Original Article

Is syndesmotic fixation is necessary in ankle injury, where we stand today?

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Syndesmotic injury of ankle is not a very common injury. Treatment of this injury is very challenging and controversies are always there regarding the treatment and fixation methods, the time of weight bearing and removal of screws .Here in this study of 52 cases we have extensively searched the literature and tried all modes of fixation and finally concluded that tricortical fixation with 2 syndesmotic screws through plate works well and does not interfere with the weight bearing.

[*J Indian Med Assoc* 2018; **116:** 47-8]

Key words **: Syndesmosis, ankle, injury treatment.**

Ankle injury is very common in our day today practice. Its range varies from simple stress, strain, ligamentous injuries to different types of fractures. So the treatment also varies from conservative to different type of operative treatment with varied typeof results. Ankle joint is not just a tibiotalar joint but the inferior tibiofibular joint and the syndesmosis between tibia and fibula plays aimportant role. And it undergoes a continuous cycling loading and unloading. For a better functioning of ankle joint anatomical reduction and stable fixation is must. If there is a syndesmotic injury of ankle the syndesmosis has to be addressed, anatomically reduced and has to be fixed. Without reduction of syndesmosis getting a concentric ankle joint space is difficult. Regarding fixation of the syndesmosis the literature has mentioned different type of methods of fixation. And each of them has its own advocate.

The aim of this study was to see the importance of methods of fixation of the syndesmosis, compare and analyze the results and come to a conclusion of best method of syndesmotic fixation.

Material and Methods

The study was conducted in the department of orthopedics at NRS Medical Collegefrom 2014 March to February 2018. The total number of cases were 52, 36 males and 16 females. The age varied from 21yrs to 65 yrs with average age of 36 years. The open fractures and patients having comorbities like diabetes, hypertension, compromised heart and kidney conditions were excluded from the study. The longest follow up was of 4 years and shortest was 9 months, 4 of our patients lost to follow up.

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Surgical Technique :

After getting anesthetic clearance and proper counseling patient were taken for operative intervention. The average time between the date of injury and date of operation was 6 days. In the mean time the patient were treated by elevation, ice compress and immobilization with a below knee splint. All the operation were performed under spinal anesthesia, withtourniquet. The average tourniquet time was 70 minutes. . The sequence of fixation was distal fibula withplate in all cases achieving the correct length followedby addressing the medial malleolus with 4mm multiple cannulated screws or in some cases with TBW. In all of our cases the syndesmosis was fixed with one or two srews but all through the plate. In 34 of our cases we fixed the syndesmosis with 2 tricortical screws, 16 cases with single screw but 4 corticeswhere as the remaining 2 cases were fixed with suture anchor. These 2 cases have shorter follow up of 9 months. The wound were closed in layers. Below knee plaster was applied in all cases for a better wound healing. Tourniquet was released after the plaster. Dressing was changed at 4 days and stitches were removed at 2 weeks. Plaster was continued for 3 weeks. Our patient was allowed non weight bearing crutch walking for 6 week. After that gradual weight bearing was allowed with crutches. At 3 months our patient could walk without crutches.

Review of Literature :

In a cadaveric study Mcbride *et al*[1] concluded that the syndesmotic screw should be given parallel to ankle joint 2 to 3.5 cm above the ankle joint. More proximal screws are mechanically weakerthan distal screw.Thompson *et al*[2] in a study opined that there was no biomechanical difference with larger diameter of screws in his study where they used multiple 3.5 mm and 4.5 mm self tapping corti-

cal screws with only three cortices.Hoiness *et al*[3] in their study of 64 patient concluded that 2 tricortical screws are biomechanically more stronger than single quadricortical screw and also weight bearing can be started early in tricortical screws. Cox *et al*[4] in a study on cadavers advocated for bioabsorbable screws.Clanton TO *et al*[5] in a cadaveric study compared between the stability between 3.5 mm quadricorticalscrew, syndesmotic fixation with one suture anchor and divergent 2 suture anchor and concluded that all modes of fixation were acceptable ,comparable but fixation with single suture anchor provided least resistance to posterior translation. They also emphasized that with none of the technique preinjury level could be achieved.

Results and Analysis :

In all of our cases we allowed protected weight bearing at 6 weeks. In all the 34 cases where the syndesmosis was fixed with 2 tricortical 3.5 mm screws there was no incidence of screw breakage. Whereas among 16 cases where single screw holding 4 cortices were hold there was incidence of breakage of 2 screws but the patients didn't have any subjective complaint. In 4 of our cases we had skin complications on fibular side. The skin complications were directly proportional to length of surgery. All these subsided with regular dressing. We had to remove implant in 7 cases due to prominent hardware. There was no incidence of any non union. There was no loss of reduction in due course of time. The syndesmosis fixed with single suture anchor didn't have any problem or loss of any reduction but we are not in a position to comment anything as the number of cases were less and the follow up period was very less but according to literature this is the demand of time. Though this technique is demanding and cost is more. We don't have any experience with bioscrew.

So in our study the results of 2 screws 3.5mm with tricortical purchase are better for fixation as well as early weight bearing can be given.

Conclusion :

In syndesmotic injuries the fixation is must. At least 2 screws with 3.5 mm diameter should be usedwith holding of 3 cortices. In these patients early weight bearing can be started without removing the screws. Biodegradable screws and suture anchor fixation is the future but are technically demanding and needs further study.

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