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**Case Report**

# Adolescent medial epicondyle trash lesion clinic radiological evaluation and treatment

**Navaneeth Ghantasala*, Sitsabesan Chokkalingam, Shibusumanth, Nikhilesh Nair**

Department of Orthopaedic, Sri Ramachandra Institute of Higher Education and Research (SRIHER), Chennai, Tamil Nadu, India

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***Correspondence:**
Dr. Navaneeth Ghantasala,
E-mail: gnithu777@gmail.com



## ABSTRACT

Elbow injures in children accounts for 10% of all fractures, ranges from simple sprain to elbow fracture dislocation. Ligamentous injury accounts for 2-3% only and are mostly sports related seen in overhead athletes. Trash lesions (the radiological appearances seemed harmless) around the elbow are reported in children under 10 years which are high energy trauma with initial normal looking X-rays. These are osteochondral or physical injures presenting with soft tissue swelling without any fractures. A high index of suspicion, early additional imaging such as MRI, CT scan, ultrasound examination and aggressive surgical care are usually necessary for prompt diagnosis and successful treatment of these injuries before complications arise. We presented a case of an elbow injury in a 15 year old girl, following a fall on her outstretched hand with initial normal findings in her X-rays. 3 months following the injury she had persisting pain and instability with ulnar nerve impingement symptoms. Her elbow CT scan, nerve conduction study confirmed the avulsion fracture of medial epicondyle with ulnar nerve neuritis and cubital tunnel syndrome. Valgus stress test proved the extent of additional medial instability. Medial epicondyle avulsion fractures are always challenging for fixation. The retracting UCL forces prevents healing and were prone for failure with non-operative splinting once instability is defined. Attempted fixation can also result in failure of fixation. Our case study highlights the possibility of such trash lesion in adolescent and also the modified technique of ulnar collateral ligament (UCL) reconstruction in a cost effective manner.

**Keywords:** Medial epicondyle trash lesion, Ulnar nerve neuritis, Cubital tunnel syndrome, Elbow instability, UCL reconstruction, Reverse docking, Palmaris longus tendon graft

## INTRODUCTION

Elbow joint has the complex anatomy of articulations between ulnohumeral, radiohumeral and proximal radioulnar joints. In children elbow injures account for 10% of all fractures. The lateral ulnar collateral (LCL) ligament and UCL offers varus and valgus stability respectively.

Trash lesions of elbow as described by Kasser et al were the radiological appearances seemed harmless injures usually reported under 10 years of age.[1] The spectrum of injures included osteochondral injures of medial, lateral condyle, incarcerated medial epicondyle, fracture to radial head and through the unfused distal humeral physis.[1]

The initial X-rays often appears normal.[1,2] The disproportionate degree of swelling and pain should warrant high index of suspicion, further diagnostic tests such as CT scan or MRI of the elbow for early diagnosis prevents unwanted complications.

Intraoperative arthrograms can be useful in ascertaining the size and location of an intra articular fragment. However, as it is done intraoperatively, preoperative planning can be challenging. The parallel study of the plain

radiographs of the opposite uninjured elbow also remains an option. Closely comparing the bilateral elbow radiographs might reveal an abnormal bony fragment or a joint malalignment.[1,2]

Our case study was about an adolescent trash injury of medial epicondyle and its consequences of delayed diagnosis. The modified double loop technique of UCL reconstruction using Palmaris longus (PL) tendon graft and its successful outcome following reverse docking technique had unreported. This technique was very cost effective especially in neglected cases when surgical decompression of ulnar nerve was added.

## CASE REPORT

15 years old girl presented with history of an injury to her right dominant elbow following a fall at her outstretched hand. Initial injury assessment and treatment was done at a local hospital. She had local tenderness over the medial epicondyle with limited range of movements on the extremes. She had normal distal neuro vascular functions. Initial plain X-rays standard antero-posterior and lateral radiograph views were normal except for soft tissue swelling (Figure 1).

