Case Report

Anchor sutures in orthopaedics: A case report

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Abstract

Background: Small fracture fragment fixation has always been an challenge in orthopaedics and trauma surgery due to small bone stock, comminution and risk of fragment fragmentation following usage of conventional implants. Anchor suture fixation has emerged as an effective alternative or adjunct to screws, wires, and plates, particularly when fragments are too small or osteoporotic to securely hold rigid implants This article reviews two case scenarios where anchor sutures were used to fix the small fracture fragments.

Key words: Anchor sutures; Small fracture fragments; Fragile fragments

1. Introduction

Selecting an implant for fixing a small bony fragments in periarticular fractures, avulsion injuries, and osteochondral lesions is always a dilemma among orthopaedic and trauma surgeons .Conventional fixation methods such as screws or Kirschner wires may be unsuitable when fragments are thin, comminuted, or attached primarily through soft tissue.Suture anchors (fig 1) , originally developed for soft tissue fixation, have expanded indications in fracture management by allowing indirect fixation through ligamentous or tendinous attachments while preserving fragment viability. Anchor sutures are available as bioabsorbable anchors or metal anchors (titanium), pre-loaded with suture material (commonly used material is UltraHigh Molecular Weight Polyethylene UHMWPE)

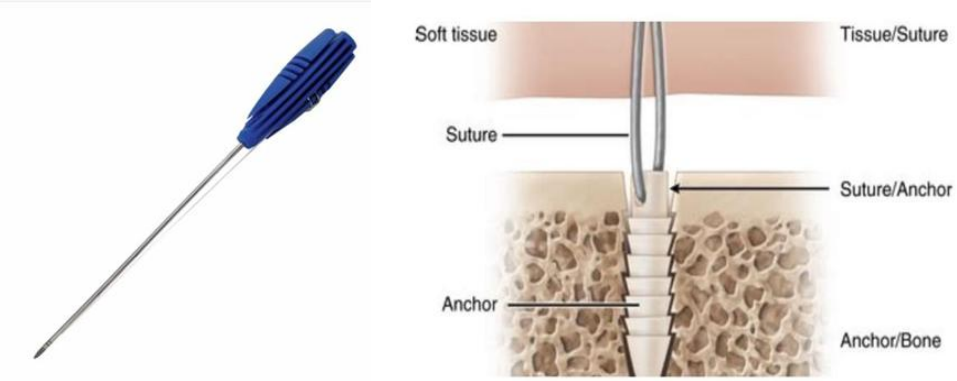

Fig (1): Anchor sutures loaded

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2.1. Case report 1

A 51 years old male patient presented in emergency room (ER) with an alleged history of road traffic accident (RTA). He had pain in right wrist and difficulty in moving wrist. X ray right wrist-AP &lat view taken and diagnosed with distal radius avulsion fracture with Volar dislocation of radio carpal joint (a Volar Barton variant) (Fig 2). Fracture was fixed with open reduction and fragment was stabilised with 5mm anchor sutures (Fig 3). Post-operative immobilisation was done for 3 weeks in a below elbow slab in mild Volar flexion. After 3 weeks' slab was removed and gentle wrist mobilisation started.

