

Incidence Of Surgical Removal Following Maxillofacial Fixation- A Retrospective Study

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ABSTRACT

Introduction:

The treatment for maxillofacial injuries in bone fixation is nowadays advised using miniplates. The surgical fixation through miniplates is recommended with stainless steel miniplates or titanium miniplates. However, the miniplates cause many allergic and other adverse effects which lead to the removal of such fixation material.

Materials and methods :

A retrospective study was conducted in patients undergoing miniplates fixation removal at Saveetha dental college and hospitals. The data was obtained from (Dental Information Archiving Software) DIAS. The collected data was compiled using excel and data analysis was carried out using SPSS software version 21. Chi square test was used for test associations between categorical variables.

Results and discussion :

For this study a total of 27 patients were taken. It was observed that stainless steel mini plates were more commonly removed compared to that of titanium mini plates. A positive correlation was observed in comparison with gender and was found that males (69.23%) were more predominantly involved with surgical removal of mini with a p value = 0.009 ($p < 0.05$). A positive association was found in comparison between the age and percentage of people who underwent surgical removal of fixation material and was observed that between the age group of 20-40 have removed the SS miniplates at higher rate (76.92%) showing a p value of $p = 0.000$ ($p < 0.05$).

Conclusion:

The study thus enabled the people who are more prone to the surgical removal of fixation material and helped to identify that stainless steel miniplates are the most common to cause foreign body reaction and complications thus ultimately leading to removal of such material.

INTRODUCTION

In this fast moving world fractures, injuries, and infections are quite common. The main aim of all therapies are to restore to the normal form and function as before. (1) The fixation in the oral and maxillofacial region with the help of mini plates has been providing a great support in the treatment of fracture and orthognathic surgeries. (2) The introduction fixation of mini plate treatment in orthognathic surgery was given since the 19th century and is widely used nowadays. The mini plates offer good support and better property to restore the original function. (3,4). The usage of mini plates has increased in upcoming years. These mini plates are commonly made using titanium or stainless steel (5). These metals offer better stability and properties compared to other metals and have been highly preferred by the oral surgeons in recent years. However, there have been many reports stating the complications and other defects caused due to these materials after a period of time (6). These complications include, metal toxicity, allergy, stress shielding, metallosis, migration, palpability, and thermal sensitivity, caused by the use of mini-plates, and the appropriate removal of mini-plates remains appropriate. Many surgeons have recommended the removal of such fixation material that has established various clinical symptoms in general (7).

Many studies provide information on the usage and complications of mini plates and the removal was only found to be the only solution (8). Brown in his study discussed the removal of fixation material at symphysis and parasymphysis in the patient by orthognathic surgery and the other treatment planned (9). Dessus has also mentioned the various reasons for the removal of such fixation material. (10)

The lacunae of this study include the sample size which was taken within a limited geographical area. Thus, this study aims to establish the prevalence of people in removal of such fixation material and the type of material commonly removed. In addition the study also provides information on the factors that influenced removal by additionally examining the sex and age of patients. Our team has extensive knowledge and research experience that has translate into high quality publications (11), (12), (13), (14), (15-24) (25), (26-28). (29,30)

MATERIALS AND METHODS:

A retrospective study was conducted among the patient population of Saveetha dental college. The data was obtained from DIAS (Dental information Archiving software) After assessment in the university patient data registry, case records of 27 patients undergoing miniplates removal were included in the study and evaluated. The inclusion criteria for the study were the patients who reported to Saveetha dental college with a complaint in removal of fixation material and already placed fixation material, etc. The patients reported with normal lesion pain without placement of fixation material were excluded from this study. The patients reported with other dental complications were also excluded from this study. Demographic details like age, gender, and clinical symptoms were also recorded. Cross verification of data for errors was done with the help of an external examiner. The collected data was compiled using excel and data analysis was carried out using SPSS software version 21. Chi square test was used for test associations between categorical variables and p value < than 0.05 was considered as significant.

RESULTS:

Figure 1

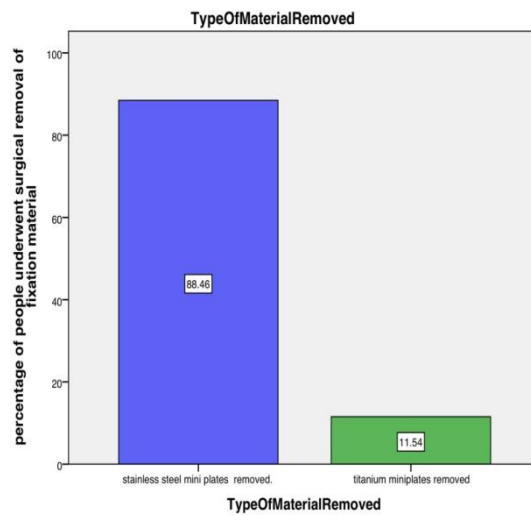


Figure 1 represents the percentage of people who underwent surgical removal of fixation material to that of the type of material removed. Blue colour denotes removal of stainless steel mini plates and green colour denotes the removal of titanium mini plates. 88.46% of people have removed stainless steel mini plates and 11.54% of people have removed titanium mini plates.

