

Acute Compartment Syndrome Of The Upper Arm

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Abstract

Acute compartment syndrome of lower limb and forearm is quite well-known pathology. However its occurrence in upper arm is very rare and only a few cases have been described in medical literature. We want to share our experience of managing this condition especially in semiconscious or obtunded patient after heavy binge drinking. High suspicion should be considered due to reduced response to pain because of impaired conscious level.

INTRODUCTION

Compartment syndrome occurs when pressure within a closed muscle compartment exceeds the perfusion pressure and results in muscle and nerve ischemia. The report of compartment syndromes of upper arm is conspicuously rare in medical literature¹. The causes in arm are trauma, burns, infection, Fracture neck of Humerus, Triceps avulsion, and steroid use in athletes, thrombolytic therapy and prolonged pressure on the arm during sleep or unconsciousness as a result of alcohol or other drugs^{2, 3}. We wish to report our experience with an upper arm compartment syndrome.

CASE REPORT

54 year old gentleman presented to us with pain and marked swelling in his left upper arm. He was found in semi-conscious state in his house after a heavy binge drinking over night. The past history included the hypertension and depression. The vital signs were normal with GCS of 14/15. There was no other injury. The pulses in left arm were palpable. The active flexion was restricted to 45 degrees and pain intensified on passive flexion which was limited to 90 degrees. Sensory examination was not possible because of conscious level. The compartment pressure in the arm was measured immediately which was 32 mmHg. It was repeated after 1 hour and was raised to 49 mm Hg. The blood showed W.B.C of 27.1, urea 7.3mmol/l, creatinine 323umol/l, K 6.9 meq/l, GGT 58 u/l and creatinine kinase (C.K) of 61000u/l (normal 10-186 u/l). The diagnosis of upper arm compartment syndrome was made. It was also obvious that the patient had rhabdomyolysis resulting into acute renal failure as he became oliguric. The immediate fasciotomy of arm was done extending from axilla arcing over the biceps

down to extensor compartment of the arm (Fig 1 and 2).

Figure 1

Figure 1: Surgical incision for decompression of upper arm compartment



Figure 2

Figure 2: Surgical incision extending to forearm for decompression



There was no obvious muscle necrosis. The patient underwent haemodialysis. Further wound debridements were done for late my necrosis and wound was closed on 10th day after admission. The patient was discharged after 4 weeks when renal function became normal. He was put into extensive rehabilitation and physiotherapy of the arm.

By 13 weeks postoperative, the patient had regained full range of motion of the elbow and follow-up x-rays showed no signs of myositis ossificans. Strength at 6 month follow-up as normal.

DISCUSSION

The upper arm has two compartments-the extensor (triceps) compartment and the flexor (biceps) compartment. The arm has fewer rigid and broad ligaments and tendons than the leg or forearm, and the brachial fascia tends to yield more and, therefore, has a greater capacity for swelling prior to pressure increase within the compartment¹. When these critical level are reached a true compartment syndrome can occur. The clinical signs and symptoms of compartment syndrome are pain out of proportion to clinical situation, a palpably tense compartment, pain with passive muscle stretch, paresis and paresthesia³.

The muscles were noted to have functional impairment after 2 to 4 hours and of ischemia and irreversible functional loss after 4 to 12 hours. Nerves have found to show abnormal function after 30 minutes of ischemia with irreversible

functional loss after 12 to 24 hours^{4, 5}. Rhabdomyolysis and subsequent renal failure are among the most severe complications as a result of muscle necrosis. Rising serial CK measurements are indicative of a rhabdomyolysis due to developing Compartment syndrome⁶. Muscle has considerable ability to regenerate by forming new muscle cells. Therefore, it is extremely important to decompress ischemic muscle as early as possible. In medical literature Fasciotomy has been proposed when compartment pressure rises within 10 to 30 mmHg of diastolic pressure^{6, 7}. If the compartment pressure is more than 40 mm Hg, a fasciotomy is usually performed emergently.

Higher index of suspicion for the diagnosis should be considered in patients with acute spontaneous arm swelling who are obtunded or unconscious like drug addicts, alcoholics and patients in ITU⁸. We stress on the early diagnosis of condition with appropriate history and clinical examination and a low threshold for surgical exploration and fasciotomy as it is associated with good outcome and functional recovery.

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References

1. Leguitt P. Compartment syndrome of the upper arm. *Neth J Surg* 1982;34:123-126
2. Palumbo R, Abrams J. Compartment syndrome of the upper arm. *Orthopaedics* 1994;17:1144-1147
3. Ridings P, Gault D. Compartment syndrome of arm. *JHand Surg(Br)* 1994;19B:147-148
4. Matsen FA, Inquest RA, Krugmire RB. Diagnosis and management of compartment syndromes. *J Bone Joint Surg* 1980;62A:286-291.
5. Whitesides T, Heckman M. Acute compartment syndrome: update on diagnosis and treatment. *J AAOS* 1996;4:209-218
6. Mubarak S J, Hargens A R. Acute compartment syndromes. *Surg Clin North Am* 1983;63(3):539-65
7. Whiteside T E, Haney T C, Morimoto K, Harada H. Tissue pressure measurements as determinant for the need of fasciotomy. *Clin Orth* 1975;113:43-51
8. Scott E Cameron. Acute compartment syndrome of the triceps. *Acta Orthop Scand* 1993;64 (1) 107-108

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