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Case Report

Plant thorn synovitis of elbow in children

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ABSTRACT

Four rare cases of plant thorn synovitis of left elbow were admitted at our institution, which were initially misdiagnosed as partially treated septic arthritis of elbow or Juvenile inflammatory arthritis. All of them were of paediatric age group. Symptoms included pain, swelling, and decreased range of motion of affected joint. On examination synovitis was present in all patients.

Roentgenograms & Ultrasonography were inconclusive in all patients, Definitive diagnosis was made only after arthrotomy, Thorn fragments (*Acacia arabica*) were recovered from the hypertrophied synovium & subtotal synovectomy was done and sent for histopathological examination. All patients improved after surgery with mean residual flexion deformity of $12.5 \pm 2.86^\circ$. Plant thorn induced synovitis of elbow is rare, it must be included in the differential diagnosis of monoarthritis of elbow and a high index of suspicion is needed for retained thorn fragments in elbow joint causing synovitis. Its optimal treatment is arthrotomy, foreign body removal and total/subtotal synovectomy.

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1. Introduction

The insidious or acute onset of infective arthritis or post traumatic synovitis is often associated to penetrating injuries around the joints with an evidence of removal of penetrating agent by the patients themselves. If some part of foreign body is retained in the joint it triggers foreign body response in form of aseptic inflammation of joint. Plant thorn synovitis is a chronic relapsing type of synovitis. It is an unnoticed cause of monoarthritis when the trauma is forgotten and patient presents with pain and restricted movements of the joint occurring usually in children with or without features of infection. Retained thorn leads to foreign body reaction leading to hypertrophic synovitis, histopathologically it is a chronic

granulomatous synovitis with foreign body giant cells.^{1,2} Elbow is an uncommon site for thorn induced synovitis and only few cases have been reported in literature.^{3–5}

We describe four rare cases of plant thorn synovitis of elbow in children, which were misdiagnosed as partially treated septic arthritis of elbow or Juvenile inflammatory arthritis (JIA).

2. Observations

We had observed four patients (Table 1) who were admitted at our institution from Nov 2009 to Aug 2013, Aged between 10 and 18 years (with mean age of 14.5 years) considering as case of partially treated septic arthritis of left elbow or JIA, They

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Table 1 – Details of the cases reported.

S. No	Age	Raised local temp.	Swelling	ROM left elbow	Radiographs of elbow AP/Lat & USG	H/O thorn prick	No. of thorns	Histopathological report	ROM left elbow at 2 months follow up
1	11	Yes	+	30°–110°	Inconclusive	yes	2	Chronic nonspecific synovitis	15°–150°
2	14	Yes	+	30°–100°	Inconclusive	no	1	Chronic inflammatory synovitis with foreign body granuloma	10°–150°
3	15	Yes	+	45°–120°	Inconclusive	yes	1	Chronic nonspecific synovitis	10°–150°
4	18	Yes	+	40°–110°	Inconclusive	yes	1	Chronic inflammatory synovitis with foreign body granuloma	15°–150°

presented to us with history of pain, swelling and restricted movements of their elbow joints with mean time of presentation around two months (mean 57.75 days) with episodes of low grade fever. One patient had history of fall on the ground with a penetrating injury over the lateral aspect of the elbow which healed without any sinus, 2 patients presented with obvious history of plant thorn prick and also described removal of thorn from their elbow. One patient had no History of thorn prick injury. On examination there were multiple areas of hyperpigmentation over postero-lateral aspect of the elbow joint in one patient, but rest of them had no skin colour changes or any tell tale signs. The palpatory findings were common in all patients with mild local rise of temperature, synovial thickening over the postero-lateral aspect of left elbow and local tenderness. The active range of movement (ROM) was also decreased and painful with mean ROM of $73.75 \pm 4.78^\circ$. Antero-posterior and lateral radiographs of elbow did not revealed any thing significant other than increased soft tissue shadow around the elbow joint. Total leucocyte count, C-reactive protein were raised with negative ANA. The Elbow joint was thereafter aspirated maintaining complete asepsis and around 0.5 to 1 ml of turbid fluid was obtained for sampling. This was sent for direct microscopy and Gram staining as well as for culture and sensitivity, which showed negative results for organism and was exudative in nature. Initial all of them were managed by supervised conservative treatment with nonsteroidal antiinflammatory drugs (NSAIDs), broad spectrum antibiotics and splinting for two weeks, on unsatisfactory response we got a high resolution ultrasonography of the affected elbow which showed minimal effusion and synovial thickening. MRI could not be done due to financial reasons. The patients were then planned for arthrotomy, Intra operative findings revealed hypertrophied synovium (Fig. 1) with thickened capsule and thorn pieces embedded in synovial tissue. Subtotal synovectomy was done and sent for histopathological examination which revealed (Fig. 2) chronic inflammatory synovitis with foreign body granuloma and chronic nonspecific synovitis in two patients each. In three patients single thorn fragment and in one two thorn fragments were recovered from the synovium, closure was done under negative suction. Thorn fragments were found to be of *Acacia arabica* tree. All patients improved after surgery and on subsequent follow-up at 2 months, regained painless near normal range of motion with mean residual flexion deformity of $12.5 \pm 2.86^\circ$.

3. Discussion

Plant thorn induced synovitis of elbow is a rare entity and it may present as chronic relapsing type of synovitis and up to 9 months⁴ symptoms may persist until thorn fragments are removed surgically even total synovectomy may be done to get rid of small remnants of thorn. There may not be proper history of thorn prick^{6,7} as in one of our case did not had history of thorn prick.

Unfortunately the plant thorns are non radio opaque hence cannot be detected radiographically. The aetiology can be determined only on direct exposure of the joint. Histological examination of excised synovium showed the characteristic

Fig. 1 – Excised hypertrophied synovium & recovered thorn fragments.

Fig. 2 – Foreign body granuloma & Non specific synovitis on histopathological examination.

foreign body granuloma with giant cells^{1,2} and common thorn prick injuries are from acacia, rose thorn, cacti, lemon tree etc.^{7–10} In our cases the thorn was of *Acacia arabica*. Ultrasonography of elbow showed hypertrophied synovium with minimal fluid in the joint so definitive diagnosis was made only after arthrotomy. All cases were diagnosed as plant thorn induced synovitis of elbow. Direct inoculation of microorganism by penetrating injuries is one of the cause of non-haematogenous septic arthritis of elbow. Penetrating plant thorn injuries have been associated with a number of bacterial and fungal infections^{8,11} including *Enterobacter agglomerans*, *Sporothrix schenckii* and *Actinomyces* but none of our cases showed evidence of any organism. We achieved satisfactory outcome after surgical intervention^{2,4} with mean residual flexion deformity of $12.5 \pm 2.86^\circ$.

Although ultrasonography is observer dependent but it can also be used to localize the position of the thorn and place a marker on the skin prior to surgical removal. MRI has been used to demonstrate non-radio opaque thorns but there have been no surgically proven cases of plant thorn synovitis where the thorn fragment has been clearly seen on MRI.^{4,8,11,12}

4. Conclusion

The management of plant thorn synovitis of elbow poses a number of diagnostic and treatment challenges and a high

index of suspicion is needed for retained thorn fragments in elbow joint causing synovitis. This case series also provides a useful contribution to its area of research as available literature lacks reporting of plant thorn synovitis of elbow. Surgical intervention is necessary for removal of plant thorn and total or subtotal synovectomy should be performed for satisfactory results. Ultrasonography and MRI can be good diagnostic tool for diagnosis of plant thorn synovitis.

Conflicts of interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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