CASE REPORT

Pseudothrombophlebitis syndrome: Sonographically guided treatment of a partially ruptured Baker's cyst

Evangelos Perdikakis

Department of Radiology, 412 General Military Hospital-212 Mobile Army Surgical Hospital, Greece

Correspondence: Evangelos Perdikakis. Address: Department of Radiology, 412 General Military Hospital, 212 Mobile Army Surgical Hospital. Terma Lefkou Pyrgou 67100, Xanthi, Greece. Email: perdikakis_ev@yahoo.gr.

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Abstract

Popliteal or otherwise called Baker's cyst represents a fluid distension of the gastrocnemiosemimembranosus bursa and is usually incidentally found on imaging studies. However, the clinical manifestation of symptomatic Baker's cyst is similar to thrombophlebitis hence the term pseudothrombophlebitis syndrome. We add to the literature a case of a partially ruptured popliteal cyst in which locally injected ropivacaine (ropivacaine hydrochloride) and steroid (betamethasone acetate-betamethasone sodium phosphate) injection relieved the symptoms completely. We describe the clinical and imaging features and the treatment applied.

Key words

Pseudothrombophlebitis, Baker's/popliteal cyst, Local injection/therapy

1 Introduction

The term pseudothrombophlebitis syndrome is used for symptomatic popliteal cysts and imaging evaluation is of paramount importance for the differential diagnosis since thrombophlebitis and the ruptured Baker's cyst share a common clinical presentation with calf swelling and pain [1-4]. Imaging can also be valuable in the differential diagnosis of symptomatic Baker's cyst from other etiologic factors that may present with the same clinical manifestations such as septic arthritis or traumatic injuries [1-4]. Since the painful symptomatic cyst can be treated conservatively with restraint of activity and routine analgesics, surgery is only reserved in very complicated cases when conservative treatment fails to relieve the symptoms [1-4]. Different techniques have been described and either open excision or arthroscopic treatment can be applied. However, minimally invasive and interventional techniques are increasingly being used in painful musculoskeletal syndromes with excellent therapeutic outcome [5-7]. Total or complete rupture of the cyst is considered a self-limited condition but partial-incomplete rupture, as in our patient, with no or limited reduction in cyst volume may result in constant symptomatology [1-7]. We add to the literature a case of an uncommon partially ruptured popliteal cyst and describe the clinical and imaging findings together with the treatment applied. To the best of our knowledge, it is the first reported case of this combined therapeutic approach of pseudothrombophlebitis syndrome.

2 Case report

A 69-year-old female patient presented to the orthopaedics department with complaints of knee discomfort and calf swelling. History revealed that symptomatology initiated acutely 24 hours prior to admission and she did not recall any major traumatic injury. No laboratory evidence of infection was identified. Physical examination showed knee effusion and tenderness with palpation over the medial gastrocnemius muscle (see Figure 1). The calf was hot and swollen and deep knee flexion was severely restricted. Deep venous thrombosis was initially suspected and the clinicians requested an ultrasound exam that did not reveal any venous thrombus. However, the ultrasound examination showed a cystic mass located in the popliteal fossa (see Figure 2). Furthermore ultrasound depicted heterogeneous echotexture of the cystic mass, no internal vascularity and findings indicative of a tear at the lower pole of the lesion with fluid extension in the surrounding tissues (see Figure 2). The patient's medical history in correlation with the clinical, laboratory and radiologic features suggested the diagnosis of a ruptured Baker's cyst. She was placed on routine analgesic and anti-inflammatory drugs but her pain and disability remained. A subsequent MRI exam performed one week later verified the presence of the popliteal cyst and demonstrated also the findings of partial cyst's rupture with no reduction in cyst volume (see Figures 3-4). The patient's failure to respond to conservative treatment directed us in applying a different therapeutic scheme. She was treated successfully with ultrasound-guided cyst aspiration followed by instillation of a mixture of long acting analgesic (ropivacaine hydrochloride, 2mg/ml) and steroid (betamethasone acetate-betamethasone sodium phosphate, 3mg/ml) (see Figure 5). Pain subsided within 24 hours and was totally pain free at 3 weeks follow-up with full knee function.

Figure 1. (A) The photograph shows right lower leg edema. Compare with the normal left extremity. (B) Tenderness with palpation over the medial gastrocnemius muscle and increased temperature of the symptomatic calf was noted.

