

DISAPPEARING PULSE HAND - A RARE CLINICAL SCENARIO

ABSTRACT

INTRODUCTION & AIMS OF THE STUDY - Disappearing pulse hand is a clinical condition where-in the pulse is present pre-operatively but disappears till the patient is taken in the Operating room(OR) or following Closed reduction and Pinning. This type of clinical scenario is most commonly seen with Gartland type 3 severely displaced supracondylar humerus fracture with sharp anteromedial spike with Large Hematoma and bruise. We present a cohort of 10 cases in which the pulse disappeared and there was poor perfusion of the limb Post-reduction and Pinning. This type of case scenario is rather rare but the fact that there is a certain cohort of cases that exists, we should have heightened sensitivity and have a low threshold for exploration.

METHOD - A cohort of 10 cases of Gartland type 3 supracondylar humerus fracture (Posterolateral variety) in which pulse disappeared Post-reduction and Pinning were selected. Exploration was done using a mini-open approach with a transverse incision over the cubital fossa and the decompression was achieved with blunt soft tissue dissection.

RESULTS - All Patients showed good radiological and clinical outcomes. Pulse returned immediately post-decompression and hand was well perfused. No Complications Noted.

CONCLUSION - In Gartland type 3 supracondylar humerus fracture with posterolateral variety with large hematoma, always have heightened sensitivity for disappearing pulse hand and keep a low threshold for exploration & decompression by blunt dissection.

KEYWORDS - Disappearing pulse hand, pink pulseless hand, supracondylar humerus fracture.

