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## A Radiolucent Foreign Body in the Elbow: A Date Palm Thorn in the Elbow.

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### ABSTRACT

Piercing injuries from radiolucent foreign bodies are common in India. In a patient who gave a clear history, a date palm thorn was removed by surgery from the elbow, from a place just anterior to the capitellum and surrounded by blackish soft tissue. The ultra-sonography had earlier predicted the foreign body exactly of the same shape and length. The incision planned must allow good chance of exploring the entire joint. Ultrasonography is a must before any suspected foreign body removal or in any synovitis. Radiolucent foreign bodies especially thorn or twigs must be suspected in all case of synovitis as they present a difficult problem.

**Keywords:** date palm thorn, radio-lucent, ultra-sonography, rare foreign body elbow

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## INTRODUCTION

In India, chances of thorn pricks are more, mainly in the foot region as barefoot walking is prevalent. These patients do not seek medical help unless they develop serious problems or else they are managed by self-traditional healers [1]. When it comes to a piercing radiolucent foreign body like a thorn, in India they are common in the foot presenting either as fungal and bacterial infections [1]. The date palm, *Phoenix. sylvestris* is present throughout India especially in Tamilnadu [2]. In southern Indian population, their thorn can cause a foreign body injury especially in the foot; more commonly pierce the body while climbing these trees. If parts of these thorns are left in the body, they may remain silent or cause complications like infection causing pain, developing into abscesses, sinuses, and granulomas. They can also cause physical pressure over tendons and nerves [3]. In the treatment of the pierced foreign body, the knowledge of the portal of entry of the foreign body is vital. When we are not sure where exactly the foreign body had entered the body, there is every chance that there is trouble in localisation of the foreign body. This logically causes longer operation time and in addition extensive dissection. Such foreign bodies can also be missed and leads to lawsuits against emergency doctors [3]. We present a case of foreign body in an unusual site.

### Case Report

A 22 year male farm worker presented with pain in the right elbow. Six months back when he was working in a date palm tree plantation, he climbed a date palm tree and fell down. He accidentally landed his elbow on the thorns on a date palm tree. He removed all the thorns he can and went home. 30 days later he developed severe pain in the right elbow with more pain on the lateral aspect of the elbow. This pain did not subside with analgesics. He presented to us. On examination there was diffuse swelling in the region of the lateral side of the triceps attachment into olecranon. Figures 1 a and 1b.



Figure 1 a and 1b: Clinical presentation of the patient, the swelling and the site of tenderness over the lateral aspect of the elbow

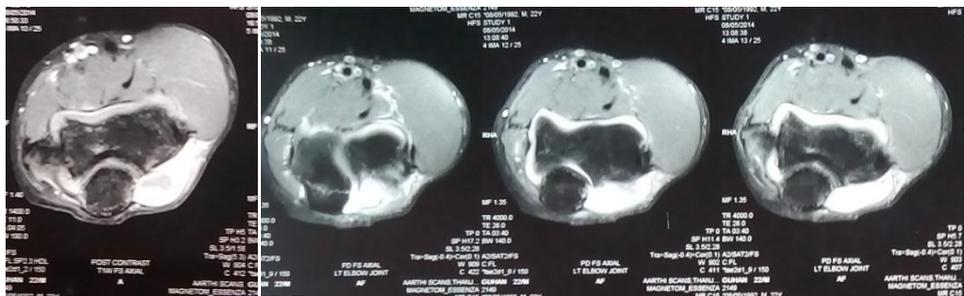


Figure 2a and 2b: The anteroposterior and lateral X-rays of the patient's right elbow.



**Figure 3:** The Ultrasound examination of the right elbow of the patient. The arrows mark the foreign body, the thorn.

His elbow radiographs were normal and unimpressive (Figures 2a and 2b). Musculoskeletal ultrasound of the right elbow (Figure 3) using a 12mHz USG probe showed a echogenic linear focus 20mm long suggestive of a foreign body in the lateral part of the lower border of olecranon process and head of radius along the posterior aspect. This long conical foreign body resembled a thorn. The capsule appears to be pierced. Synovial thickening with echogenic fluid are also seen in the right elbow.



