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Advantages of Lag Screw in Treatment of Lateral Malleolus Fractures.

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ABSTRACT

Displaced fractures of the lateral malleolus are typically treated with plate osteosynthesis with or without the use of lag screws, and immobilisation in a plaster cast for up to 6 weeks. Fixation through a smaller incision with less metal, such as lag screw only fixation, would theoretically lead to decreased infection rates and less irritation caused by hardware. The purpose of this study was to evaluate the benefits and success of lag screw only fixation of the lateral malleolus in non-comminuted oblique fractures of the lateral malleolus. A total of 25 patients who had non-comminuted unstable oblique fractures of their lateral malleolus that had been surgically fixed with lag screws only were retrospectively evaluated. All patients were younger than 60 years of age. Evaluation of the success of fixation, complications, resultant mobility and patient satisfaction was based on information gathered from chart reviews, X-ray findings and a standardised questionnaire based on the AOFAS Foot and Ankle Outcomes Questionnaire. These results were compared to an age-matched group of 25 consecutive patients treated with plate osteo synthesis. Of the 25 patients fixed with lag screws, nine had an unstable fracture of the lateral malleolus only, ten were bimalleolar fractures and six were trimalleolar. Eighteen patients were treated with two lag screws, and seven were treated with three lag screws. The bi- and trimalleolar fractures were treated with standard partially threaded cancellous screws.None of the lag screw-only group lost reduction. There were no documented wound infections in the lag screw group as compared to three deep infections in the plate group. Lag screw-only patients reported no palpable hardware as compared to 50% of the plate group. AOFAS scores at a mean of 12 months post-operative were similar in both groups. Lag screw only fixation of the lateral malleolus is a safe and effective method that has a number of advantages over plate osteosynthesis, in particular less soft tissue dissection , less prominent, symptomatic and palpablehardware and a reduced requirement for secondary surgical removal.

Keywords: lag screw, malleoulus fractures, osteosynthesis.

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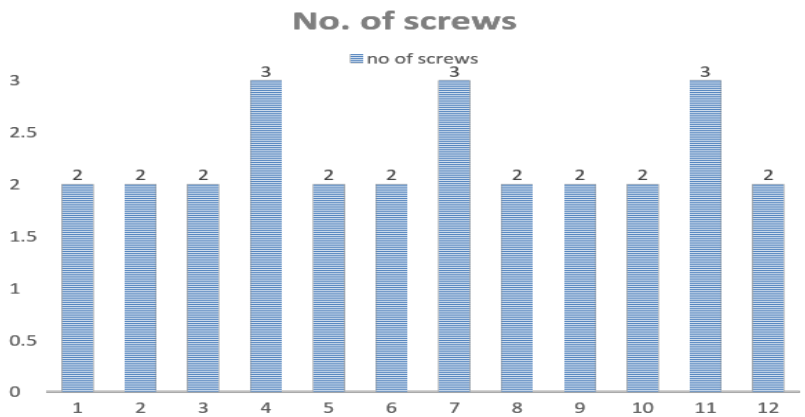
INTRODUCTION

Ankle injuries are found to have a lot of disabilities though historically thought to have an excellent healing. Studies have shown that the physical disability associated with the ankle injuries is increased.17-21% of patients have residual disability.The main management is to establish joint congruency.The lateral talar shift has to be reduced to achieve the ankle mortise. If proper reduction is not achieved then it may lead to post traumatic arthritis. The conventional treatment pattern for these injuries had been plate osteosynthesis with plates with or without lag screws to compress the fragments however this procedure is associated with a lot of soft tissue damage with wound dehiscence. Prominent hardware can also lead to peroneal tendon Injury.Soft tissue damage associated with plating, it affects the long term functional outcome. This shows that the minimal amount of dissection will result superior functional results. Minimal invasion orthopedics have been tried in the lateral malleolus such as intra meduallry nailing, circlage wiring or lag screw fixation. The rationale behind these minimally invasive procedures is to minimize the damage that has already occurred because of the trauma along with lesser dissection, lesser operating time and less amount of foreign materials. The main disadvantage of these lesser invasive methods is the problems associated with late mobilization and the possibility of increased complications. In our study the period of immobilization regardless of the method has been kept at 4-6 weeks. The general idea is that the complications associated with plate osteosynthesis outweighs the benefits associated with rigid internal fixation;the same reason our study involves comparison between plate osteosynthesis and screw fixation.

MATERIALS AND METHOD

Our study is a comparative study between lag screw fixation and plate osteosynthesis done for lateral malleolus fractures in our hospital. Twelve patients treated consecutively with lag screw fixation were compared with age matched controls of twelve patients treated with plate osteosynthesis. The study included all patients with a follow up period of 2 years. All the cases were done by the senior surgeon in our department. The patients selected for lag screw fixation had simple oblique or a spiral type of fracture without any communition. The fracture morphology should also be such that it is big enough to allow the placement of minimum of two screws. The surgeries were carried out by the techniques that were laid down by the AO Group through a small lateral incision. The fractures were reduced and were fixed with two or three partially threaded cancellous screws. Regional osteoporosis is always a contra indication for lag screw fixation and hence we have excluded all the patients above the age of 55 years and only patients with lateral malleoli fractures were taken up for the study We did not involve bi malleolar or tri malleolar fractures. The patients were immobilized for 4-6 weeks. Partial weight bearing was started after 4weeks and then full weight bearing started after 8 weeks. We compared the radiological outcomes and fractures union times along with the wound dehiscence between the patients underwent lag screws and plate osteosynthesis

