

Short Term Results with Z Plasty for Checkrein Deformity Following Tibia Fractures

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Abstract

Introduction: Checkrein deformity is rarely seen following fracture in the leg bones. The surgical treatments is the method of choice but the site of release at the fracture site or at the midfoot are debatable. Since the deformity is rare the literature is scarce. We evaluated six cases of such deformity after releasing the tendon behind the medial malleolus.

Methods: Six patients were followed after releasing the tendon and performing Z plasty lengthening midway between the previously described procedures.

Results: We achieved full correction of the deformity with satisfaction in all the six cases and had no recurrence with minimum 2 years following surgery.

Conclusion: The method described is simple, effective with less learning curve however larger series is required to compare it in a randomised control manner.

Key Words: Checkrein deformity, Complications of fracture healing.

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Introduction

Checkrein deformity is defined as the dynamic flexion deformity of the hallux due to tethering of flexor hallucis longus tendon, after the fracture of lower limb either due to callus or due to sub clinical compartment syndrome, Clinical test is simple. Planter flexion causes correction of the deformity while as dorsiflexion aggravates it. [Fig. 1] Surgical treatment is the method of choice. The methods involved are simple adhesion lysis at fracture site, lengthening of FHL at fracture site or Z plasty at midfoot without release at fracture site. The recurrence rate of the former is reported to be high and needs extensive release of the tendon at the fracture site while as the mid foot release is regarded as scar forming surgery with persistent pain. This study was aimed to analyse the results of surgical release for checkrein deformity midway between the fracture site and midfoot so that the complications of both procedures are minimised. Since the structure are well differentiated at the flexor retinaculum behind the medial malleolus, identification of flexor tendon is easy.[Fig. 2] The correction needed can be assessed and lengthening can be achieved.



Fig. 1: Showing the deformed hallux on dorsiflexed foot and corrected hallux on planter flexion



Fig. 2: Showing diagrammatic representation of FHL tendon along its course with easy identifiably behind the medial malleolus

Methods

Over the period of three years, six patients of checkrein deformity were treated at B N J Hospital. The mean age was 29 years (average 22-45). We had four males and 2 female patients. All patients had fracture tibia. Four were managed with long leg cast and two patients were operated and Interlocking intramedullary nailing was done.

The average duration from fracture to deformity was six months (average 4-11months). Surgical correction was achieved in all cases.

Release was done above the level of flexion retinaculum under tourniquet cover. All the structures were first identified following by the release of FHL. Z-plasty Lengthening was done in all cases. Slipper boot cast was applied post operatively to hold the corrected position. [Fig. 3]



Fig. 3: Showing post-operative correction achieved and supported with plaster slab

Results

Correction was achieved in all cases. All patients were satisfied with the procedure and there was no recurrence after minimum 2 years of follow up.

Discussion

Checkrein deformity is one of the less common deformities associated with the fractures of lower limbs. Although most common involved tendon is the flexor hallucis longus tendon, involvement of flexor digitorum longus is also mentioned in literature. Very rarely hypotrophy of Extensor hallucis longus can also present in similar way.^[1,2]

Previously regarded as the rare deformity of FHL following fracture of tibia (Clawson)^[3] it was also reported after fracture fibula by Leitsuh^[4] who found the tendon adherent to the healed fracture. Corr^[5] reported such deformity after fracture of calcaneum and mentioned the use of computed tomography to locate the entrapped tendon in callus. The flexor hallucis longus tendon arises from the inferior two-thirds of the

posterior surface of the fibula and interosseous membrane which makes it vulnerable to entrapment.

Lee et al^[6] analysed two types of surgical repair for checkrein deformity, one with release of adhesions and Z-plasty lengthening at the musculotendinous junction above the ankle at the fracture site and the other technique involving lengthening of the flexor hallucis longus in the midfoot. The authors noted prolonged success with the latter procedures while the more proximally-based procedures had varying degrees of recurrence to the formation of new adhesions. However the scar formed at the midfoot can lead to chronic morbidity as it impairs the foot wear or weight bearing.^[7,8,9] So the procedure done at the site which is in between the above two is better in a way that the structures are easily identified and the procedure is simple. No fracture exposure is required and the morbidity caused by the sole scar can be avoided.

Conclusion

In the above mentioned series of six cases, correction was achieved in all and we did not find any recurrence till now. So the procure is easy, safe and has less learning curve. However a larger series is needed to see the effectiveness of such procedure and a randomised control trial is needed to compare the three methods.

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