International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Case Report

Management of Acute Compartment Syndrome of Leg Secondary to Ruptured Baker's Cyst by Aspiration of Knee Joint

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ABSTRACT

Compartment syndrome in the leg is usually treated by emergency fasciotomy. We present a case of a 57 year old man who presented with signs of acute compartment syndrome of leg secondary to a ruptured Baker's Cyst. This was managed with aspiration of his knee joint. Following this the pain and neurology in the entire leg improved, calf was no longer tense. This case demonstrates that compartment syndrome caused by ruptured Bakers cyst can be treated by a simple percutaneous needle aspiration of the knee joint.

Keywords: Compartment syndrome, ruptured Baker's cyst, aspiration, knee joint

INTRODUCTION

Acute compartment Syndrome is an emergency and it is treated usually with emergency fasciotomy to save the limb. Ruptured Bakers cyst can present as acute compartment syndrome of leg. However, in this case the patient was not treated by fasciotomy; rather he had aspiration of ruptured Baker's cyst through the knee joint and recovered remarkably. This treatment method for compartment syndrome is rather new, quick, safe and not widely published in literature. This treatment modality saved the patient the risks and complications associated with open fasciotomy and were very effective in leading to rapid recovery of pain and previously reduced sensory function. However when this does not work, fasciotomy is still available.

CASE PRESENTATION

A 57 year old man presented to his GP with complaints of sudden onset right calf swelling and severe pain, numbness in the toes and the sensation of stinging nettles in the back of the right calf. Clinical examination revealed an increased circumference around the right calf 37cm (and 34cm at same level on the left), and marked tenderness over the calf with inability to bear weight. He was immediately referred by his GP to A&E department due to suspicion of acute compartment syndrome. He had right knee and calf pain which had started couple of days earlier. Pain was initially mild, progressively got worse and became unbearable on the morning of the day he presented (about 12 hours earlier), making him unable to bear weight. Hence he had been limping all day. There was no preceding history of trauma. He was known to have Hypertension, High Cholesterol and Baker's Cyst in his right knee. His routine medications were Ramipril and a Statin. He had a significant smoking history.

Physical Examination Findings:

Key findings on examination was a large effusion in his right knee joint which was also very tense with reduced range of motion. The right leg was swollen with a tense right swollen calf, markedly tender over the posterior compartment. The right foot and ankle were slightly cold with pulse present and normal capillary refill. Sensation was uniformly reduced (6/10) below the knee. He was able to actively dorsiflex and planterflex his ankle and foot but with a lot of pain. The above presentation was in keeping with a diagnosis of ruptured Baker's Cyst causing right leg acute compartment syndrome

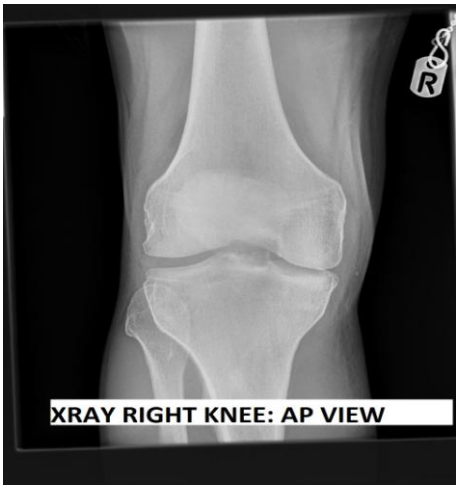

Figure 1

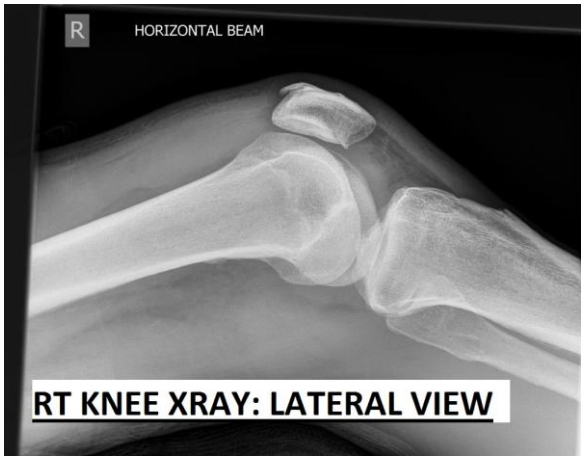

Figure 2

Investigation Results

Full blood count showed elevated white cell count (19.75 x 10^9/l, Neutrophils 15.6 x 10^9/L). Other blood tests were normal: C-reactive Protein 3, D dimmers 0.14mg/L (normal <0.15), Sodium 130mmol/L, Potassium 4.6mmol/L, Creatinine 94mmol/L, Creatine Kinase 121 units/L (normal 40-320). Right Knee X-ray showed moderate degenerative changes.