**Figure 4a:** MRI of the patient shows transverse sections of the elbow with synovial reactions in the posterolateral aspect one lateral side of the olecranon.



**Figure 4b:** MRI of the patient shows coronal sections of the elbow with synovial reactions around the elbow.



**Figure 4c:** MRI of the patient shows longitudinal sections of the elbow with synovial reactions around the elbow

Figures 4 a to c show the –transverse ,coronal and sagittal MRI views of patient’s elbow showing soft tissue lesion on the postero-lateral aspect of the elbow suggestive of synovitis . This synovitis was reported to

be reactive or infective and was superior and lateral to the olecranon containing synovial fluid collection and a linear uniformly hypo-intense structure suggestive of a foreign body of approximate length 1.7cm. It was consistent with history of retained thorn.

After assessment from the anesthetist, the patient was taken up for exploration of the elbow. An incision in the line of upper part of Boyd's approach was made. As the plane between muscles was developed the bulging synovium was seen. At this site there was no sign of the thorn. The common extensor was erased and the anterior aspect of capitellum was explored. There was a black- thorn surrounded by blackish soft tissue. (Figure 5 and 6) The thorn with the blackish granulation like tissue were removed (figure 7) and sent for biopsy (figure 8). The thorn was preserved (figure 9) common extensor was reattached with drill holes made in lateral condyle. The wound was closed.



Figure 5: The thorn is being identified posterolateral to the olecranon

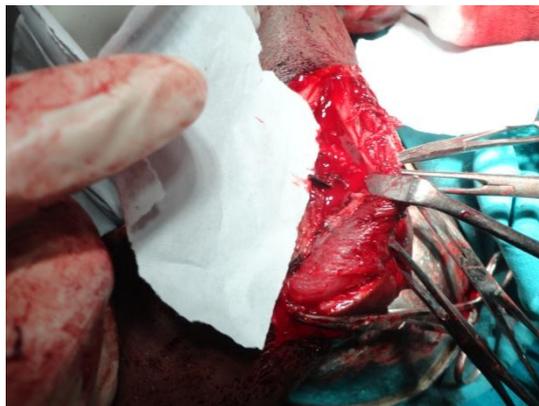


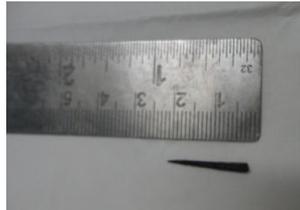
Figure 6: A sterile glove cover is kept to easily identify the thorn.



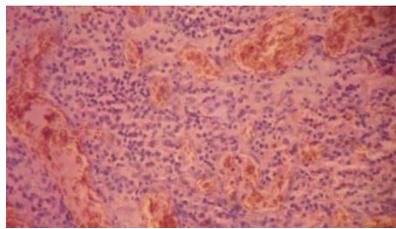
Figure 7: The thorn that was removed and the blackish granulation that was around the thorn



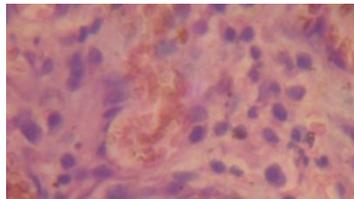
**Figure 8: Another view of the blackish granulation that was around the thorn.**



**Figure 9: The 2cm long thorn measured with a scale.**



**Figure 10: Histopathology: the 100 time magnification eosin and hematoxylin preparation showed the inflammatory cell invasion and vascular nature of the tissue**



**Figure 11: Histopathology: the 400 times magnified eosin and hematoxylin preparation showed the inflammatory cell invasion and vascular nature of the tissue**

The histopathology figures 10 and 11 were reported as proliferation of capillaries admixed with fibroblasts and chronic inflammatory cells with congestion. The elbow was immobilized in an above elbow plaster for three weeks. Then the plaster was discarded and the elbow was mobilized. At six months post operatively the elbow movement was regained and the range was from 10 degree of flexion deformity to 140 degree of flexion. The date palm tree whose thorn pierced him is presented in figures 12 and 13. A closer view of the thorns is presented in figure 14.

