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Radius stress fracture- A rare case report and review of literature

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Abstract
Introduction: These fractures are a result of cyclical application of normal forces to normal bone with excessive frequency. Amongst the stress fracture occurring in different bone mid shaft radius stress fracture forms an extremely rare finding.
Case Report: We present a 54year old male with a right mid-shaft radius stress fracture following distal end radius intra-articular communited fracture surgery with radial distractor. Later, managed with ORIF Plating and above elbow slab.
Conclusion: Although a rare site for stress fracture but cyclical application of forces applied to a fixed point in bone can lead to stress fracture.

Keywords: stress fracture, radius, intra-articular, ORIF

Introduction
Stress fractures are less common in the upper extremities than the lower extremities, they are usually found in the meta-tarsals and tibia of the lower extremity, and most commonly in ulna when it comes to the upper limb [1]. They fall on the etiological classification of fractures where cyclical application of of normal forces to normal bone with excessive frequency leads to the development of fractures. Amongst the stress fracture occurring in different bone mid shaft radius stress fracture forms an extremely rare finding [2]. These fractures are usually described in sports medicine but these days they are also seen with individuals with osteoporosis and osteomalacia [3, 4]. This case reports an 54year old male with a history of RTA having multiple fractures and how post operatively of his distal end radius fracture managed with Radial Distractor lead to mid-shaft radius stress fracture in a nutritionally poor individual with osteoporosis.

Case Report
Here, in this study we refer to a 54 year old male from a third world country, daily wage laborer by professtion who first presented to us after RTA with poly trauma. He suffered fractures of mid-shaft humrus, tibia mid shaft, distal end of radius comminuted fractures and head injury. He was stabilized and after that he was surgically treated. For his distal end of radius fracture *[Fig 1]* a radial distractor external fixation was done. After 4 weeks of radial distractor it was removed. Upon removal mild pain in the mid shaft radius with inability to supinate and pronate the forearm was noticed. Following this Plain radiographs demonstrated open physes and no obvious fractures, but on close review there was a subtle, nonspecific, transverse sclerotic line in the middle third of the radial diaphysis
On examination it was found to be painful at the site and nil mobility at the fracture site was noticed. He was initially on above elbow slab after which we did open reduction and internal fixation for him with a Plain DCP Plate. The patient came post operatively after 2 weeks with improvement in pain and range of motion. And overtime he returned to his daily activities with almost full range of motion and no residual supination lag.

Discussion
Stress fractures in the lower extremities result from repetitive weight bearing in individuals, soldiers, and athletes exposed to overloading the skeleton beyond the ability of bony tissues to relax from mechanical and metabolic stress resorptive phenomenon. Lack of weight-bearing activities in the upper extremity spares the bones of the upper extremity from stress fractures [7].
Stress fractures are usually very common in gymnasts, military recruits, tennis player and cyclists. Many individual cases have been reported in literature where gymnasts developing radial stress fracture [5] or tennis player developing ulnar shaft stress fracture. But, mid shaft radius stress fracture following distal end of radius distractor surgery at its proximal pin entry is very uncommon.
The patient had RTA following which he underwent remarkable surgery for distal end radius communited fracture with radial distractor [Fig 2]. 4 weeks later after removal of the distractor he stared developing pain and decreased range of motion. Detailed examination showed full pronation but restricted supination where the hand was arrested in mid supination and he complained of pain on forceful supination. Also, had an increased

localised temperature and redness. Upon X-ray it showed faint fracture line at the proximal pin entry site without any significant trauma. (Fig). Ideally we should have done an MRI to confirm our diagnosis of a stress fracture but X-ray clearly showed bicortical breach and a faint fracture line.

In our case, it was thought that the likely mechanism of injury was due to a combination of tractional and torsional force, together with direct pressure provided by the proximal pin of the distractor which is actually based on the load and overload of a bone where the pin distraction caused force deformation along the mechanical axis of bone and hence lead to stress fracture [6].

The patient complaints didn't subside with conservative treatment, stress X-rays showed [Fig 3] distal end radius fracture site no mobilty nor mid shaft radius stress fracture showed mobilty but ultimately we operated the patient with open reduction and internal fixation with plain dcp platting [Fig 5] in order to return his range of motion and improve his DAILY, so that he can return to his work at the earliest. The intra-operative images [Fig 4] and c-arm shoots [Fig 5] show the fracture clearly.

