

Evaluation of Wound Dehiscence in Rigid Internal Fixation of Facial Fractures

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Abstract

Background: Mandibular fractures or fractures of the jaw are typically the result of trauma, rarely they may be due to osteonecrosis or tumors in the bone. Occlusion and masticatory functions are not much influenced by the type of reduction and fixation. A fractured mandible could be reduced externally or internally. Internal fixation can be accomplished by wire, titanium plate, and screw fixation.

Patients and methods: Forty-three patients with mandibular fractures were included in this study, all of them underwent internal rigid fixation with intermaxillary fixation, they are classified into two groups, the first group , intermaxillary fixation is kept for 7-10 days , the second group includes intermaxillary fixation during surgery only. Edentulous patients were excluded from this study. All patients were placed with lower and upper arch bars or upper and lower eyelid wires, prior to open reduction and internal rigid fixation of the mandibular fractures. We compared postoperatively the outcome in dentate patients with internal rigid fixation, intermaxillary fixation for 7-10 days, and immediate removal of intermaxillary fixation after surgery.

Results: All patients were followed up for wound dehiscence in two groups, group A with intermaxillary fixation for 7-10 days and group B were intermaxillary fixation removed immediately after surgery. Group A did not suffer from the wound dehiscence as in group B.

Conclusion: Wound dehiscence after internal rigid fixation depend on many factors among them restricted active movement, soft diet and good oral hygiene.

Keywords: Wound Dehiscence, Rigid Internal Fixation of Facial Fractures etc.

Introduction

Mandibular fracture, also known as fracture of the jaw , is a break through the mandibular bone. Mandibular fractures are typically the result of trauma, rarely they may be due to osteonecrosis or tumors in the bone, immediate surgery is no necessarily required.⁽¹⁾

Repair may be delayed 5-7 days, surgical correction is recommended as soon as possible. Current concept include early intervention with wide surgical exposure to allow for precise alignment and rigid fixation.⁽²⁾

The principles of treatment for mandibular fractures have changed recently although the objective of reestablishing the occlusion and masticatory function remains the same. ⁽³⁾

Goal of treatment include anatomical reduction of fracture segment, restoration of premorbid occlusion, and avoidance of complications. Options to consider include closed or open reduction. Closed reduction maintains the segments by maxillomandibular fixation. Open reduction allows for direct evaluation of mandibular segments and further for internal or external fixation.

Internal fixation can be accomplished by wire, titanium plate, and screw fixation.⁽⁴⁾

If an ideal anatomical reduction and stable occlusion are achieved intraoperatively, the arch bars and interdental ligatures wires may be removed at the end of the surgical procedure.⁽⁵⁾

The introduction of rigid internal fixation has revolutionized the treatment of maxillofacial fractures, eliminating the need for prolonged maxillomandibular fixation and returning early function. ⁽⁶⁾

Patients and Methods

Forty three patients complaining of mandibular fractures at different sites of the mandible due to different causes range between RTA, altercation and war injuries. Some patients presented with unilateral fractures others with bilateral fractures. All patients were placed preoperatively with upper and lower Erich arch bars or upper and lower eyelid wires to shorten the time of surgery, however, intra-operative maxillomandibular fixation lengthens the operative time. This concern encouraged us to place the maxillomandibular fixation preoperatively.

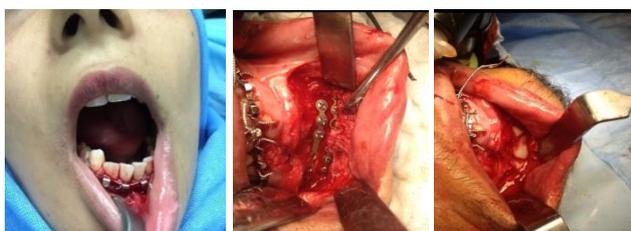
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All patients were given a preoperative local anesthetic "lidocain" with adrenaline at the site of fracture line to reduce the bleeding at the operative site. All surgeries were performed under general anesthesia. The patients were classified into two groups

Group A: Twenty five patients complaining mandibular fractures at different sites were treated with titanium bone plates and screws or with reconstruction titanium bone plates and screws. After adjustment to proper occlusion using the upper and lower arch bars, intraoral approach was followed in twenty one patients and extraoral approach in four patients to explore the fracture site and reduces it to proper location using reduction forceps followed by fixation by bone plates and screws, then suturing was done with two layers with absorbable sutures for muscles and nonabsorbable "silk" for the mucosa. Placement of elastic bands for adjustment of minor occlusion disturbance then change to tie wire for 7-10 days.