## DISCUSSION

Literature on the decision on routine synovectomy in thorn prick synovitis is equivocal. Sometimes only irrigation with two 1.6mm needles was found to be effective in washing out toxic materials and was recommended as adequate and synovectomy was reserved for resistant cases [4]. In this work there was no mention of the removal of the thorns, possibly in retrospect, in all these cases, the entire thorn might have been removed at the time of prick itself [4]. In contrast some authors have emphasized removal of thorn in addition to debridement in the form of curettage or synovectomy as the case may be [1,5].

At the time of the injury, the urge in removing the thorn by the patient himself might result the sharp end (the tip) of the thorn being left inside the joint [5].

The main factor that separates other vegetable thorns and date palm thorn is their sheer length. They can be as long as 10-15 cm [4] long enough to pierce any joint cavity as in our case, the elbow. These can be seen from the figures 12, 13 and 14. Simple tests like ESR and blood counts could make difference between the septic arthritis and thorn induced synovitis [4]. When the patient did not recall or volunteer a specific history of thorn pricks, then it is a diagnostic challenge, for example three cases of tumoral lesions of limb bones (tibia, fibula and metacarpal) later only turned out to be date palm thorn injuries [6]. From these lesions date palm thorns of length 3cm, 2.5cm and 2cm were only removed [6]. In our case we removed a 2 cm date palm thorn figure 9 as already mentioned.

In a retrospective study of 253 cases of foreign body intrusions, 137 were due to date-thorns. Of these most of them were sent as outpatient and only 27 cases had foreign body granuloma. This shows there was significant amount of thorn substance inside the body to produce a reactive foreign body granuloma. The alkaloid in the thorn is believed to cause this foreign body granuloma [7]. The history generally that the specific removal of full thorn at the time of the actual thorn prick must be confirmed. In India such definite history is lacking due to carelessness of the individual and late presentation. This is coupled with poor literacy. It is essential that one should explain the limitations of irrigations and the need for the second surgery in such patients. When we are sure about a piece of thorn, it is imperative that we remove in the first place. Interestingly in a case series of three cases remembered the date palm thorn prick on being shown the thorn after surgery. The worst problem is that the date palm thorn has migrated from the actual site of prick compounding the problem [6]. This is evident from even our case where the thorn which during the time of ultrasound was behind the radial head region and migrated at the time of surgery to between the radial head and capitellum. In swimmers sea urchin spine injury is an interesting history that will be useful [6].

In the Middle East, where there are a lot of date palm plantations, date palm thorn injuries should be suspected and naturally are common. In any case in children, the diagnosis can easily be missed [5-8]. If untreated and implanted the date thorn lead to late complications like periostitis or even osteomyelitis [5]. The presence of the date palm thorn was confirmed with ultrasound scan and computerized tomography metatarsal was curetted and thorn embedded in the periosteum of the fourth metatarsal in a 10-year-boy and was removed [5]. The lesion is specifically picked up by a good musculo skeletal ultrasound like in our case.

In Morocco, where also such type palms are common, an insidious lytic lesion was reported in a 20-year-old deaf mute patient. Surgical exploration revealed a 2.5-cm palm tree thorn embedded in the periosteum of the dorsal aspect of the fourth metatarsal base in granulation tissue, forming an abscess [8]. (rather on the plantar). So if one sees a lytic lesion of the bone, especially in children with or without deafness or aphasia [8], one needs to include a foreign body penetration as one of the differential diagnosis [8]. Our patient had no such disability and the diagnosis was made easier with a clear history and a good ultrasonogram. Only in such cases when there was a definite history of prick and the site of injury was correctly marked, the thorn was removed easily and the case was treated with less complications. But if no news about what pricked the part of the body e.g. date palm thorn, or wooden twig, then such foreign object will stay implanted.



Figure 12: The date palm plantation where the patient was working.



**Figure13: The upper part of the tree with thorns.**



**Figure 14: A close up view specifically showing the length of the thorns of the Indian date palm.**

Explored surgically, and a date palm thorn with aseptic granuloma causing lytic lesion of the medial cuneiform in a 10 year old boy was found [9]. Even in the absence of a definite history of trauma, an organic foreign body lesion should be considered in the differential diagnosis of a lytic lesion of bone [9].