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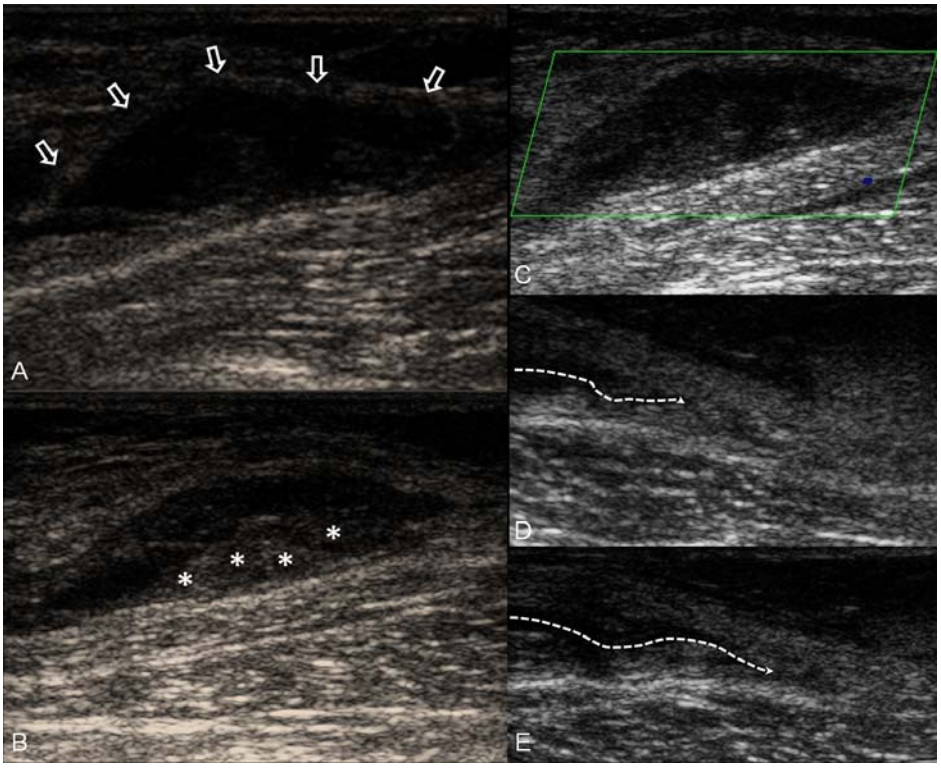

Figure 2. (A) The longitudinal US image shows a heterogeneous, hypoechoic cystic lesion (open arrows in a) in the popliteal fossa. (B) The longitudinal US image with slight angulation of the probe shows the heterogeneous cyst in the popliteal fossa and demonstrates better the intracystic heterogeneity which corresponds to intralesional floating debris (asterisks). (C) The colour Doppler US image shows no internal vascularity. (d-e) The longitudinal US images at the lower pole of the cyst show evidence of rupture and free fluid in the surrounding tissues. Dashed line-arrow shows the schematic demonstration of the fluid route.

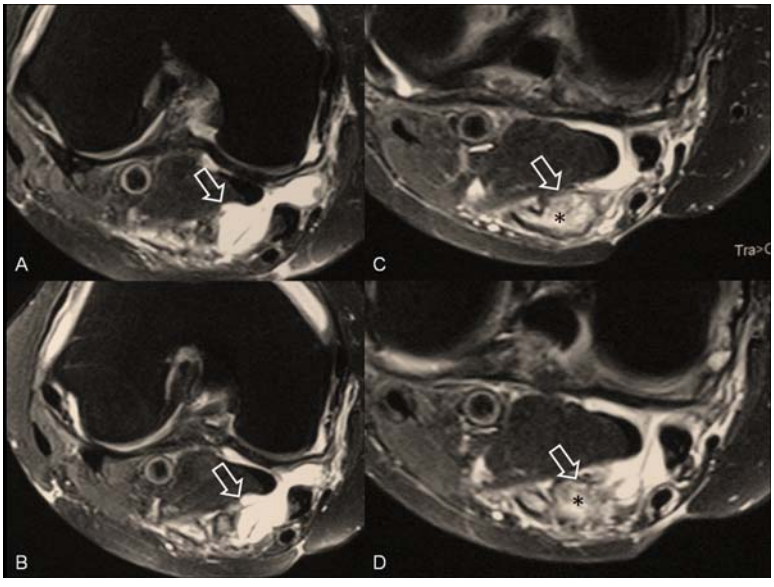

Figure 3. (A-D) The axial fat saturated T2-w MR images verify the presence of the popliteal cyst (open arrows). Note intralesional heterogeneity (asterisks in c, d) and perilesional free fluid, findings indicative of cyst's partial rupture.