Now, arises the role of osteoporosis and Vitamin D deficiency in individuals to develop stress fractures in spite of significant repetitive micro-trauma. Being from a third world country and nutritionally poor society it predisposed the individual for a stress fracture. Though the patient didn't have any documented severe endocrine disorder but he had low serum calcium levels.

Post operatively he followed up in our out patient department at 4weeks time and he developed near normal range of motion and pain free range of motion [Fig 6].

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest

Fig 1: Post Trauma Forearm X-Rays- A:Ap B: Lateral Showing Distal End of Radius Fracture

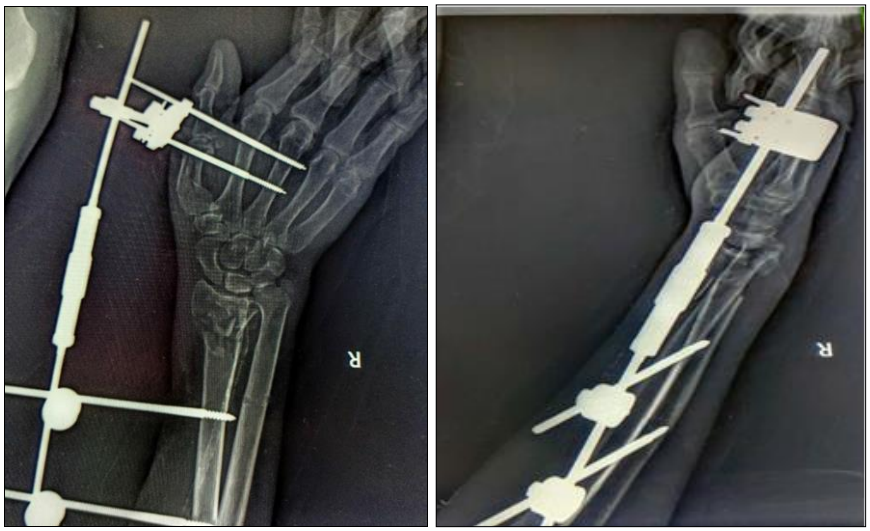

Fig 2: Post-Operative Radial Disctractor Insitu X-Ray

Fig 3: Post Implant Removal X-Rays Showing Stress Fracture A: Ap B: Lateral

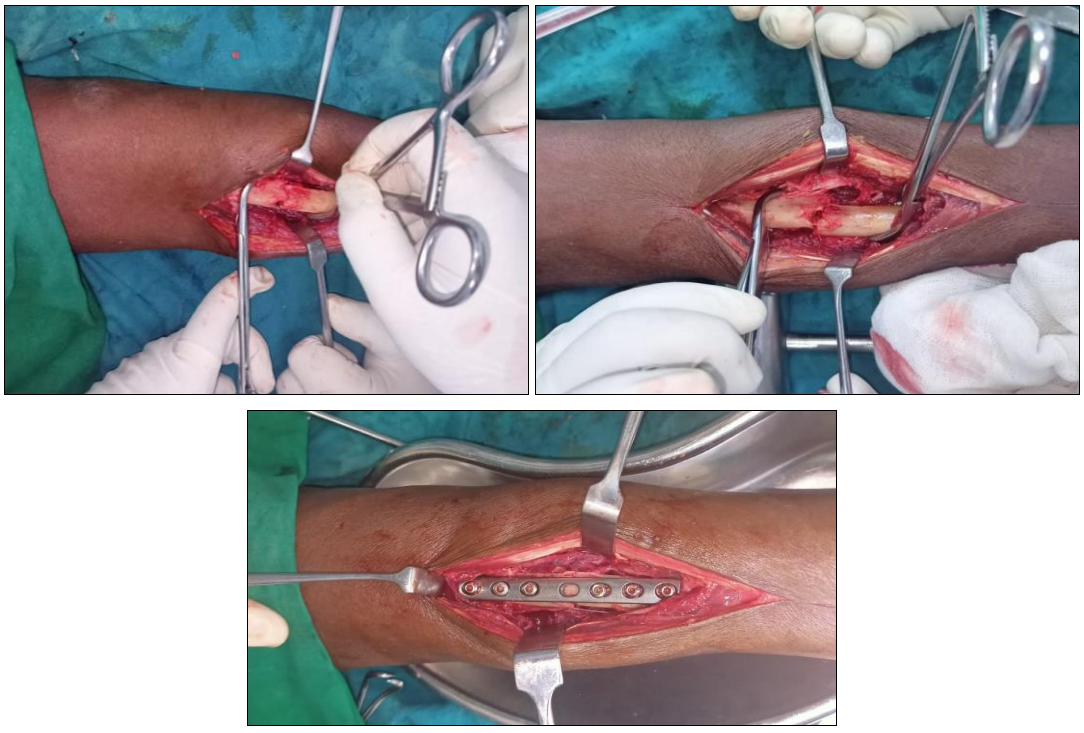

Fig 4: Intra Opeartive Fracture Site Pictures

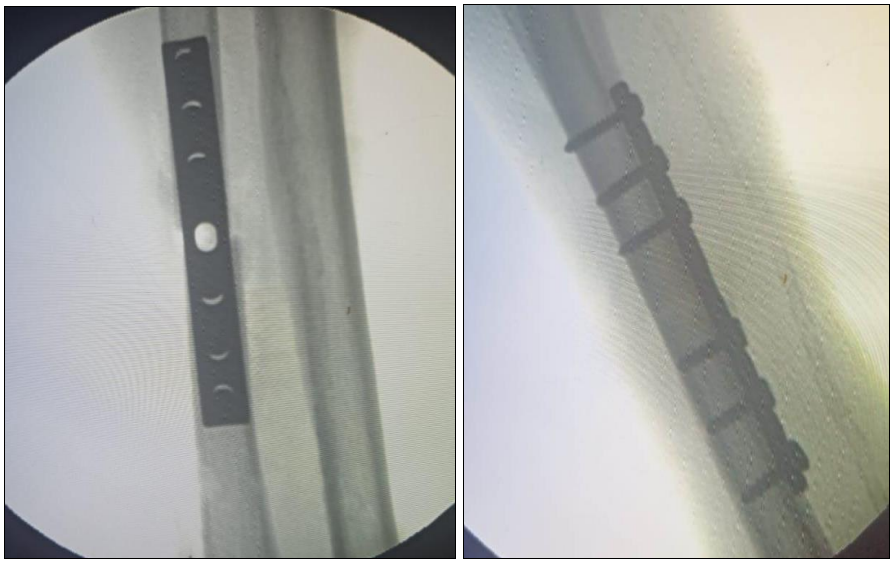

Fig 5: Intra Operative C- Arm Pictures of The Reduction

Conclusion

There is always a risk of stress fracture upon implant removal site when the patient suffers from osteoporosis. Hence, it is wise to delay weight bearing or heavy lifting after implant removal surgery. Stress fractures can be very notorious when it comes to their diagnosis and management. So care must be taken in elderly persons to avoid stress fracture and nutrition should be built up in them.

