

Outcome In Surgical Treatment Of Comminuted Navicular Fracture Using K-Wiring And External Fixation – A Case Report

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INTRODUCTION:

Isolated comminuted navicular bone fracture is rare (1), but it may end up with serious complication as navicular bone serves an essential role in talonavicular joint and served as an integral part for medial column of the foot structure (2). A report of 10 cases for internal fixation of complex fracture of tarsal navicular with locking plates shows satisfactory outcome (2). However, there is not many case report or study that shows or compares the outcome in treating comminuted navicular fracture using K-wiring and external fixation.

CASE STUDY:

A 50-year-old lady who alleged motor vehicle accident sustained closed comminuted fracture of right navicular. Patient decided to proceed with external fixation with K-wiring of right navicular after given other options such as locking plate and conservative treatment.

Navicular bone is a longer bone lying transversely across the from the medial to middle of the foot, it is crossed by the tendon of tibialis anterior muscle and extensor hallucis longus superiorly. Choosing the site of incision (medial or lateral to tibialis anterior tendon) greatly depends on where the fracture mainly situated.

In this case, an antero-medial incision was made over right foot (medial to tibialis anterior tendon), tibialis anterior tendon was identified, retracted laterally. Talonavicular joint capsule opened to access into fracture site and visualized talonavicular joint surface. Big and small intrarticular bone fragment were reduced as anatomical as possible and holding with chosen position percutaneous k-wires (which later will be embedded under the skin).

In order to gain a good view of the navicular joint surface (to talus), an external fixator are needed as “ligamentotaxis”, a shuntz pin (4mm pin) was inserted at the talus neck and another pin at medial cuneiform (through to middle cuneiform to get good purchase). The external will serve as a tool for reduction as well as maintaining the medial column length until the bone unite.

In this case, we noticed the incision was too medial to the fracture comminution, a more

lateral incision (lateral to the tibialis anterior) will give a better view the the mid and lateral portion of the navicular bone.

Post-operative, K-wire and external fixation were kept for 6 weeks with non-weight bearing. At 6th week post operation, radiological finding showed callus formation. All devices were removed at 6th week post operation. At 8th week post operation, X-ray showed fracture united with no pain over the fracture site. Patient was allowed for full weight bearing. At 4th and 5th month of follow up, patient was able to ambulate with no pain and minimal pain on recreation activity such as jogging. AOFAS score is 95 (pain 40; function 40; alignment 15). No infection was noted over the wound site throughout the follow up.



DISCUSSION:

Isolated navicular bone fractures of the foot are rare, but a correct management of these fractures is mandatory because talonavicular joint is vital. Loss of this joint can result in loss of 90% or greater of complex hind foot motion or circumduction (3). A study published by Cronier P in 2013 gave a conclusion that using locking plate in treating comminuted navicular fracture shows promising result. In this case, patient was unable to pay for the locking plate due to financial constrain, thus she opted for external fixation with K-wiring and we can see that fracture was successfully healed in-situ with no pain from 2nd month onwards and AOFAS score of 95. However, long term follow up for the patient should be carried out as long term complication such as arthritis may occur in the future.

CONCLUSION:

Using external fixation with K-wiring (embedded under skin to allow longer duration fixation and reduce infection) in treating comminuted fracture of navicular bone in our center shows promising result. However, more