At this stage he needed an urgent decompression of his calf and leg to relieve the compartment syndrome. As he had a large knee effusion, a decision to aspirate the knee joint was made.

Under aseptic conditions, 160mls of haemorrhagic fluid was aspirated from the right knee joint.

Right knee aspirate was heavily blood stained, had no birefringent crystals, no organisms seen on gram stain and no growth after 48 hours culture.

Soon after aspiration, patient noted that the pain in the right leg had reduced significantly, full range of motion restored to the knee with better and easier movement of the foot and ankle joint. The foot gradually became warm and dorsalis pedis pulse volume improved. Sensation in the entire leg improved to 9/10 (from 6/10) and in the foot to 10/10 (from 6/10 pre-aspiration). Calf felt less tense compared to pre- aspiration.

He was seen the following day and pain had resolved and sensation was entirely back to normal.. He was discharged and advised to rest for 2 to 3 days, elevate the limb most of that period and take analgesics if he had pain. If pain became serious again, he was to return for further review.

DISCUSSION

Compartment Syndrome is a condition in which the pressure within a fixed fascial compartment is raised sufficiently to result in tissue ischaemia and subsequent neuromuscular compromise. [1] There are 2 main types of compartment syndrome: Acute compartment syndrome (ACS) which usually occurs within a short time and needs emergency measures to correct; most often due to trauma and Chronic Compartment syndrome which is of gradual onset, usually after repetitive

exercise and is relieved by stopping the activity. [1,2]

The most common site of Acute Compartment Syndrome is the leg, followed by the forearm, arm, thigh, foot, gluteal region and hand. [3] In the index case reported, it occurred on the leg. ACS occurs very often in the setting of fracture. It could also be caused by tight plaster cast, tight bandage (applied before limb has stopped swelling), circumferential burns and procedures to revascularize blocked blood vessels. [2, 3] Rarer causes of ACS include Nephrotic Syndrome, Viral Myositis, Hypothyroidism, malignancies, bleeding disorders and Diabetes Mellitus. [3] Ruptured Baker's cyst is an extremely rare cause of ACS. [3,4-6]

Clinical features of ACS include pain that is out of proportion, paraesthesia, pain on passive stretch of muscles in the compartment, pallor, paralysis and pulselessness (which is a late sign). [3] There may be tenderness in the affected area and tightness in the muscle [2] as noted in this patient. Diagnosis is largely clinical though measurement of Intra-compartmental pressure is a very useful adjunct especially when findings are not clear. [1]

Treatment of ACS is usually by emergency fasciotomy in the affected compartment in the setting of trauma and in other non-traumatic settings like ruptured Baker's cyst and revascularization procedures. [3, 5]

This particular case is worthy of reporting as the patient did not have fasciotomy. He instead had aspiration of 160mls of haemorrhagic fluid from the posterior compartment of the knee (as well as the popliteal fossa) through the knee joint. He made dramatic improvement in symptoms. Examination findings corroborated the improvement within hours of the aspiration as the posterior compartment was not longer tense, and paraesthesia in the leg and foot improved such that he was discharged the following day. Note that this option was done having in mind the possibility of needing to take him to the theatre for a formal fasciotomy if he had not made significant clinical improvement but by the following day, it was clear that this improvement was sustained and there was no need to do fasciotomy hence he was discharged.

CONCLUSION

Acute Compartment Syndrome is an emergency and it is treated usually with emergency fasciotomy to save the limb. Ruptured Bakers cyst can present as Acute Compartment Syndrome. Aspiration of knee joint to decompress the Bakers cyst is a novel treatment that is quick and safe. If it does not work the option of fasciotomy is still available.

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How to cite this article: Briggs P, Das Y. Management of acute compartment syndrome of leg secondary to ruptured Baker's cyst by aspiration of knee joint. Int J Health Sci Res. 2019; 9(11):147-149.

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