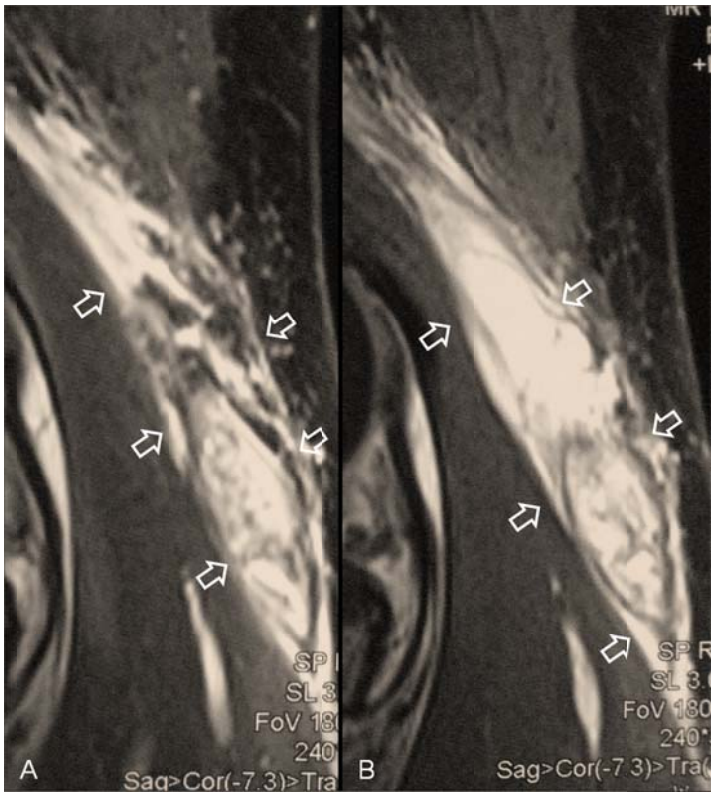

Figure 4. (A-B) The ruptured popliteal cyst (open arrows) is easily demonstrated in the sagittal fat saturated T2-w MR images. Note also the intracystic debris and the pericystic fluid as well as the remaining-constant cyst volume despite rupture and conservative treatment.

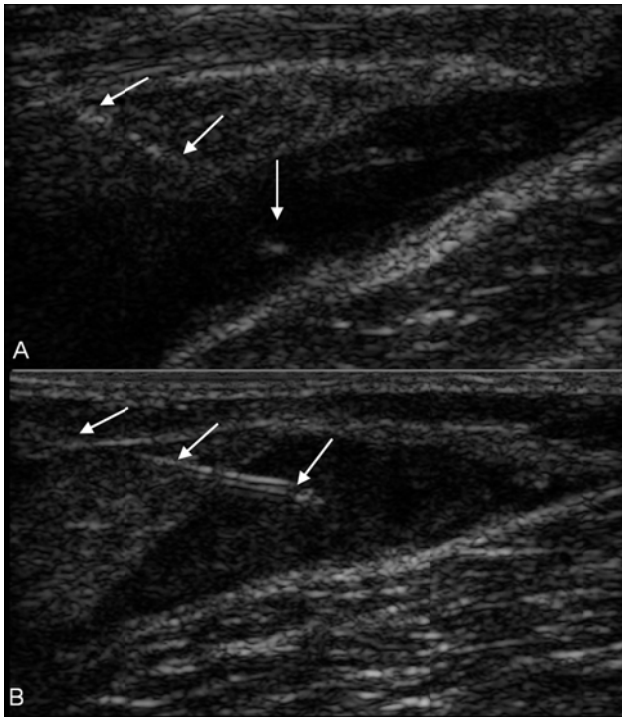

Figure 5. (A-B) Ultrasound-guided treatment. White arrows show the needle inside the cyst.

