Abstract: Anterior elbow dislocation is a rare injury, often associated with soft tissue injury. A 30 yr male admitted with history of accidental fall followed by pain, swelling over his left elbow. Clinically and radiologically, Doppler investigation revealed Anterior Dislocation Of Elbow With Brachial Artery Injury and Posterior Interosseous Nerve Palsy without other bony injury. Immediate closed reduction and primary vascular repair and anastomosis with long saphenous vein graft was done followed by fasciotomy of forearm. Post operatively forearm viability elbow function improved.

Keyword: Anterior elbow dislocation, Brachial Artery Injury, PIN Palsy, primary vascular repair

Introduction
Anterior elbow dislocation is an infrequent lesion, produced by direct trauma to the proximal ulna after a fall on the elbow in flexion, often associated with soft tissue injury. Pain, swelling, deformity are the usual complaints. The arm appears to be shortened. The distal humerus is prominent posteriorly. Because of the dislocation is anterior injury to nerve and vessel can occur frequently. Therefore careful assessment for neurovascular injury mandatory. Reduction achieved by closed reduction under anaesthesia followed by elbow is immobilised less than in 90 degree flexion. After reduction carefully assess for neurovascular injury, if its present it should be addressed

Case History
A 30 yr male brought to the trauma ward with history of accidental fall followed by stampede over his flexed left elbow with c/o pain, swelling over his left elbow and inability to use the left upper limb.

Clinical Findings
Elbow was in 30 degree flexed attitude and forearm in supinated position. A depression was present on post aspect of forearm (fig.1) & olecranon prominence was lost. There was swelling and blisters over the left forearm and arm was tense. Three point bony relationship was altered. Stretch pain was present. Radial pulse was not palpable, but capillary filling was normal. Finger drop was present and there was no wrist drop.

1. Clinical photograph
2. X-ray
   x-ray shows anterior dislocation of elbow, without other fractures (fig.2) Hand doppler revealed Brachial artery and ulnar artery was not recordable, Radial artery feeble.

Diagnosis:
Left elbow anterior dislocation with Posterior Interosseous nerve palsy and Brachial artery injury with impending compartment syndrome

Treatment:
Closed Reduction Under GA:
Gentle traction along the deformity was given, followed by flexion of elbow and posterior displacement of forearm. Reduction was achieved with some difficulty. Range of movements were checked & elbow was found to be stable in all ranges. After reduction radial pulse was not palpable and capillary refilling was present. Elbow was explored anteriorly by vascular surgeon and brachial artery was found to be lacerated above the level of bifurcation (fig.3, 4). Lacerated part of the brachial artery was removed & the defect was bridged with anastomosis using Long saphenous vein graft.
For the impending compartment syndrome, fasciotomy of all compartments of forearm was done.

3. Complete tear of brachial artery

4. Lacerated ends of brachial artery

5. Long saphenous vein graft harvested from opposite side leg.

6. Placement of graft and anastomosis was done over ends

7. LSV graft final position

8. Procedure completed with fasciotomy of forearm

9. After wound closure, fasciotomy wound was left opened. Post reduction x-ray showed a congruent elbow joint (fig. 10, 11). Post reduction CT scan of elbow showed maintainance of articular congruity and no other bony injury (fig. 12, 13, 14)

10. Post reduction x-ray AP view

11. Lateral view

12. Post reduction CT scan

13. Post reduction CT scan

An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Surgery and Surgical Specialties
14. Post reduction CT scan
Post operative follow up:
The limb was immobilized with Above elbow slab and elbow in less than 90 degrees flexion and forearm in midprone position(fig15) . Split Skin Grafting was done for fasciotomy wound after a week(fig 16) and limb was immobilized for three weeks. Active mobilisation was started after removing slab.

15. Post operative immobilisation

16. Split Skin Grafting was done for fasciotomy wound

17. Left elbow full extension

18. Elbow flexion
After 2 months of follow up - left elbow full extension was achieved. And flexion upto 100 degrees (Fig 17, 18).Supination 80 degrees and pronation 70 degrees

Discussion
The elbow joint is the second most commonly dislocated joint in adults. The annual incidence of simple and complex elbow dislocations in children and adults is 6.1 per 100,000[1]. Elbow dislocations are classified as simple or complex types [2]. The simple dislocation is characterised by the absence of fractures, while the complex dislocation is associated with fractures. Nearly all the dislocations are of the posterior or posterolateral types. In Conn’s study, 96% of the dislocations were posterior or lateral [3] and Joseffson’s reported no anterior dislocations in his study of 52 patients [4]. In 58% of patients, the simple elbow dislocations were on the nondominant side[4].

An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Surgery and Surgical Specialties
In 1965 Linscheid and Wheeler(15) reported a series of over 110 elbow dislocations in which there were six cases of concomitant arterial injury. They treated three by observation alone, two by ligation of the brachial artery and one by a direct repair which throbosed. At follow-up, allpatients with vascular injury were noted to have a viable limb, but one had an ischaemic contracture of the hand and all had residual neurological loss(15). This led later authors to conclude that an aggressive approach to arterial injuries associated with elbow dislocation probably was warranted(16).

Soon after, in 1966 Aufanc, Jones and Turner(17) described the use of a vein graft to treat a similar injury. Whilst there is some continuing debate, this has remained the most common treatment(13,16,19). In view of the rich collateral circulation around the elbow, some authors initially advocated ligation of the brachial artery after injury to increase the pressure in the collateral circulation(14). This was said to lead to return of the radial arterial pulse in some cases. However, other authors noted complications of cold intolerance and intermittent claudication of the forearm and hand(8,13). Observation alone has been reported in cases of pulseless, but viable hands(19). Currently, reconstitution of flow to the brachial artery is the most popular choice(16,20).

A index of suspicion for vascular injury is warranted following any dislocation of the elbow, especially with a high-energy or open injury, neurological compromise (especially median nerve palsy) or extensive swelling at the elbow(21). Absolute surgical indications include signs of vascular insufficiency or compartment syndrome. Although controversial, repair or vein grafting after thrombosis of the brachial artery may prevent cold intolerance or claudication of the forearm(20). Fasciotomy should be performed if there are signs of a compartment syndrome or when there is a prolonged ischaemia (16)

In our case, while there was clinically evident arterial insufficiency, there was clinical evidence of compartment syndrome. Because of this primary brachial artery repair and anastomosis with Long Saphenous Vein graft and fasciotomy of the forearm and hand was performed.

Conclusion
This case presented for rarity of anterior elbow dislocation and increased incidence of complications, such as brachial artery disruption and associated fractures. When plaster immobilisation is preferred to treat simple elbow dislocations one has to realise that immobilisation of more than 14 days may be associated with stiffness.

BIBLIOGRAPHY

An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Surgery and Surgical Specialities