

# Stress fracture of ulna due to excessive push-ups

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## Abstract

Stress fractures are most common in the weight-bearing bones of the lower extremities and spine, but are rarely found in non-weight-bearing bones of the body. Stress fracture of the ulna is extremely rare. We report a case of complete stress fracture of ulna caused due to excessive push ups in a young athlete. Conservative management was successful in healing of fracture and returning this patient back to his previous activity level. Physician should have high index of suspicion, whenever they encounter a young athlete complaining of forearm pain.

**Key words:** Diaphysis, insufficiency fracture, stress fracture, ulna

## INTRODUCTION

Stress fracture is a partial or complete bone fracture that occur due to repeated application of stress lower than the stress required to fracture the bone in a single loading. They frequently occur in lower extremity but rarely occur in upper extremity. The middle third of the ulna is the commonest site as this region has the thinnest cortex and smallest cross-sectional area morphologically compared to the proximal or the distal third, and is vulnerable to stress from torsional forces.<sup>[1]</sup> Stress fractures of ulna have been reported following weight lifting and use of crutches. We report a case of stress fracture in a cricketer, developed after doing excessive push ups. To the best of our knowledge, this case is the first report of ulna stress fracture after doing excessive push ups.

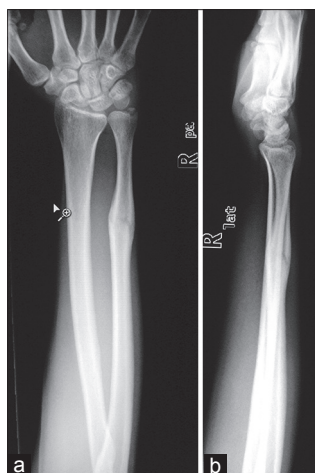
## CASE REPORT

A 24-year-old cricketer had a seven month history of increasing pain of the ulnar diaphysis of left forearm. Patient reported that he had started on excessive daily

training program seven months before this episode of pain. He used to do daily push ups for about one hour in the morning and evening. The pain in her left forearm gradually became worse, and he experienced difficulties while playing cricket. The pain relieved by taking some rest and by using analgesics. He continued to have persistent pain despite oral analgesics, but he continued the push ups. Finally while doing push ups one day his pain over the forearm suddenly exacerbated followed by a feeling of snapping sound. Following this, almost all activity with the arm was painful. At that point he was unable to do any activities with his left forearm and he then presented with us. On examination, palpation along the left forearm elicited pain, tenderness, crepitus and mild swelling at the middle third of the ulna, however there was minimal pain on pronation and supination of the forearm and flexion and extension of the wrist and the elbow. Radiographs of the forearm were immediately obtained. It revealed undisplaced fracture of middle third ulna [Figure 1]. On reviewing the typical clinical history and radiographs, we made a diagnosis of stress fracture of ulna.



**Figure 1:** Radiograph of the left forearm showing stress fracture of middle third ulna



**Figure 2:** (a, b) Anteroposterior and Lateral radiograph of the left forearm showing complete union of the fracture after six weeks of immobilisation

As the patient didn't wanted surgery so he was treated with long arm cast for six weeks. After six weeks of conservative management, his pain disappeared and radiographs showed union at fracture site [Figure 2]. At one year follow-up, complete recovery was achieved and there were no training limitations.

## DISCUSSION

Stress fractures of the ulnar diaphysis have been described in soft ball pitchers,<sup>[2]</sup> body builder,<sup>[3]</sup> bowlers<sup>[4]</sup> and golfers.<sup>[5]</sup> The aetiology of these fractures has been described as either a traction injury of the hand flexors and extensors<sup>[2,3]</sup> or related to torsional forces associated with excessive pronation and supination.<sup>[6]</sup> In all the reported cases, the patient returned to activity in four to six weeks after a period of rest from the aggravating activity, and after gradual resumption of activity. In our case, the patient had to put his hands on ground with

elbow and wrist extended and put the whole body weight over it. The classic history of repeated stress over forearm, exercise associated bone pain and typical examination findings are highly correlated with diagnosis of stress fracture. This mechanism of axial loading has previously been reported in a case of cyclic weight bearing associated with crutch use.<sup>[7]</sup> During axial loading, the radius carries most of the load (82%) and the ulna carries a smaller load (18%), but the load along the ulna increases when the wrist is a position of flexion, ulna deviation, and forearm pronation.<sup>[8]</sup> Therefore we hypothesize that the cause of the fracture was due to axial loading during excessive muscle training.

Although surgical intervention in such cases are preferred, but since our patient didn't wished surgery so he was managed conservatively. It has been estimated that between 5-10% of all sports-related injuries involve stress fractures and a good proportion of these result in delayed union or nonunion. Hulkko *et al.*, estimated delayed union or nonunion in 10% of stress fractures in Finland.<sup>[9]</sup> The reason for these poor results is twofold: Delayed diagnosis due to late consultation of expert physicians, and too short a rest from hard physical activity. Furthermore in many cases, the diagnosis is difficult and repeated clinical, radiological examinations are necessary for early diagnosis and management. Early diagnosis and treatment are important to avoid late complications of these fractures. The mechanism of stress in present case is only speculative, but it suggests the possibility of stress fractures of the ulna diaphysis in individuals participating in excessive training regimens such as that outlined in this report. A high index of suspicion is the key to diagnosis.

## CONCLUSION

Stress fracture of forearm must be included in the differential diagnosis of athletes having forearm pain. The injury should be diagnosed early and treatment should be tailored accordingly.

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