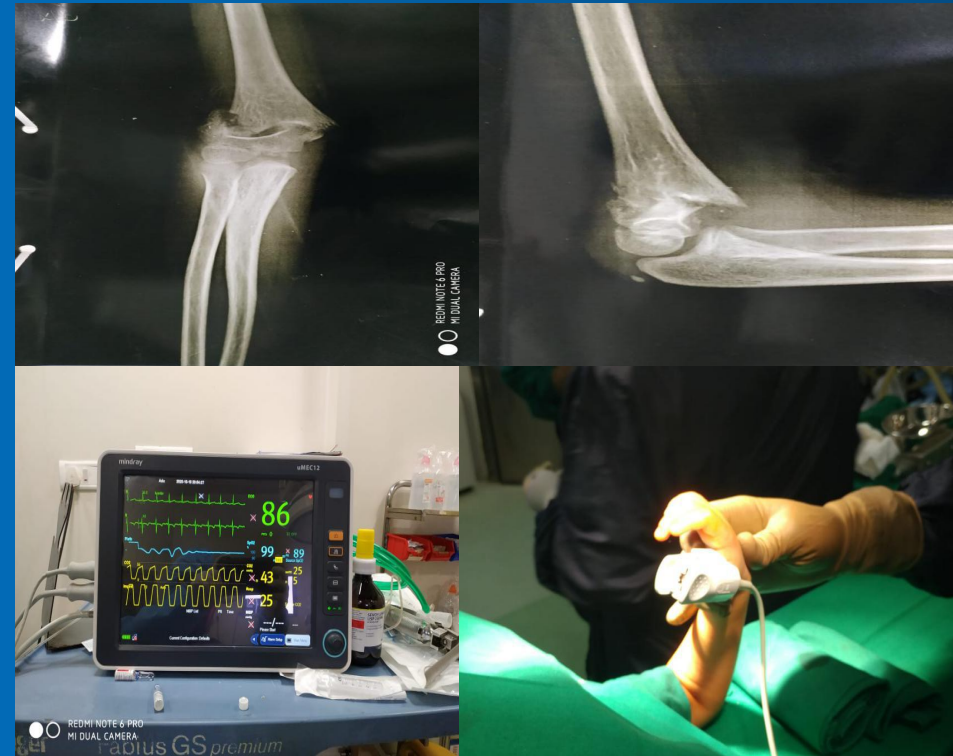


INTRODUCTION

- The incidence of vascular injuries associated with displaced supracondylar fractures of the humerus in children is about 10-20%.^{1,2,3} It is reported to be more common in extension type fractures due to the proximity of the proximal fragment to the neurovascular bundle.^{4,5}
- Disappearing pulse hand is a clinical scenario where-in the pulse is present pre-operatively but disappears till the patient is taken in the Operating room(OR) or following Closed reduction and Pinning. This type of clinical scenario is most commonly seen with Gartland type 3 severely displaced supracondylar humerus fracture with a sharp anteromedial spike with Large Hematoma and bruise.
- A Tremendous amount of studies have been done and there are numerous research articles on the management of pink pulseless hand and thereby no confusion regarding the management of pink pulseless hand.
- However, no consensus on the management of those limbs, where-in the pulse is present pre-operatively but disappears till the patient is taken in the Operating room(OR) or following Closed reduction and Pinning (DISAPPEARING PULSE HAND). The management options include either observation or exploration which are the two extremes of the spectrum.
- The purpose of the study is to highlight the new entity “DISAPPEARING PULSE HAND” and to establish that this type of case scenario is rather rare but the fact that there is a certain cohort of cases that exists, we should have heightened sensitivity and have a low threshold for exploration.

METHODOLOGY

After obtaining approval from the Institutional Review Board, We present a cohort of 10 cases of Gartland type 3 severely displaced supracondylar humerus fracture with a sharp anteromedial spike with large hematoma and bruise seen over for 5 years which had pulse pre-operatively, but the pulse disappeared till the patient was taken to the operating room or post-reduction and pinning. Also, the limb was poorly perfused.



In this study, we took the waveform of the pulse oximeter to assess the perfusion status of the limb which is simple, reliable, objective, easily available in every theatre.

Among the 10 cases, in 9 cases the pulse disappeared post reduction and pinning and in 1 case pulse disappeared even before attempting reduction. There was a distinctive soft endpoint to the fracture reduction.

Post-Reduction and pinning, Pulse disappeared and pulse oximeter showed poor/no waveform. Following this, exploration was planned. The exploration was done using a mini-open approach with a transverse incision centered over cubital fossa and soft tissues were released from the fracture site with blunt dissection and Pulse regained immediately which was felt clinically and confirmed on Pulse oximeter waveform. Postoperatively, the limb was kept in a long arm slab.

RESULTS

- The mean age was 6 years (5-10years). Of the 10 cases, 6 were male and 4 female. All the patients had a well-perfused hand with a palpable pulse at the initial presentation with a Gartland type 3 supracondylar humerus fracture. Local examination of the elbow showed a grossly large amount of hematoma and bruise on the anterior aspect of the elbow. The dominant arm was involved in 70% of the cases. There was no concomitant injury of the anterior interosseous nerve (AIN).
- Postoperatively, all the cases showed a near anatomical reduction and this was maintained even during K-wire removal. Also, the pulse was regained immediately post-exploration and decompression which was confirmed objectively with the waveform of the pulse oximeter & Doppler Post-operatively.
- All the fractures united within 6 weeks, K-wire removed at 6 weeks and mobilization was started. Full ROM was achieved in almost all cases within 12 weeks.
- No complications were noted during the entire study like compartment syndrome, elbow stiffness, myositis ossificans.
- During the final Followup, all the patients were pain free, normal pulse, good range of motion, and no neurological deficit.