RESULTS



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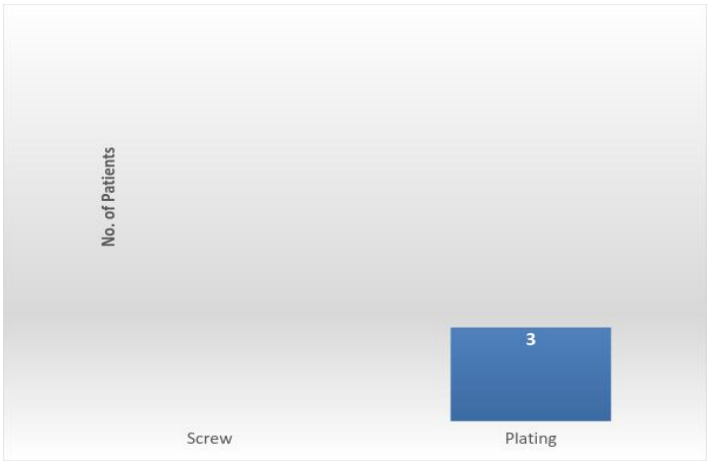

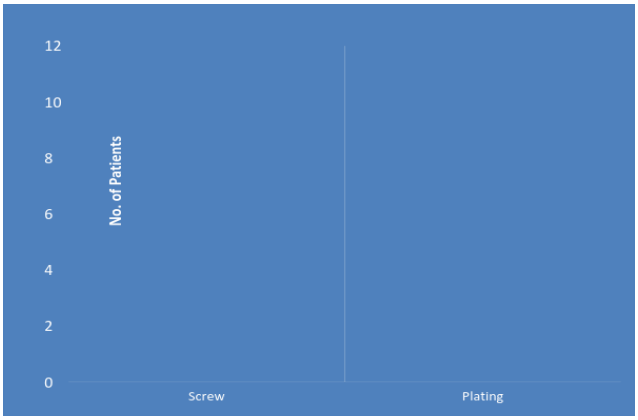

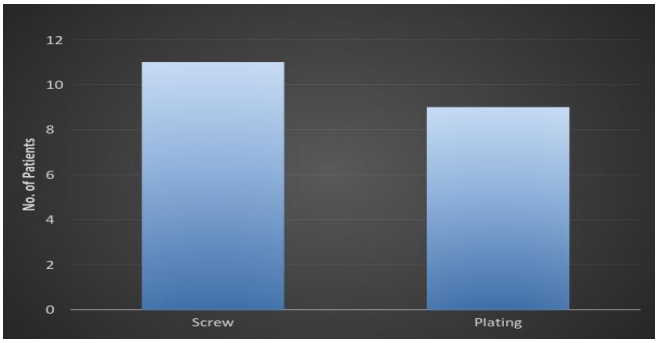

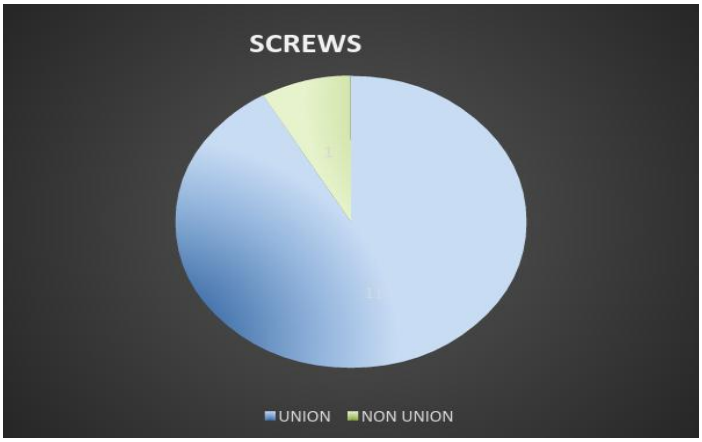

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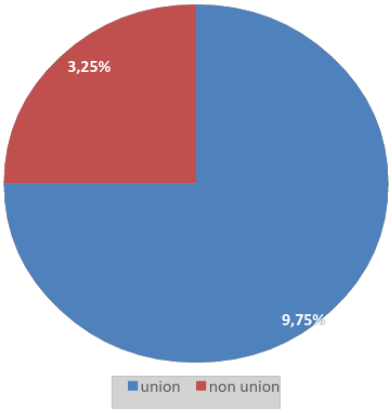

DISCUSSION

The Lag screw fixation is a very good alternative for lateral malleoli fracture.Open reduction also allows proper visualization for surgeon, achieving an anatomical reduction is necessary for a good outcome and helps us to evaluate the fracture pattern.This had better advantages than percutaneous procedures. Our study showed that an less stable fracture fixation as such does not affect the fracture outcome. The main disadvantage is the long period of cast immobilization following the surgery. But no study has proven that a faster mobilization has better prognosis. Studies have however shown that early mobilization instead causes a lot of wound complications and equinus contracture. We use standard AO stainless screws instead of bio absorbable screw because of the costs that could have incurred and the foreign body reactions that they have been associated with a range of 0.8%to 1.1%. Brown postulated that only 50% of patients benefitted from hardware removal. The post-operative scores were less in those patients with lateral pain after removal which was same as that it was before the surgery. This study also had 3 instances of infections out of the 24 patients

that were operated upon. The worrisome fact that these infections occurred only in those undergoing plating has led us to believe that the extensive dissection and hardware to be the cause. The delay in surgical treatment has also been found to affect the treatment outcome of the patients. These patients have more injury to the soft tissues and more frequent wound infections [1-5].

CONCLUSION

- Our study has shown that if the patient has a simple oblique or spiral fracture and the bone is not osteoporotic then lag screw fixation has advantages over plate osteosynthesis .
- The advantages are lesser soft tissue injury, no or minimal palpable hard ware and less requirement for a secondary surgical procedure.

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