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Management of The Edentulous Mandible Review Article

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ABSTRACT

The physical characteristics of the body of the mandible are altered considerably following the loss of the teeth .from the point of view of the treatment edentulous mandible becomes a different mandible. Following resorption of the alveolar process the vertical depth of the subsequent denture bearing area is considerably more; the resistance of the bone to trauma is further reduced by changes in the structure of the bone associated with the process of ageing. The aging process is also associated with significant changes in the vascularity, the endosteal blood supply from inferior dental vessels begins to disappear and the bone becomes increasingly dependent on the periosteal network of vessels, and so the treatment and management of edentulous mandible is always a challengeable and needs a perfect expert to perform the surgery.

Key words: Management, Edentulous, Mandible.

INTRODUCTION

The fractures of edentulous mandible represent a group of maxillofacial injuries that more commonly affect the geriatric patients. The loss of bone mass and decreased vascularity decreases the strength of mandible and makes it vulnerable to fracture. Several treatment modalities have been successfully used for clinical management of such injuries in patients with advanced age. However, the treatment options for atrophic edentulous mandible fracture have been a matter of controversy. The bone atrophy and advanced age favours the conservative treatment due to higher incidence of complications associated with geriatric edentulous mandible[1]. A case of conservative management of atrophic mandible fracture using Gunning splint with precise vertical dimensions is being presented in various site of the mandible due to the age factor of the patient.as a result whenever a closed reduction is possible the risk of closed reduction is possible the risk of secondary infection is negligible, again the absence of the teeth means that precise reduction, such as would be required to restore the occlusion of the natural teeth, is not necessary as in accuracy is easily compensated by adjustment of dentures[2], for these reasons many fractures in edentulous patient requires no treatment at all, if the fracture is simple with little or no displacement it will heal satisfactorily if the patient refrains from necessary active movements and adjusts to a temporary soft diet.(16) any subsequent discrepancy in the denture occlusion can be corrected in most cases by relining with or without occlusal adjustment.

Methods and procedure

Closed reduction

Historically, atrophic edentulous fractures were treated closed by wiring in the patient's dentures or fabricating Gunning style splints with postoperative mandibulomaxillary fixation (MMF)[5]. Standard treatment with closed reduction often resulted in prolonged periods of MMF which was difficult for these patients[17]. Additionally, the fractures were often poorly aligned. Postoperative malunions and nonunions were very common[3].

ORIF

Indications for ORIF are any displaced atrophic mandible fracture requiring surgical intervention was summarized by marciani and hill(1979)[4] Following the AO principles of anatomic reduction of fractures and immediate function, ORIF of atrophic edentulous mandible fractures with load-bearing osteosynthesis has a distinct advantage for these patients)[4].The technique has evolved to provide the patient with an excellent chance for mandibular union while the ability to masticate is preserved[6]. Literature has supported the efficacy of this technique.

External fixation

Indications of external fixator might be the temporary stabilization of a fracture while the patient is treated medically, or if soft-tissue maturation around the fracture site is required Complications, including mansion and non-union are significant when external fixators are used as they do stability at the fracture site[5].

Extra oral approach

When treating atrophic edentulous mandible fractures, the surgeon will generally find it easier to use an extra oral surgical approach[6]. The fracture fragments can be manipulated under direct visualization and stabilized while the reconstruction plate is being bent and applied to the mandible.

Intraoral approach

An intraoral approach is possible but technically more difficult as the surgeon will need several sets of trained hands just to retract the soft tissues of the cheeks and tongue. Additionally, stabilization and fixation of the fractures is much more difficult via an intraoral approach[7]. One should also be aware that the inferior alveolar nerve is located on the superior surface of the atrophic mandible. Therefore one must be extremely careful making intraoral incisions to expose atrophic fractures, or the nerve can be damaged[15].

General considerations

Load-bearing osteosynthesis is indicated in treatment of the atrophic edentulous mandible fracture. We currently recommend the locking reconstruction plate 2.4. The plate must be of sufficient length to place screws in adequate bone which is generally found in the syphilis and angle regions. The body region of the mandible is a common area of fracture and generally has bone of poorer quality unsuitable for screw placement[8]. When dealing with bilateral fractures, the plate must span from angle to angle, covering the entire lateral surface of the mandible. At least three screws on either side of the fracture are recommended. Often more screws are necessary due to the poor quality of the bone. The locking reconstruction plate is generally left in place and not removed unless clinical symptoms require hardware removal[10].

Pearl: reduction and temporary fixation

It can be very helpful to reduce and stabilize the fracture with adaptation plates to allow appropriate bending of the template and reconstruction plate. This is particularly applicable in fractures that are widely displaced, mobile, or unstable. The adaptation plates are placed on the inferior border to allow excellent reconstruction plate adaption to the lateral surface of the mandible[11]. After the locking reconstruction plate has all planned screw holes used, the adaptation plate.

DISCUSSION

Body plates are approximately used for displaced fractures of the mandible, particularly those at the angle, they allow the fracture to be stabilized without immobilization of the jaw as a whole the reduced depth of bone in the edentulous mandible favours use of non compression mini plates rather than the bulkier compression plates in that the former are less likely to interfere with the edge of t fracture denture both compression and non compression system s require an adequate blood supply to achieve uncomplicated bony union(Rhinelander,1974)

It is suggested that in these circumstances plates should be applied with an intervening layers of attached periosteal (Bradley, 1975)[12] but in practice this is difficult to accomplish.

Transosseous wiring

Many simple edentulous fracture scan be satisfactorily immobilized by direct Trans osseous wires but in general , when a surgical exposure has been made it is just as easy to apply a mini plate

if available they are easier to apply when placed near upper border they may likely to impinge on denture flanges at the later date[13], the special instrumentation required from the application of miniaturized plates is not universally available in all parts of the world where fracture require treatment and wiring techniques continue to provide a simple and reliable alternative[10].

Circumferential wiring

Circumferential wiring or straps oblique fractures of the edentulous mandible can be most effectively and simply immolized by circumferential wires, Williams (1985)[6] has described the use of miniaturized circumferential nylon straps as a useful alternative to wire.

Trans fixation with krischchner wires

The transfixing wires is passed first into the proximal or distal segment and drilled down the centre of the mandible to emerge through the cortex and skin[(14),] the wire end attached to the drill will eventually come to lie opposite the fracture at which point the inserting drill is detached and the direction of the wire reversed so that it is made to pass back down the other fragment transfixing the fracture (mc dwell *et al,*1954,vero1968)[9] the dental splint described originally by gunning in1866

Intermaxillary Fixation Using Gunning Type Splints

Gunning in 1866 was a vulcanite overlay of the natural teeth which he used as a splint for the fractured dentate mandible.[(18)] these splints take the form of modified dentures with bite blocks in placed on molar teeth and space in the incisors area to facilitate feeding, they can be used when the patient is completely edentulous immobilization is carried out by attaching he upper splint to maxilla by per alveolar wires and the lower splint to the mandibular body by circumferential wiring. Properly constructed gunning type splints should hold the jaws in a slight over closed relationship. The only dis advantage is that it will be difficult to take an adequate impression when the mandible is badly fractured and the alveolar ridge distorted by displacement of the fragments, the lower splint is attached to the reduced fracture mandible by means of circumferential wiring, after the splints have been attached to each jaw they are connected by elastic bands or wire loops utilizing the hooks on the buccal surfaces of each splint and intermaxillary fixation is established

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