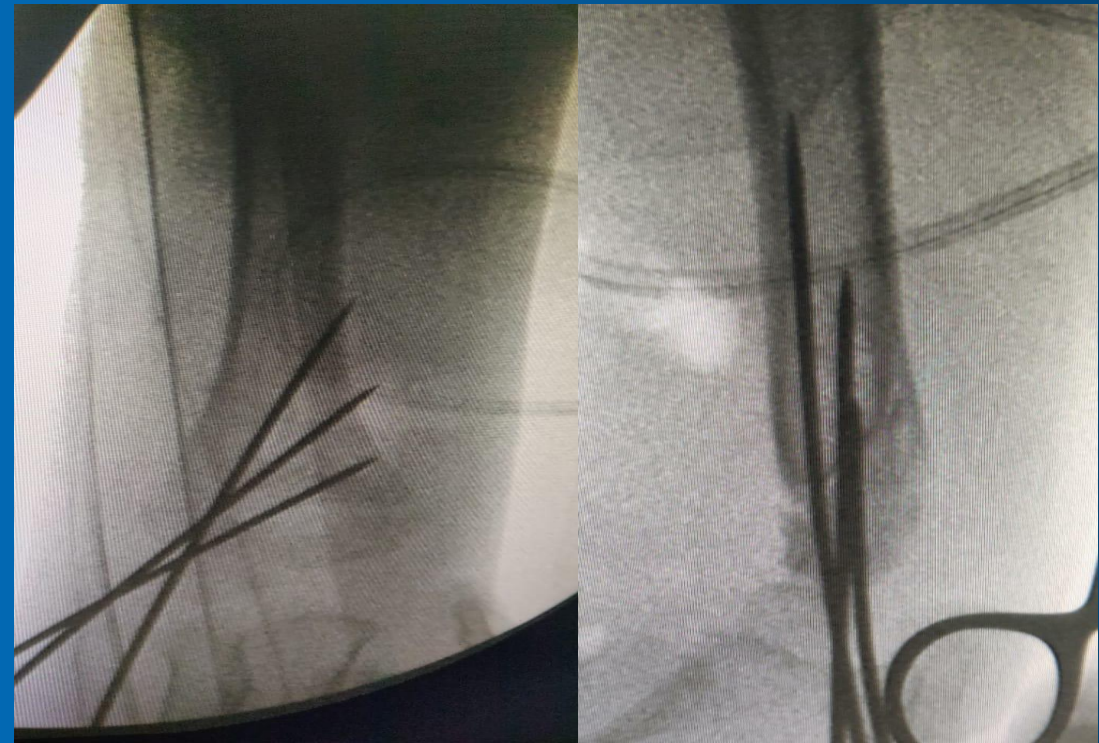


DISCUSSION

- Neurovascular complications most frequently occur with Gartland type III extension supracondylar fractures.⁶
- Extensive research and study have been done and there is an enormous amount of literature on management guidelines of pink pulseless hand however there is currently no consensus regarding the management of Disappearing pulse hand. There is not a single article in the literature that mentions this type of clinical scenario.
- There was always a distinctive soft endpoint to the fracture reduction indicating that there is soft tissue interposition between the fracture fragments which has impaled the vessels and thereby jeopardizing the vascularity of the entire limb. Hence we did not wait to observe but immediately explored.
- The exploration requires just a small mini-open incision centered over the fracture and releasing the soft tissues from fracture site using blunt dissection and immediately the pulse was regained in all the cases. Hence there was no need for a vascular surgeon
- The operating room should be kept ready for exploration along with fixation material when you see a fracture like this and should have heightened sensitivity
- No complications were seen during the 1 year follow-up period. No compartment syndrome, no stiffness, no contractures.
- The purpose of the study is to highlight this new entity “Disappearing pulse hand” and create awareness about such a clinical scenario that may arise and thereby formulate management guidelines.

CONCLUSION

So to conclude, we are describing a new entity "Disappearing pulse hand" where-in the pulse is present pre-operatively but disappears till the patient is taken in the Operating room(OR) or following Closed reduction and Pinning, which is a rare clinical scenario seen most commonly with severely displaced Gartland type 3 fractures with anteromedial spike unlike pink pulseless hand, but since a cohort of cases exists, always have heightened sensitivity and keep a low threshold for exploration & decompression.



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