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A Comparative Evaluation between Fixation Techniques Using Lag Screws and Mini Plates in the Treatment of Parasymphysis Fracture.

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Abstract

Background: Aim: The objective of this study was to compare the results of lag screws and mini plates in treatment of parasymphysis fracture. **Subjects and Methods:** Forty patients of age group 20-45 yr old with clinical and radiological evidence of the traumatic injury to the parasymphysis were included in this study and were randomly divided in two groups. In group A—two 2.5 mm lag screws were placed in 20 patients and in group B—two 2.5 mm mini plates were placed in 20 patients. The statistical analysis was done by using SPSS 15. **Results:** The majority of patients in Group A, the time needed to complete the procedure ranges from 60 to 90 min (65%), while for the time range from 60 to 90 (55%) and 90 to 120 min (35%) in Group B. The difference in time required for completion of the procedures between the two groups was found to be statistically significant. In Group A, the duration of post-operative swelling varies as it is minimum for 5 days in 13 patients (65%) and maximum 15 days in 3 patients (15%). In Group B, swelling was present for minimum 5 days in 14 patients (70%) and maximum 15 days in 2 patients (10%) **Conclusion:** Although the sample size is less to reach to any conclusion, the results of our study suggest that the use of lag screws in the fixation of mandibular fractures can be a very demanding procedures as lag screw technique for Parasymphysis fracture provide several advantages over Mini plates.

Keywords: Parasymphysis fracture, Lag screw, Miniplates.

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Introduction

Mandibular fracture occurs more frequently than any other fracture of facial skeleton. The mandibular fractures mainly occur due to assaults, road traffic accidents (RTA), falls and sports injuries.[1] Although there is a wide variance in the reported percentage of fractures of the anterior mandible, aggregate analysis places this at approximately 17% of all mandibular fractures.[2] The goal of treatment of mandible fractures should be to return the patient to a preinjury state of function and aesthetics, restore proper function by ensuring union of the fractured segments and re-establishing preinjury strength; to restore any contour defect that might arise as a result of the injury; and to prevent infection at the fracture site.[3]

A variety of different treatment modalities have been described for surgical reduction and fixation of a mandibular fracture. Among them are closed or open reduction, extra oral open reduction and internal fixation with a reconstruction plate, intraoral open reduction and internal fixation using different mini-dynamic compression or noncompression plates and an intraoral approach with lag-screw fixation.[4] Miniplate osteosynthesis was introduced to maxillofacial surgery by Michelet et al. in 1973.[5] The lag screw technique in maxillofacial surgery was first advocated by Brons and Boering in 1970 and was later reintroduced by Niederdellmann et al.[6]

The aim of the present study was to compare the results of lag screws and mini plates in treatment of parasymphysis fracture.

Subjects and Methods

Forty patients of age group 20-45 yr old with clinical and radiological evidence of the traumatic injury to the parasymphysis reporting to the OPD of Department of Oral and Maxillofacial Surgery were included in this study and were randomly divided in two groups. The study was approved by Ethical Committee. In group A—two 2.5 mm lag screws were placed in 20 patients and in group B—two 2.5 mm mini plates were placed in 20 patients. The patients with fracture of parasymphysis region of mandible with no evidence of pus discharge, patients who were medically fit for surgery under general anesthesia or local anesthesia and who were willing for surgery, patients within the age group of 20-45 years were included in the study. Patient with Comminuted mandibular fractures, pathologic fractures, hematological disorders and any other associated midface fracture were excluded from this study. The statistical analysis was done by using SPSS 15.

Results

40 patient with traumatic injury to the parasymphysis requiring open reduction and internal fixation were included in this study. In group A—two 2.5 mm lag screws were placed in 20 patients and in group B—two 2.5 mm mini plates were placed in 20 patients. In our study, male patient was predominant. Out of 40 patients 70% were male and 30% female.

The majority of patients in Group A, the time needed to complete the procedure ranges from 60 to 90 min (65%), while for the time range from 60 to 90 (55%) and 90 to 120 min (35%) in Group B. The difference in time required for completion of the procedures between the two groups was found to be statistically significant [Table 1].

In Group A, the duration of post-operative swelling varies as it is minimum for 5 days in 13 patients (65%) and maximum 15 days in 3 patients (15%). In Group B, swelling was present for minimum 5 days in 14 patients (70%) and maximum 15 days in 2 patients (10%) [Table 2].

Table 1: Comparison of time required for procedures.

Time required for completion of procedure (min)	Group A n=20 (%)	Group B n=20(%)	P value
<30 and<60	4(20)	1(5)	0.043*
>60 and<90	13(65)	11 (55)	
>90 and<120	1 (5)	7 (35)	
>120 and<150	2 (10)	1 (5)	

Table 2: Comparison of the duration of post-operative swelling.

Presence of post-operative swelling	Group A (n=20)	Group B (n=12)	P value
Till 24 h	20 (100)	20(100)	0.461
Till 3 days	20(100)	15(75)	
Till 5 days	13(65)	14(70)	
Till 7 days	7(35)	8(40)	
Till 10 days	5(25)	6(30)	
Till 15 days	3(15)	2(10)	
Till 1 month	0(0)	0(0)	

Discussion

The present study was done to compare the results of lag screws and mini plates in treatment of parasymphysis fracture. In our study, the incidence of parasymphysis fracture was more in males. The present study included patients within the age group of 20–45years. The goal of each of the operative treatment of mandibular fracture is to be functionally stable osteosynthesis which permits.

- Firm binding of fracture fragments.
- Quick healing without complications.
- Acceptable function and esthetics.[7-11]

The majority of patients in Group A, the time needed to complete the procedure ranges from 60 to 90 min (65%), while for the time range from 60 to 90 (55%) and 90 to 120 min (35%) in Group B. The difference in time required for completion of the procedures between the two groups was found to be statistically significant. In Group A, the duration of post-operative swelling varies as it is minimum for 5 days in 13 patients (65%) and maximum 15 days in 3 patients (15%). In Group B, swelling was present for minimum 5 days in 14 patients (70%) and maximum 15 days in 2 patients (10%).

Goyal M et al conducted a study to compare the efficacy and surgical outcome of treatment of anterior mandibular fracture using either 2.0 mm titanium miniplate or 2.4 mm titanium lag screw technique. Results of the study showed that the mean duration of surgery (hours) was 1.97 ± 0.52 for group I and 1.26 ± 0.55 for group II. The difference was found to be statistically significant (p value 0.001). i.e. more time was taken in case of surgery with mini-plates when compared to the lag screw.[12] Another study conducted by Bhatnagar A et al to compare the outcome of open treatment of mandibular fracture (symphysis or parasymphysis) using lag screw or mini plate clinically as well as radiologically in young and healthy individuals of poor socioeconomic status. Results during follow up period shows a significant improvement in bite force was present in both the groups, withmmore improvement seen in the lag screw group (p\0.01). There was a significant pain reduction present in the lag screw group (p\0.01) and also masticatory efficiency showed a steadier improvement in lag screw group.[13]

Conclusion

Although the sample size is less to reach to any conclusion, the results of our study suggest that the use of lag screws in the fixation of parasymphysis fractures can be a very demanding procedure as lag screw technique for parasymphysis fracture provide several advantages over Mini plates.

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