International Journal of Biomedical and Advance Research
ISSN: 2229-3809 (Online); 2455-0558 (Print)
Journal DOI: 10.7439/ijbar
CODEN: IJBABN

Case Report

One stage deformity correction of stiff nonunion of mid shaft first metatarsal fracture by open reduction and internal fixation with locking reconplate: A case report

Anil Kumar S.V, Parvataneni Prathap*, Vineetha Vittal, Nagakumar J.S, and Manohar P.V

Sri Devraj Urs Medical College, Tamaka, Kolar, Karnataka 563101 India

***Correspondence Info:**
Dr. Parvataneni Prathap
Sri Devraj Urs Medical College,
Tamaka, Kolar, Karnataka 563101 India
E-mail: prathap_parvataneni@yahoo.com

Abstract

Fractures of metatarsal are most common fractures in children foot. Most common causes are direct injuries to the fore foot.Here we present a case of non union metatarsal shaft fracture with 90degrees deformity treated by open reduction and internal fixation with locking recon plate in a single sitting.

Keywords: metatarsal, non-union, locking recon plate

1.Introduction

Fractures of metatarsal are most common fractures of foot in children accounting upto 60% of all pediatric foot fractures[1-3]. The fractures result mostly from direct injury. Non union of the metatarsal occurs mostly due undiagnosed fracture, infections, in adequate immobilization at the time of fracture, misalignment at the time of immobilization, premature removal of the cast or other immobilizer or loss of bone at the time of injury.

2. Case Report

A 16 years old male presented with complains of deformity in the left foot from 10 years. Patient gives history of trauma to left foot 10 years back.

Patient initially was treated by a local osteopath at the time of injury who immobilized the limb with bamboo sticks. No radiograph was taken before or after. No history of recent injury to the left foot either directly or indirectly.

On inspection there is a bump present on dorsum of foot. On palpation the bump was non tender, around 6cm length 4cm width and 3cm height extending from base of great toe and to head of first metatarsal. It was a bump with well defined edges and hard in consistency. Swelling is non pulsatile and immobile.

Anterio-posterior and oblique radiographs revealed mal union of mid shaft fracture of first meta tarsal with 90 degrees of deformity and hypo plastic second and third metatarsals.

Patient was treated surgically by open reduction, shortening and internal fixation with locking recon plate. Post operatively he was immobilized with below knee slab which was converted into walking cast after three weeks. Check x ray shows complete correction of mal union. Suture removal was done on 14th post operative day and below knee walking cast has been applied. Cast was removed after 6 weeks and follow up radiographs shows good signs of anatomical union. Thus 90 degree deformity of foot is corrected in single sitting.

Figure 1: Clinical Photographs of foot showing bump on the dorsal surface.

Figure 2: Anterio posterior and lateral radiograph of the foot showing malunion of first metatarsal with 90 degree deformity

Figure 3: Intra operative picture showing open reduction and internal fixation with locking recon plate

Figure 4: Post Operative radiographs showing deformity correction

3. Discussion

Fractures of metatarsal are most common fractures of foot in children, accounting for about 60% of all pediatric foot fractures[1-3]. Owen *et al*[4] showed in an epidemiologic study that in children younger than 5 years of age 73% of metatarsal fractures involve first metatarsal, where as in children older than 10 years these fractures accounted for only 12%.20% of first metatarsal were not diagnosed in their series.

Metatarsal fractures result either from direct or indirect injury. Direct injuries are mostly by heavy loads falling on the forefoot or a crush injury. Singer *et al*[5] found in a recent study if patient is less than 5 years the primary mechanism was fall from a height and this usually occurs within the home.

First metatarsal is shorter, wider, stronger and more mobile than others. First metatarsal along with two sesmoid bones under the head of first metatarsal bears approximately one third of the body weight. The tibialis anterior attaches to the inferomedial base, functioning in elevation of the 1st metatarsal and supination of the forefoot. Peroneouslongus attaches on the proximal lateral base, functioning in plantar flexion of the first metatarsal and pronation of the forefoot. There are no interconnecting ligaments between the 1st and 2nd metatarsals, allowing for independent motion. Injuries to the 1st metatarsal are usually due to direct trauma and are often open or comminuted. The dorsalis pedis artery and deep peroneal nerve are in this area, and branches of the superficial peroneal nerve are around the deeper structures and must be protected during surgery.

Non union is defined as a condition in which fracture does not unite after nine months from the time of injury. The common causes of non union is, undiagnosed fracture, infection, in adequate immobilization at the time of fracture, misalignment at the time of immobilization, premature removal of the cast or other immobilizer or loss of bone at the time of injury.In our condition the cause of metatarsal in most likely to be un diagnosed fracture.

Diagnosis in these conditions is mainly by clinical examination and Anterio posterior and oblique radiographs.

Surgical correction of metatarsal non union gives good results. The surgical technique includes patient supine position under the Sub arachnoid block (SAB) an incision was made from the talo navicular joint to first metatarsophalangeal joint. Ends of the fracture fragments are freshened. Both the fragments are aligned in anatomical position and fixed with five holed locking recon plate. Skin closed in layers and patient was immobilized in below knee slab.

4. Conclusion

The 90 degree deformity of the non united first metatarsal can be corrected in a single sitting by open reduction and internal fixation with locking recon plate.

References

[1] Crawford A. Fractures and dislocations of the foot and ankle. In: Green NE, ed. Skeletal Trauma in Children. Philadelphia: WB Saunders; 1994:449-516.

[2] Curtis MJ, Myerson M, Szura B. Tarsometatarsal joint injuries in the athlete. *Am J Sports Med* 1993; 21(4):497-502.

[3] Fisher MC, Goldsmith JF, Gilligan PH. Sneakers as a source of Pseudomonas aeruginosa in children with osteomyelitis following puncture wounds. *J Pediatr* 1985; 106(4): 607-609.

[4] Owen RJ, Hickey FG, Finlay DB. A study of metatarsal fractures in children. *Injury* 1995; 26(8):537-538.

[5] Singer G, Cichocki M, Schalamon J, *et al*. A study of metatarsal fractures in children. *J Bone Joint Surg Am* 2008; 90(4):772-776.