References

1. Farquharson-Roberts MA, Fulford PC. Stress fracture of the radius. The Journal of bone and joint surgery. British,1980:62(2):194-5.
2. De Boeck H, Verhaven E, Casteleyn PP. Stress fracture of the radius following non-union of an isolated fracture of the ulna. Archives of orthopaedic and trauma surgery,1992:112(1):39-41.
3. Chalmers JW, Conacher WD, Gardner DL, Scott PJ. Osteomalacia–a common disease in elderly women. The Journal of bone and joint surgery. British,1967:49(3):403-23.
4. Devas MB. Stress fractures. Churchill Livingstone, Edinburgh, 1975.
5. Carek PJ, Fumich RM. Stress fracture of the distal radius: not just a risk for elite gymnasts. The Physician and sportsmedicine,1992:20(5):115-8.
6. Chamay A. Mechanical and morphological aspects of experimental overload and fatigue in bone. Journal of biomechanics,1970:3(3):263-70.
7. Patel MR, Irizarry J, Stricevic M. Stress fracture of the ulnar diaphysis: review of the literature and report of a case. The Journal of hand surgery,1986:11(3):443-5.
8. McRae's Orthopaedic Trauma and Emergency Fracture Management by Timothy O White BMedSci MBChB FRCSEd (Tr & Orth) MD.