



THE INCIDENCE OF PLATE REMOVAL IN MAXILLOFACIAL TRAUMA PATIENTS: A RETROSPECTIVE STUDY

Dental Science

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ABSTRACT

INTRODUCTION: There are no evidence base data recommended that every plate should be remove just after bone healing but the study reported that with many reasons the plate removal cannot be avoid and its removal range varies from 7% to 33.8%^{8,9,10}

PURPOSE: The purpose of this study was to observe the plate removal incidence at our centre and to find out that if this is within an acceptable range?

METHODS: We observed the operation theatre record and recorded the incidence of plate fixation and plate removal within 1 year period.

RESULTS: We found that 261 trauma patients operated by open reduction and fixation by using miniplates. In which only 5 patients were female. In the same way we also observed that 56 (21.4 %) male and 3 (1.14 %) female and total 59 (22.6 %) patients and 86 sites operated for plate removal in the same time period.

CONCLUSION: Although removal rate at our centre is within acceptable range, even then we recommend adherent to strict infection control program to further minimize this data.

KEYWORDS

INTRODUCTION:

Maxillofacial trauma has been managed by Maxillomandibular fixation time immemorial and still is an important pillar of maxillofacial bony injury management, but in 1978 Champy et al¹ introduced a surgical technique in which mini-plates were used in the maxillofacial region, and these plates becomes very popularised in the management of facial trauma and even in orthognathic surgery. There are a little but heterogenous data in existing literature concerning the removal of these plates or any other fixation devices, so the risk and benefit of plate removal still remains a controversial topic. Mini-plates are composed of material having biocompatibility and better physical properties. However, various studies reported the side effect of these internal fixtures like metal toxicity and allergy, migration, palpability, and thermal sensitivity, associated with the application of these mini-plates, and the standard protocol for plate removal is still controversial. Some researchers recommend removal in general^{2,3,4} while others do not recommend removal unless clinical symptoms occur^{5,6,7}. However there are no evidence base data that recommends that every plate should be remove just after bone healing but the study reported that with many reasons the plate removal cannot be avoided and its removal range varies from 7% to 33.8%^{8,9,10}

With this backdrop, the present retrospective study was planned to observe the incidence of plate removal.

AIM AND OBJECTIVES:

The purpose of this study was to observe the plate removal incidence at our centre and to find out that if this is within an acceptable range?

MATERIAL AND METHOD:

We observed the operation theatre records and collected the information of patients, who underwent open reduction and mini plate fixation and the data of plate removal surgery in the Department of Oral and Maxillofacial Surgery of the King George's medical University for one year. We also noted the fracture sites from where the plates were removed.

RESULTS:

In our department, trauma patients were operated 5 days in a week by open reduction and fixation with the use of plates. We observed OT records and found that 261 trauma patients operated by open reduction and fixation by using plates annually. We also observed that 56 (21.4%) male and 3 (1.14%) female and total 59 (22.6 %) patients and 86 sites were operated for plate removal in the same time period. Site of plate removal in trauma patients were also observed. We observed maximum plate removal done from Para symphysis site and minimum from Symphysis region. (table-1)

Site of plate removal	No. Of patients	
	Left side	Right side
Lefort I	2	2
Lefort II	7	4
Fronto zygomatic	4	7
Buttress region	4	7
Parasymphysis	13	8
Symphysis	20	2
Body	8	5
Angle	3	6
Condyle	2	2

We also observed the age distribution and found that maximum plate removals were done in 20 to 40-year age group patients. The small number of incidence rate precluded statistical analysis. (table 2)

Age	No. Of patients
1-10 year	2
10-20 year	3
20-30 year	29
30-40 year	13
40-50 year	9
50-60 year	2
60-70 year	1

DISCUSSION:

During the last 3 decades use of plates and screws has become routine in the management of maxillofacial fractures worldwide. Although management of maxillofacial fracture with plates and screws is popular choice, but associated with some complications¹¹ (local infections, pain, dehiscence, etc). The controversy regarding retention of symptom free mini-plates used for maxillofacial surgery still persist. Many centers^{2,3,4} have advocated the routine removal of plates with their argument that the mini-plate could possibly act as a foreign object with the potential to cause complications, and that mini-plates generate growth restrictions among paediatric patients whereas in other centers,^{5,6,7} they are routinely left in place and oppose the removal of mini-plate with the explanation of its biocompatibility, low incidence of complications and the risks of general anaesthesia during removal, possible damage to adjacent anatomical structures, and the expense of removal. Evidence has not yet supported a general consensus for the removal of mini-plates. In our centre we do not favour the routine removal of asymptomatic plates but we remove the plate only in case of infections, plate exposure, and any other reason of discomfort or on patients demand.

Many authors have reported wide range of mini-plates removal, extended from 7% to 33.8%^{8,9,10}. The present study also reported a specific removal rate of 22.6 %, which lies within the reported range and closer to the minimum incidence range of plate removal.

This study indicated several causes for plate removal, such as infection, plate loosening, pain, and patient request (without clinical symptoms). We found that 2 paediatric patients were operated with non-absorbable plate so advised for plate removal due to avoid growth inhibition. Previous study reported that resorbable plates may be option for the management of paediatrics fractures. But unfortunately, resorbable plates also have its limitation such as these plates are comparatively bulky, and takes longer period of time to resorb. Therefore, these resorbable plates may cause some inhibition of facial growth when placed over the growth centres. As the resorbable screws are larger in size and have larger grooves making it difficult and sometime impossible to use over thin bone. Lastly, resorbable plates require additional time for the placement due to the technique required to place these plates.¹² So the use of resorbable plate in paediatrics patients is not completely justified.

We observed that infections with loosening of plate were the major case of plate removal and one patient requested for removal because he has feeling of warmth at fronto-zygomatic plate whenever he works in his farm in summer. In our study, maximum patients were 20-40 years age group, who are most active group for outdoor activity. We observed 1.1 % female patients for plate removal and the incidence of male patients (21.4 %) were higher mainly due to higher outdoor activity. In reference to age distribution, most of the previous study also reported the higher incidence rate in either 20 to 30-year age group¹³ or 30 to 40-year age group patients.¹⁴

Although some previous study shows more incidence of mandibular plate removal¹⁵. We also observed that the incidence of plate removal was more at para symphysis region and the main reason may be due to intake of liquid diet through lip causes infection in this site particularly if the quality of suturing is not good. The number of plate removal for Le-Fort fractures site was close to Para symphysis site, the reason may be due to the quality of maxillary bone is highly thin near the maxillary sinus, which leads to the loosening of screws, bone resorption and the proliferation of inflammatory granulation tissue, increasing the possibility of infection⁸. Although the incidence of maxillofacial plate removal is not high in our study and also corroborate the previous studies but we have to think that even this incidence can be minimised. Probably the infections causing plate removal may be minimise by putting more stress on quality control and maintenance of sterilisation and use of sensitive antibiotics, reduction of operating time and also improving the closure technique to avoid plate exposures.

CONCLUSION:

Our study shows that although we don't recommend asymptomatic plate removal but we remove plate which is within the acceptable range but many of the reasons of plate removal such as infection, plate exposures etc can be minimised just by some improvements in sterilization control, technique modification, and proper patients counselling.

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