the maxillary teeth thereby maintaining residual mandibular segment in position (Robinson, 1964 and Patil, 2011). This framework is designed to be in contact during function, limiting deviation.

A widened maxillary occlusal table

Those patients who are edentulous or are unable to attain acceptable maxilla mandibular relationship, need a wide occlusal table. It can be given in the form of palatal ramp or twin occlusion. Twin occlusion is basically double row of denture teeth against which opposing teeth occluded (Taylor, 2000)

CONCLUSION

Disfigurement and functional disability are the outcome of mandibular deviation. Rehabilitation of proper form and function is a challenge for maxillofacial prosthodontist, but can be done within physiological limits. Guidance therapy in addition to other preventive measures can not only restore the function, but also improve the quality of life of patient.

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