Sudden onset of calf pain

小腿突然的痛楚

LTH Tan 陳傳興 and KL Ong 王金蓮

Avulsion of the myo-tendinous junction of the medial head of the gastrocnemius muscle is commonly associated with strenuous physical activities such as racquet sports, skiing, and running. The injury is painful, distressing and can be disabling. Ready availability makes ultrasound study the imaging modality of choice in the emergency department. (*Hong Kong j.emerg.med.* 2006;13:111-112)

腓腸肌內側頭的肌腱接合點撕脫常與激烈的體育活動有關，例如短網拍式球類運動、滑雪和賽跑。這創傷會令人痛苦、苦惱及可致殘廢。因其使用方便，超聲波檢查已成為急症室所挑選的造像方法。

Keywords: Athletic injuries, gastrocnemius, skeletal muscle, tendon injuries, ultrasonography

關鍵詞：運動創傷、腓腸肌、骨骼肌，腱創傷、超聲波造影術

Case summary

A 38-year-old gentleman suddenly experienced severe pain on the back of the right leg while playing tennis in October 2005. The pain was localised to the medial aspect of his right calf. There was mild swelling but no associated bruising. A similar incident occurred some months ago on the left calf following a vigorous game of tennis. Ultrasound examination revealed a small fusiform anechoic fluid collection on the right calf and a smaller fusiform medium echogenicity between the disrupted medial head of the left gastrocnemius and the aponeurosis of the left soleus (Figures 1 & 2).

Correspondence to:
Ong Kim Lian, MBBS, FRCSEd, FHKAM(Emergency Medicine)
Tuen Mun Hospital, Accident & Emergency Department, Tsing Chung Koon Road, Tuen Mun, N.T., Hong Kong
Email: ongkl@ha.org.hk

Precious Blood Hospital, Department of Radiology, 113 Castle Peak Road, Sham Shui Po, Kowloon, Hong Kong
Tan Thuan Heng, Lawrence, MBBS, FRCR, FHKAM(Radiology)

Discussion

Avulsion of the myo-tendinous junction (muscle-aponeurosis) of the medial head of the gastrocnemius muscle is more commonly referred to as 'tennis leg'. The injury is commonly associated with strenuous physical activities such as racquet sports, skiing, and running. It is often found in patients between the ages of 30 to 45 years.[1]

This calf injury occurs when there is quick acceleration of changes in direction that requires active plantar flexion of the foot and simultaneous extension of the knee. Patient often complains of a sudden, intense pain at the back of the leg, difficulty in contracting the muscle, and thus preventing weight bearing on the affected leg. Clinically, there is diffuse swelling or bruising of the calf. The symptoms and signs usually resolve after a few weeks with a low recurrence rate. On occasion, this injury may be complicated by associated tears of the plantaris and venous thrombosis.

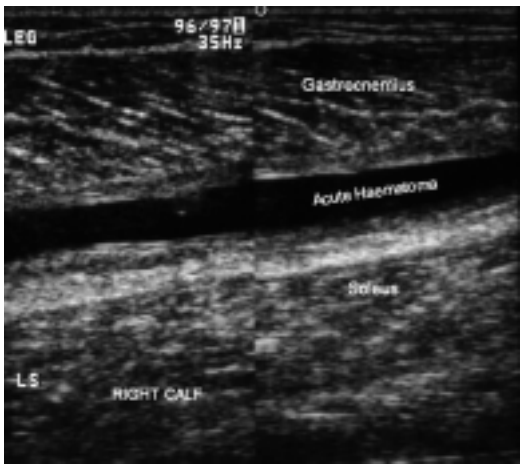

Figure 1. Ultrasound of the medial aspect of the right calf (longitudinal) demonstrating an anechoic fusiform cleft along the aponeurosis between the gastrocnemius and soleus representing an acute haematoma.

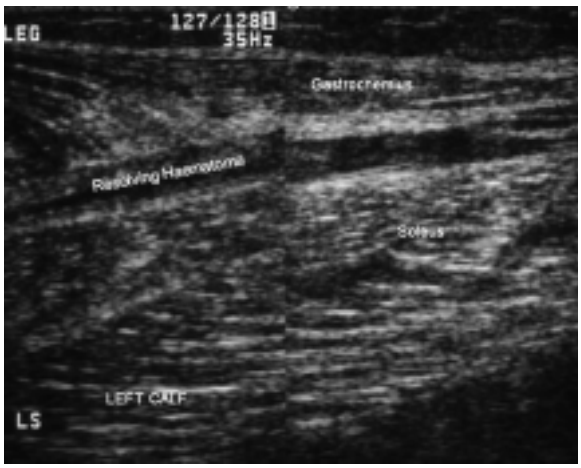

Figure 2. Ultrasound of the medial aspect of the left calf (longitudinal) demonstrating a medium echogenic fusiform cleft along the aponeurosis between the gastrocnemius and soleus representing a resolving haematoma.

Imaging study is often performed to confirm the clinical diagnosis and to assess the severity of the injury. In the assessment of acute muscle injuries, plain radiographs and computed tomography (CT) are not useful. Magnetic resonance imaging (MRI) offers the best soft tissue resolution and differentiation but due to its limited availability and high cost, ultrasonography (US), being non-invasive and readily available, is the next imaging modality of choice.

US examination is performed with a high frequency broadband linear array transducer probe. Our patient was examined in the prone position with the knees in slight flexion and the legs supported by a pillow, which aimed to reduce the stretching of the muscles. Both longitudinal and transverse scans of the calves were made.

The US findings were a linear rupture filled with blood, appearing as a linear anechoic fluid collection and extending between the disrupted medial head of the gastrocnemius and the aponeurosis of the soleus. Occasionally, a muscle-aponeurosis avulsion in the calf will have an appearance similar to that of ectatic veins. There will be no Doppler signal from the lesion in the case of an avulsion. A characteristic feature of myo-tendinous junction avulsion is a change in the orientation of the fibroadipose septa on either side of the aponeurosis in longitudinal images.[2,3]

Within a few days of the injury, the haematoma appears anechoic. Graded compression over the haematoma would reveal partial collapse, which suggests the fluid nature of the content. Over a period of weeks, the haematoma will appear as a hypoechoic area starting from the periphery and gradually proceeding to the centre as the central fluid collection decreases in size. Over a period of months to years, a residual hyperechoic area may be seen and has been attributed to reparative fibrous tissue.

On occasions, ultrasound guided needle puncture and drainage can be performed with a hypodermic 18G needle, which may produce a rapid relief of symptoms and restoration of function. Surgery is often not the treatment of choice.

References

1. Miller WA. Rupture of the musculotendinous juncture of the medial head of the gastrocnemius muscle. Am J Sports Med 1977;5(5):191-3.
2. Bianchi S, Martinoli C, Abdelwahab IF, Derchi LE, Damiani S. Sonographic evaluation of tears of the gastrocnemius medial head ("tennis leg"). J Ultrasound Med 1998;17(3):157-62.
3. Karim Z, Wakefield RJ, Conaghan PG, Lawson CA, Goh E, Quinn MA, et al. The impact of ultrasonography on diagnosis and management of patients with musculoskeletal conditions. Arthritis Rheum 2001;44 (12):2932-3.