**Figure 1: Normal antero-posterior and lateral xrays.**

**Figure 2: Positive valgus stress test.**

***Time line on diagnosis and clinical features***

At 3 months follow up, she had constant pain, poor elbow function, decreased performance but without any limited ROM. In contrast to medial swelling or point tenderness over the site of the ligament attachment, she had the valgus stress test positive at 30, 60 and 90 degrees (Figure 2). At further delay and 6 months from index injury, she had features of cubital tunnel syndrome due to ulnar nerve impingement with dynamic activities especially carrying her school bag. Her worsening symptoms warranted further diagnostic tests.

***Extent of pre-operative investigations***

Repeat X-rays showed the avulsion fracture of the medial epicondyle (Figure 3). CT scan with 3D reconstruction confirmed the avulsion fracture and also the associated opening up of the medial humero-ulnar joint space (Figure 4). Nerve conduction study showed the neuritis picture with features of ulnar nerve impingement at the elbow level.

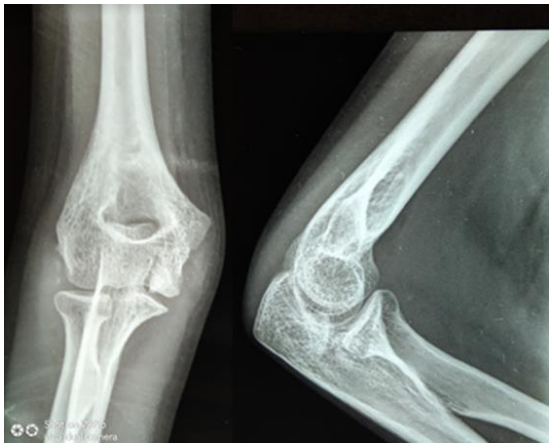

**Figure 3: Repeat x-ray showing avusion fracture of medial epicondyle.**

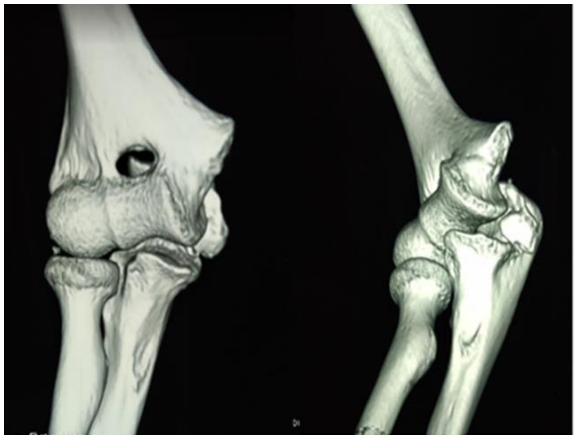

**Figure 4: CT scan confirmed the avulsion fracture of medial epicondyle with opening up of medial humero ulnar joint space.**

***Operative procedure***

Patient in supine position without a tourniquet, through a medial approach exploration and decompression of the ulnar nerve was done (Figure 5). Medial epicondyle fragment was too tiny and hence could not be traced. PL graft harvested from ipsilateral side was double looped to reconstruct the UCL by a modified technique. Standard procedure involved tunneling through the ulna and double docking to the humerus mimicking the natural course of the UCL anterior and posterior bundles. In our case 3 mm PL graft was looped through medial epicondyle (pre drilled with 3.2 drill and burr) near the foot print of UCL attachment (Figure 6). The length of the free limb of the graft needed to properly within the ulnar tunnel was estimated, marked with a pen and a Krakow stich was placed into the free limb of the graft and the free limb was now passed and docked securely in the humeral tunnel Excess graft is removed. Tension was held on the graft while the forearm was maximally supinated with a varus stress on the elbow and the elbow was brought through flexion and extension to eliminate any creep in the graft, similar to an anterior cruciate ligament. Intra operative stability and mobility checked with additional image screening (Figure 7). Cost effective conventional methods were used to secure the graft.

***Follow up and outcome***

Post-operative follow up was done at 2, 6, 12 and 24 weeks. Initial 2 weeks of rest in broad arm sling and between 2-6 weeks elbow ROM exercises were initiated. Out of brace at 6 weeks free ROM and after 12 weeks strength exercises were initiated. She made a full recovery. Post-operative results were satisfactory. Both instability and ulnar nerve symptoms resolved completely.