Group B: Eighteen patients with the same procedure (exploring the fracture site , reducing the fracture line and fixation with titanium bone plate and screw) fifteen patients were approached intraorally and three patients were approached extraorally , the tie wires and arch bars were removed immediately after surgery with instructing the patient to decrease the jaw movements and to avoid eating hard food, in addition to good oral hygiene and the use of chlorhexidine gargle mouth wash after each mealtime The two groups were followed up for 10 days to compare the wound healing and complications.



Results

The time consumed for surgical operation was different ,group B taken more time than group A because the time

needed for arch bars removal at the end of the surgical operation.

After 7-10 days of follow up all the patients of Group "A" did not suffer from wound dehiscence without any need for resuturing after removal of the stitches and they were in exact occlusion but they couldn't deal with good oral hygiene due to restricted movements of the jaw by intermaxillary fixation. They are prepared for another operation which is removal of the arch bars and tie wires under local anesthesia.

Table 1 Wound dehiscence after 7-10 days

Patients No.Group A (IMF)	Wound dehiscence
25	Zero
Patients No.Group B without (IMF)	
18	6

Table 2 Patients treated with titanium plates and screws and IMF group A

Type of approach	Patients Number	Plates number	Wound dehiscence	Other complication
Intraorally	Twenty one	1 – 3	Zero	No major complications
Extraorally	Four	1 - 3	Zero	No major complications

Table 3 Patients treated with titanium bone plates and screws without IMF group B

Type of approach	Patients number	Plates number	Wound dehiscence	Other complications
Intraorally	Fifteen	1 - 3	Five	Exposed of bone plate
Extraorally	Three	1 - 3	1	Exposed bone plate

Group B after 7-10 days follow up 6 patients suffered from wound dehiscence and they need for resuturing after stitches removal. They were not susceptible to other operation to remove the arch bars because they were removed at the first operation.

Discussion

The efficacy of treating mandibular fractures with titanium bone plates and monocortical screws is well established .The surgical approach applied in 43 patients was intraoral (trans oral) approach in 38 patients and extraoral approach in five patients, this depends on the association of skin where the external approach be obligatory otherwise the rest of patients were treated by intraoral approach to decrease the scar formations and consequent better cosmetic result .

We used 1-3 small titanium bone plates and screws or single reconstruction titanium bone plate depends on the type of the bone fracture. Arch bars or inter-dental wiring were kept for 7-10 days in one group but , immediate removal after surgery in the other group.

This study shows the risk of wound dehiscence in 43 patient after treating the mandibular fracture with titanium bone plates and screws ,dividing patients into two groups, group A where treated with titanium bone plates and screws with intermaxillaryfixtion for 7-10 days ,and group B where treated with titanium bone plate and screws with intermaxillary fixation removal immediately after the completion of the surgery.

Intraoral and extraoral approach useing titanium bone plates is very important in reducing post-operative complications and promoting the healing process. (7)

Ayman Chritah,et al noted two minor complications of intraoral dehiscence and malocclusion were noted in study in 34 patients treated with 2.0 mm L.M.Ps . (8)

Anil Kumar Danda noted that wound dehiscence was found in five patients in study on 54 patients using 2 noncompression titanium plate. (9)

R.Bryan and David M.Wilson noted that wound dehiscence was found in one patient in a study in 75 patients treated with titanium bone plate and intermaxillary fixation. (10)

Albert J.Fox, et al noted wound dehiscence with exposure of an underlying plate,occurred in 4 patients in studyon 88 patients were treated with titanium bone plates and screws without intermaxillary fixation. (11)

Guimond C, e.g. all noted one patient developed a mucosal wound dehiscence without consequence in a study on 37 patients treated with bone plates and intermaxillary fixation for a mean period of 22 days A nonchewing diet was prescribed for 6 weeks. (12)

Our study was done on 43 patient with different mandibular fractures site , regarding the approach type there were no complications of wound dehiscence in group treated with titanium bone plates and screws with intermaxillary fixation , but 5 patients were complicated by wound dehiscence in group treated with titanium bone plates and screws without intermaxillary fixation , these cases were treated with good irrigation and antibiotics with wound resuturing.

Conclusion

There are many reasons for wound dehiscence after internal rigid fixation, some of them are related to the patients themselves.

Following the proper instructions of movement restriction, soft diet and perfect oral hygiene participated in prevention of wound dehiscence. Wound dehiscence seen in this study are due to failure of obeying these instructions.

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