Figures 13 and 14 show the palm tree plantation where the reported patient was working. The length of the thorn of the said date palm can be seen from figure 14. The date palm in India is cultivated in Kutch (Gujarat), Rajasthan, Punjab, Tamilnadu. Coming to the species Hooker in the *Flora of British India*, state *P.sylvestris* as wild and cultivated throughout the plains of India, Burma and wild in the Indus Basin and *P. dactylifera* has initiated by plantations into Sindh and Northwest India [2]. The date palm *P. sylvestris* is present throughout India especially in Tamilnadu [2]. The search with string -date thorn in elbow in literature did not reveal any result. There are date palm injuries of hand, feet and knee joints. The style of climbing these trees may have a bearing on this. The mode of fall on to his lateral side on a date palm tree might be the reason of it entering the elbow on the lateral side in our patient. The present of the thorn on the lateral aspect of the elbow joint is also points to a lateral entry.

In general plant thorn synovitis in elbow due to thorn fragments from *Acacia Arabica* was reported [10]. All of which were not diagnosed beforehand due to the paediatric age group and due to different presentations like septic arthritis of elbow or juvenile inflammatory arthritis. The diagnosis was difficult with common non-specific symptoms like pain, swelling, and decreased movements of affected joint. Neither the radiographs nor the ultra-sonography were helpful. The ultrasound revealed only hypertrophied synovium with minimal fluid in all the patients. All 4 cases were diagnosed only after arthrotomy and thorn fragments (*Acacia arabica*) were recovered from the hypertrophied synovium. Foreign body removal and sub-total synovectomy achieved satisfactory outcome and was recommended as the correct treatment [10] and sent for histo-pathology. None of their cases had any evidence of any organism [10].

Thus though rare ,plant thorn induced synovitis of elbow must be included in the differential diagnosis of mono-arthritis of elbow and a high index of suspicion was necessary for such retained thorn fragments in elbow joint causing synovitis [10]. They cause foreign body granuloma with giant cells. Common thorn prick injuries are from acacia, rose thorn, cacti, lemon tree [10]. Such penetrating injuries can set off

infections with different organisms including Actinomycosis. Sometimes plant thorn prick of elbow, foreign body is not revealed in ultrasound in all the cases [10]. But in our case pre exploration ultrasonogram (USG) it was useful. Ultra-sonography was recommended for localizing the position of the thorn with a marker on the skin before the removal of the thorn [10]. We agree that though MRI in our case was informative but not quite as precise as an ultrasound in this condition.

Detection of radiolucent soft tissue foreign bodies is a challenging problem, with near normal radiography. Blindly exploring is difficult [3]. When in a study, 51 patients with clinically suspected radiolucent soft tissue foreign body and with negative radiography were evaluated by USG with a 12-MHz linear array transducer and had foreign body removal was done under ultrasonography-guidance. 47 of them had foreign body; mostly (31 of them) were thorns. Ultrasound was positive in 50 patients. USG falsely predicted the presence of foreign body only in four cases and was falsely negative in one case. The ultrasound was 90.2%, accurate, 97.9%, sensitive, and 92% positive in predicting the foreign body which was radiolucent. Thus the real-time high frequency USG is very sensitive and accurate to detect radiolucent foreign bodies which are not obvious in radiography [3].

In our case the ultrasound prediction of the thorn was comparatively more accurate than the MRI prediction. i.e the length was predicted as 2cm in USG and 1.7 cm in MRI. The first investigation in any case with unexplained bony lesion or synovitis is clinical suspicion. This is vital, though the patient did not reveal a penetrating trauma. Ultrasonography is useful before any suspected foreign body removal or in any synovitis. The management of plant thorn synovitis of elbow is challenging. More careful investigations are needed in children as they usually do not give correct history.

#### CONCLUSION

The presented case is rare in the sense a date thorn had not been reported from elbow joint and this is the first one to our knowledge that a synovitis is reported from a date thorn prick. Planning the removal of the thorn needs proper planning and placing the incision should be such that the entire joint can be explored. This is vital as the thorn fragments have a capacity to move around. Subtotal synovectomy along with removal of the thorn is effective. Ultrasonography is a good diagnostic tool for diagnosis of radiolucent foreign body induced synovitis

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