

A rare cause of open acute compartment syndrome of forearm following stab injury

Dash Suvashis*, M Rahul and Lukesh P

Department of Burn, Plastic and Maxillofacial surgery, Vardhaman Mahaveer Medical College and Safdarjung Hospital, India

Abstract

Background: Acute compartment syndrome is caused by increased compartment pressure usually in a closed compartment. Most cases are caused by blunt force or fractures. It leads to increased compartmental pressure. Stab injury as a cause of acute compartment syndrome is a rare condition. In this condition the compartment is not fully closed but there is increased intracompartment pressure, which leads to vascular compromise. Pathological changes occur in tissue and can have a catastrophic result, even limb loss.

Method: It is a case report of single case study operated in our center. We are reporting a case of acute compartment syndrome of forearm following stab injury.

Results: On time diagnosis and appropriate surgical management leads to satisfactory outcome and limb salvage.

Conclusions: This condition if not treated in time leads to catastrophic result such as limb or life loss. High index of clinical judgment and apt treatment on time is crucial for limb salvage.

Introduction

Acute compartment syndrome occurs when interstitial pressure increases in osseofascial compartment. This leads to decreased capillary perfusion and micro vascular compromise. Most common cause of acute compartment syndrome is fracture. Pain and parasthesia are the early clinical feature to be seen [1].

Case report

A 30 years old gentleman presented to casualty with stab wound over left forearm. He was conscious and alert. His pulse was 90/min; blood pressure was 130/84 mm hg, no pallor. There was no external bleeding from wound. On examination of patient there was a stab wound over postero medial surface of the left forearm of size approximately 3x2 cm (Figures 1 and 2). The patients complained of intense pain in the whole of forearm. The left forearm was cold. The forearm was tense, tender. On moving the fingers, the pain exacerbates. Radial pulse was feeble while ulnar pulse was absent. The patient complained of tingling sensation of 2nd, 3rd, 4th and 5th fingers. Capillary refill was delayed.

A USG Doppler of hand was done and it showed normal flow in brachial artery till division in to ulnar and radial artery. Flow in radial artery is normal in proximal half of forearm, the distal part of radial artery showed monophasic flow. With peak systolic velocity of 15 cm/sec. Ulnar artery flow was normal until it enters intramuscular plane when there was an ill-defined heterochoic lesion which was compressing the ulnar artery distal to the lesion no flow is detected in ulnar artery was nearly collapsed. An x ray of left upper limb shows no bony injuries.

The patient has no history of chronic illness. He was not on any anticoagulants. No known allergy. No recent history of IV injection in the right forearm or blunt trauma.

Adequate analgesia was given to the patient. Fasciotomy was done on the flexor aspect of the forearm under general anesthesia. On



Figure 1. Stab wound over postero medial surface of the left forearm of size approximately 3x2 cm

***Correspondence to:** Dash Suvashis, M.S., Senior Resident, Department of Burn, Plastic and maxillofacial surgery vardhaman mahaveer medical college and safdarjung hospital, H 2 first floor, Green Park main New Delhi -110016, India, Tel: +919999082897; Email: suvashis.dash@gmail.com

Key words: stab injury; forearm compartment syndrome; acute compartment syndrome; fasciotomy

Received: May 20, 2018; **Accepted:** May 26, 2018; **Published:** May 31, 2018

fasciotomy the muscles bulge out. A large hematoma was found, which evacuated (Figure 3). The ulnar artery was searched along the visible length found to be intact, pulsating normally. Hemostasis was done for the small bleeders. Wound was left open moist dressing was done. Split skin grafting was done in 1 week later for coverage. There limb function was normal in follow up.

Discussion

The pathophysiology of acute compartment syndrome starts when the intracompartment pressure increases than that of the end capillary pressure. This impedes the venous return [1]. The early symptoms are pain and paresthesia. When the intracompartmental pressure further increases the arterial flow gets compromised. Decreased blood flow leads to tissue hypoxia and further accentuates the problem. If this condition is not treated on time it can cause limb loss [1,2]. Acute compartment syndrome of forearm mostly seen following fracture or crush injury of forearm. Acute compartment syndrome due to stab injury to forearm is a rare condition [3]. Penetrating injury usually doesn't present as acute compartment syndrome. Morin in his article described a case of ACS of forearm following stab injury. He described



Figure 2. Stab wound over postero medial surface of the left forearm of size approximately 3x2 cm