3 Discussion

Popliteal cyst is usually an incidental finding in imaging studies and represents a fluid distension of the gastrocnemio semimembranosus bursa [8-10]. Regarding its etiology, it has been associated with other knee disorders such as meniscal tears and degenerative osteoarthritic joint disease and its frequency has been shown to increase with age [9-10]. According to the literature, imaging and arthroscopy can identify various predisposing factors that may result in fluid distension of the gastrocnemiosemimembranosus bursa, such as rheumatoid arthritis, juvenile arthritis, degenerative osteoarthritis and post-traumatic cartilage tears [1-12]. Regarding its pathogenesis, a valvular mechanism between the knee joint and the bursa has been implicated, that allows joint fluid to communicate in a unidirectional mode [1-12].

Baker's cyst can be effectively diagnosed with magnetic resonance imaging because the fluid distented gastrocnemio semimembranosus bursa is easily depicted on T2-weighted MR images, especially in the axial plane [8-12]. Ultrasound depiction of popliteal cysts has been shown to be highly accurate and comparable even to MRI [8-12]. Sonographic evaluation of the popliteal fossa can depict the fluid-distended bursa between the semimembranosus and medial gastrocnemius tendons [8-12]. The sonographic features of Baker's cysts are usually those of simple cyst (anechoic-hypoechoic, posterior acoustic enhancement, thin and imperceptible walls). However, complications such as hemorrhage, rupture, the presence of intraarticular loose bodies and synovial proliferative reactions-diseases may produce a more heterogeneous echotexture [2, 8-12]. Differential diagnosis from other cyst like lesions and soft tissue tumors is thus imperative and requires an MRI examination protocol in the aforementioned cases [2, 9-11]. Another issue that needs mentioning in the differential diagnosis is the compartment syndrome of the lower leg. It is a severe complication following fractures and soft tissue trauma but can also be encountered as a reperfusion injury after acute arterial obstruction [13]. It manifests with severe pain and the diagnosis relies on clinical examination and intracompartmental pressure measurements. If left untreated, severe complications with muscle contractures, deformities, nerve paralysis, and sensory neuropathy can be encountered [13]. Once the diagnosis is suspected, immediate fasciotomy is the treatment of choice [13].

Since popliteal cysts are often asymptomatic and resolve spontaneously they do not require any aggressive surgical treatment at initial depiction [14-16]. The term pseudothrombophlebitis syndrome is used for symptomatic popliteal cysts and imaging verification is of paramount importance for the differential diagnosis since vein thrombosis and the ruptured Baker's cyst share common clinical manifestations with acute calf swelling and pain. Ultrasound particularly is a widely available, non-invasive, and very effective in terms of diagnostic value and cost, imaging modality that assists in the differential diagnosis of thrombophlebitis from pseudothrombophlebitis syndrome [8-16]. Rupture of a Baker cyst is usually a self-limited condition and the painful symptomatic cyst can be treated conservatively with restraint of activity and routine analgesics [1-4, 14-17]. Surgery is only reserved in complicated cases when conservative treatment fails to relieve the symptoms. Different operative techniques have been described and either open excision or arthroscopic treatment can be applied [14-17]. Open excision, however, is reported to have a high recurrence rate (up to 60%) [14, 17]. Arthroscopy, on the other hand, has the advantage of simultaneously correcting both the valvular opening and the associated predisposing intra-articular pathology that is responsible for cyst generation [14, 17]. In our case the patient's non response with the initial treatment resulted in constant symptomatology. Failure to respond to conservative treatment and the partial nature of the cyst's rupture directed us in applying a different therapeutic scheme. A combined treatment with ultrasound guided cyst aspiration and subsequent local injection of long acting analgesic and steroid was given. Percutaneous guided treatments have been used successfully for pain management in symptomatic Baker cysts and have been proven effective in pain relief and cyst volume reduction in recent studies, obviating thus the need for surgical therapy [5-7, 14-18].

In summary, a rare case of a partially ruptured popliteal cyst is presented herein. The clinical, US, MR imaging characteristics are demonstrated and the treatment applied is described. Further studies are needed in order to elucidate the efficacy of percutaneous aspiration and subsequent injection of long acting analgesic and steroid as a first step therapeutic option in pseudothrombophlebitis syndrome.

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