**Figure 5: Tiny medial epicondyle fragment could not be traced.**

**Figure 6: Palmaris longus graft was looped through medial epicondyle near foot print of UCL attachement.**

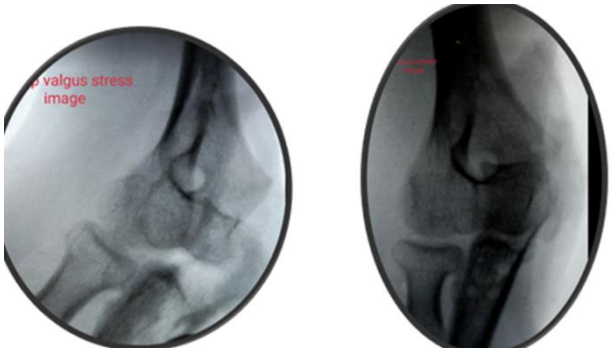


**Figure 7: Pre and Post-operative image screening with valgus stress test.**

## DISCUSSION

Elbow injures in children accounted for 10% of all fractures in their age. Radiographic assessment of most injuries around the pediatric elbow can be challenging due to secondary ossification centers.[1]

Kesser described subset of high energy elbow lesions that were grouped under trash lesions of elbow (the radiological appearances seemed harmless). These were high energy injures with soft tissue finding more than X-rays.[1] Without close careful inspection it was likely to miss findings such as epiphyseal separations, displaced intra-articular medial condylar injures before ossification, capitellar shear fractures, radio-capitellar subluxation, osteochondral fractures of the olecranon and distal humerus joint incongruity.[1,2] The challenge was to have high index of suspicion, early additional imaging (ultrasound, arthrogram, MRI scan) and aggressive

surgical care were usually necessary for prompt diagnosis and successful treatment of these injures.

Anatomically the static valgus stabiliser of the elbow was UCL and dynamic stabiliser being the flexor pronator mass mainly the flexor carpi ulnaris (FCU) then the flexor digitorumsuperficialis (FDS).[3] UCL was composed of 3 bundles anterior, posterior and transverse of which anterior with its anterior and posterior band was the primary crucial restraint to the valgus stability in the range of 0-120 degree of elbow flexion.[3,4]

UCL injury had been reported mainly among the athletes and sports personnel.[4,5] It can be a component of complex elbow dislocation associated with radial head, neck and coronoid fractures. Chronic fatigue and injury pattern was more common than an acute avulsion injury in overhead athletes.[4,5]

Conservative treatment approaches and surgical treatments were analyzed in this systematic review of UCL injures.[5] Conservative treatment included immobilization, PRP injection and physical therapy.[5] Surgical treatment by open ligament repair performed, using different techniques have been reported.[5] Recurrence rate were high with different conservative approaches. Although the results were inconclusive on the basis of the significant difference surgery was indicated in both groups of patients (low-demand and high demand), regardless of the MUCL injury type (sport-related or non-sport-related) when instability persist beyond 3 months of injury.[5]

The first described Jobe's technique for UCLR involved, flexor muscles elevation from medial epicondyle additional submuscular transposition of the ulnar nerve.[1] Drill holes were created in the medial epicondyle and two in the ulna that enabled figure of 8 attachment points of the native UCL. Over 60% of elite baseball pitchers returned back to competitive sports although they reported to have ulnar nerve neuropraxia in up to 21% cases and chronic elbow pain in 85% cases.[6]

The docking plus by McGraw et al combined the docking technique with the figure of 8 method for securing the graft on the humeral side. This method needed special suture loop and drill kit that added up the cost factor.

Other forms of modifications for Jobe's method described in the literature involved usage of interference screw and bioabsorbable pins for docking the graft.

Arthroscopic reconstruction had been reported but open decompression of ulnar nerve for associated compression needs open decompression.

## CONCLUSION

Adolescent elbow injures with significant soft tissue swelling and minimal radiological feature should raise high index of suspicion of underlying injures and escalate appropriate additional investigations for prompt treatment. Neglected medial epicondyle avulsion injury with instability has additional risk of causing ulnar nerve neuritis and cubital tunnel syndrome. Open approach allows decompression of the ulnar nerve in the cubital tunnel in addition to reconstructive stabilization of UCL. The palmaris longus tendon reconstruction with reverse docking in the ulna can be a cost effective alternative in adolescents which could be done using conventional basic ortho surgical instrumentation.

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