Figure 2

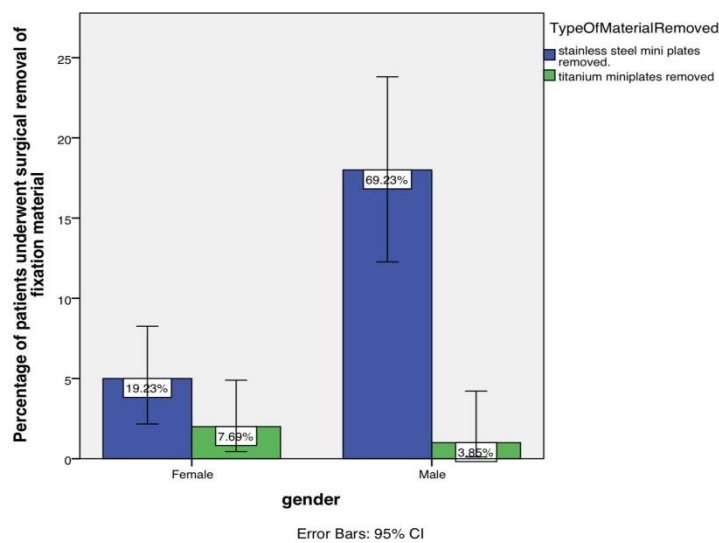


Figure 2 depicts the correlation graph between percentage of people who underwent surgical removal of fixation material and gender of such patients. Blue colour denotes removal of stainless steel mini plates and green colour denotes the removal of titanium mini plates. Among the males, 69.23% have removed stainless steel mini plates and 3.85% patients have removed titanium mini plates . whereas among females, 19.23% of patients have removed stainless steel mini plates and 7.69% of patients have removed titanium mini plates.

Figure 3

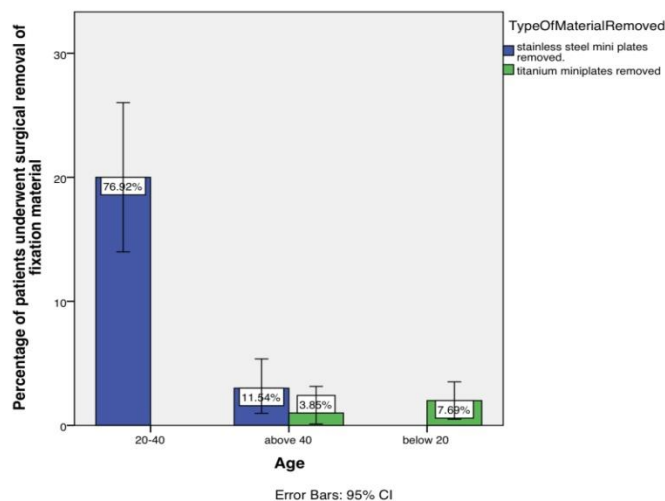


Figure 3 represents the association graph between percentage of people who underwent surgical removal of fixation material and age of such patients. Blue colour denotes removal of stainless steel mini plates and green colour denotes the removal of titanium mini plates. Among the above 40 years, 11.54% have removed stainless steel mini plates and 3.85% patients have removed titanium mini plates . Among the above 40 years, 76.92% of patients have removed stainless steel mini plates. Among below 20 years, 7.69% of patients have removed titanium mini plates.

DISCUSSION:

For this study a total of 27 patients were taken. It was observed that stainless steel mini plates were more commonly removed compared to that of titanium mini plates. (Figure 1). A positive correlation was observed in comparison with gender and was found that males (69.23%) were more predominantly involved with surgical removal of mini plates than the females (19.23%) with a p value =0.009 (p <0.05) (Figure 2) . A positive association was found in comparison between the age and percentage of people who underwent surgical removal of fixation material and was observed that between the age group of 20-40 have removed the SS miniplates at higher rate (76.92%) compared to age below 20 years and above 40 years (11.54%) showing a p value of p = 0.000 (p<0.05) (figure 3).

From the results, we infer that stainless steel miniplates were more commonly removed compared to titanium mini plates (figure 1). Though miniplates offer excellence at fixation, the material used often provides disadvantages and complications. The adverse effects incorporate irritation, allergy, infection, swelling , lesions, pain to the patients after a certain period of time. It was been observed from the study that stainless steel is more causative with these infection comparative to that of titanium placed patients (3)

From figure 2, we observe that males were more prone to removal of such fixation material than females. This depicts the males with more exposure to trauma, infection, and orthognathic surgeries. The removal was most commonly due to the infection that was resulted and this could have occurred due to the poor oral prophylaxis and not following the post operators instructions as mentioned. Moreover the stainless steel material property to cause infection and allergy are at higher rate compared to titanium was given by war thin in his study(4)

The age groups affected and surgical removal of fixation material was compared, wherein the age group between 20-40 yrs were common. This age group of people often get involved with maxillofacial trauma and lack of oral prophylaxis are more observed at this age group(31).

CONCLUSION:

The study thus enabled the people who are more prone to the surgical removal of fixation material and helped to identify that stainless steel miniplates are the most common to cause allergies and complications thus ultimately leading to removal of such material.

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CONFLICT OF INTEREST

Authors declare no potential conflict of interest.

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Ethical Clearance: Not Required

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