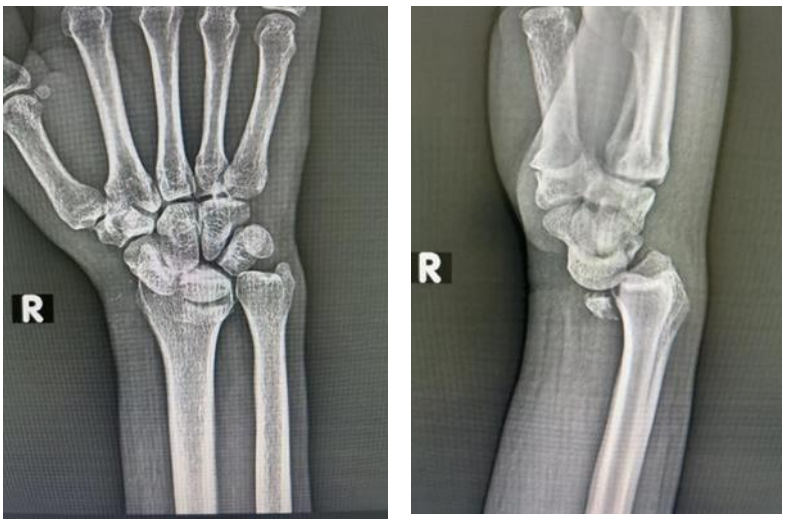

Fig (2): Wrist AP and Wrist lat

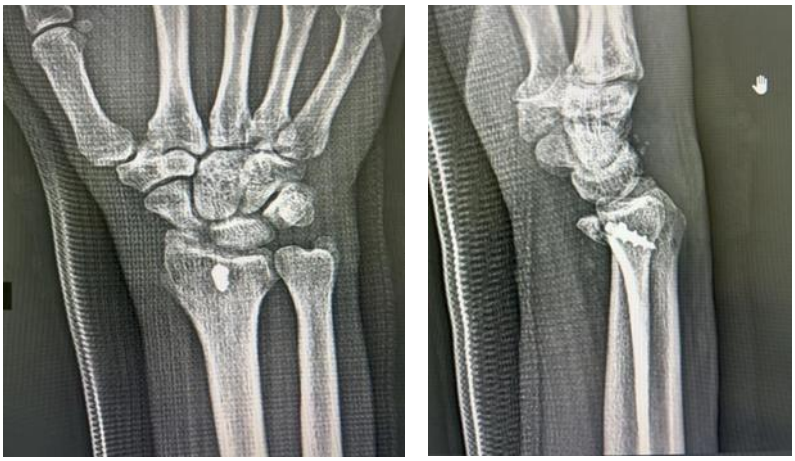

Fig (3): Wrist AP post op and Wrist lat post op

2.2. Case report 2

A 31 years old male patient received in ER with an alleged history of RTA. He had pain and difficulty in moving left shoulder. X ray left shoulder AP view and MRI taken for shoulder and diagnosed with left greater tuberosity displaced fracture (fig 4). Arthroscopic fragment reduction and fixation done with two anchor sutures (fig 5). Shoulder immobilised for a period of 3 weeks, later physiotherapy started and has recovered fully with full range of movement

Fig (4): Shoulder AP preop

Fig (5): Shoulder AP post op

3. Discussion

Anchor suture fixation relies on tension-band and indirect reduction principles rather than rigid compression. The anchor is inserted into stable host bone, and sutures are passed through the attached soft tissue or around the fracture fragment. When tensioned, the sutures pull the fragment into anatomic position against the parent bone, converting tensile forces into compressive forces across the fracture interface. Anchor sutures helps in load sharing between bone and soft tissue, preserves the vascularity of the fragment, allows micro motion which favours bone healing. The scope of using anchor sutures in fracture fixation have increased over a period of time, they are now indi-

cated in avulsion fracture of - greater tuberosity -tibial spine- malleolar fractures -olecranon or patellar pole fractures, periarticular fractures, comminuted fractures where screws cannot be used, osteoporotic fractures.

4. Conclusion

Small fragment fracture fixation with anchor sutures is a versatile and effective technique in modern orthopaedic practice. By leveraging soft tissue attachments and indirect fixation principles, anchor sutures provide stable fixation while minimising iatrogenic damage to fragile fragments. As implant technology and surgical techniques continue to evolve, anchor suture fixation is likely to play an increasingly important role in the management of complex and small fragment fractures.

Reference

1. Seppel, G., Saier, T., Martetschläger, F. et al. Single versus double row suture anchor fixation for greater tuberosity fractures – a biomechanical study. BMC Musculoskelet Disord 18, 506 (2017). https://doi.org/10.1186/s12891-017-1868-7