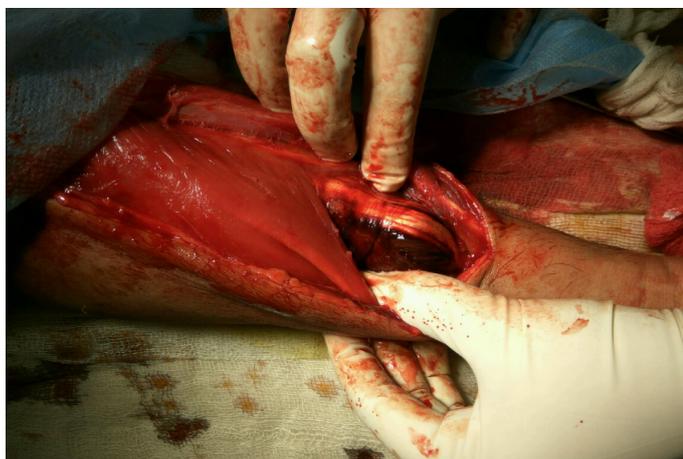


Figure 3. Large hematoma

5 cases of penetrating injury presenting as ACS. One is a stab injury other 4 are gunshot injury. The gunshot wounds are being high energy trauma leading to more damage can presents as ACS. ACS following stab injury has less surrounding tissue injury [4].

In the literature various causes of ACS described. Although fractures are being most common other uncommon causes are extravasations of IV drugs (mannitol, dextrose, nonepinephrine) and contrast agents, percutaneous radial artery intervention, veinipuncture [5-7]. Some case of spontaneous ACS is also seen in patient on anticoagulant therapy or with coagulation disorders like hemophilia [8]. Our patient has no history of coagulative disorder or on anticoagulant therapy [9]. Gildoy in his article presented a case of stab wound to thigh which was treated with fasciotomy and recovered following treatment [10]. ACS is a clinical diagnosis. We have operated the patient basing on clinical diagnosis. Morin in his article reported that in all the case of penetrating injury a named vessel was injured. But in our case no named vessels was found to be injured, which was different from earlier reports [4]. ACS although occur commonly following blunt trauma and fractures, it may occur following stab injury with or without injury to major vascular structures. A through clinical approach is needed for its management to prevent limb loss.

Conclusion

This is a rare cause of compartment syndrome following stab injury to forearm. The ACS can present even after stab injury without any major vascular injury. It is very important for the surgeon to have high degree of clinical suspicion and early surgical management to prevent any catastrophic result.

Conflict of interest

None.

References

- Hargens AR, Mubarak SJ (1998) Current concepts in the pathophysiology, evaluation, and diagnosis of compartment syndrome. *Hand Clin* 14: 371-383. [[Crossref](#)]
- Green DP, Hotchkiss RN, Pederson WC, Wolfe SW (2008) Operative Hand Surgery. 5th ed. New York: Elsevier, Churchill Livingstone; Ayan Gulgonen: Compartment syndrome.
- Botte MJ, Gelberman RH (1998) Acute compartment syndrome of the forearm. *Hand Clin* 14: 391-403. [[Crossref](#)]
- Morin RJ, Swan KG, Tan V (2009) Acute forearm compartment syndrome secondary to local arterial injury after penetrating trauma. *J Trauma* 66: 989-993. [[Crossref](#)]
- Eroglu A, Uzunlar H (2004) Forearm compartment syndrome after intravenous mannitol extravasation in a carbosulfan poisoning patient. *J Toxicol Clin Toxicol* 42: 649-652. [[Crossref](#)]
- Grand A, Yeager B, Wollstein R (2008) Compartment syndrome presenting as ischemia following extravasation of contrast material. *Can J Plast Surg* 16: 173-174. [[Crossref](#)]
- Nixon RG, Brindley GW (1989) Hemophilia presenting as compartment syndrome in the arm following venipuncture: a case report and review of the literature. *Clin Orthop Relat Res* 244: 176-181. [[Crossref](#)]
- Zimmerman DC, Kapoor T, Elfond M, et al. (2013) Spontaneous compartment syndrome of the upper arm in a patient receiving anticoagulation therapy. *J Emerg Med* 44: e53-6. [[Crossref](#)]
- Kim J, Zelken J, Sacks JM (2013) Spontaneous Forearm Compartment Syndrome in a Boy with Hemophilia A: A Therapeutic Dilemma. *ePlasty* 1:13. [[Crossref](#)]
- Gillooly JJ, Hacker A, Patel V (2007) Compartment syndrome as a complication of a stab wound to the thigh: a case report and review of the literature. *Emerg Med J* 24: 780-781. [[Crossref](#)]

Copyright: ©2018 Harrison R. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.