

POSTERIOR TIBIAL NEUROPATHY BY A BAKER'S CYST : Case Report

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Baker's cysts are among the most infrequent causes of peripheral nerve entrapment and only a few cases of tibial nerve entrapment resulting from the popliteal cyst in the calf muscle have been reported in the literature.

We present a case of rheumatoid arthritis with a Baker's cyst, complicated by the development of a tibial nerve entrapment. It is important to diagnose a Baker's cyst early and to differentiate it from thrombophlebitis, a popliteal aneurysm, tumor or muscle tear, to effect optimal therapy and to obviate a potential neuropathy. Prompt recognition of these cases may save the patients unnecessary procedures and delay in treatment.

Key Words : Baker's cysts, posterior tibial neuropathy, rheumatoid arthritis

INTRODUCTION

Baker's cysts are found in severe polyarthritis and formed by the escape of synovial effusion from the knee joint into one of the popliteal bursae, herniation of the posterior joint capsule or herniation of the posterior knee synovium¹. Although most Baker's cysts are commonly identified as an asymptomatic mass occurring just below the popliteal fossa, the fluid may further extravasate into a deep compartment or cause nerve compression with symptoms of local pain and tenderness².

Recently, we experienced a case of posterior tibial neuropathy caused by a Baker's cyst in a 64-year-old woman who suffered from rheumatoid arthritis. She had manifestations of posterior tibial neuropathy, including pain and numbness of the sole, weak flexion of the big toe and decreased right ankle jerk. The diagnosis of entrapment neuropathy was entertained preoperatively by electromyography and nerve conduction study. Her pain

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resolved following surgery. We present this case with a

review of the literature.

CASE REPORT

A 64-year-old woman was presented to us with a two-year history of arthritis, most marked in the knees and both hand proximal interphalangeal joints (PIP) and associated with left ankle pain, in October 1998. Past medical history revealed a history of hypertension and intracerebral hemorrhage. Rheumatoid arthritis was diagnosed according to the revised ACR criteria, based on a symmetric polyarthritis involving the PIP, shoulders, left ankle and knees, morning stiffness and the presence of rheumatoid factor.

She was treated with hydroxychloroquine and methotrexate, but an exacerbation occurred involving the right knee in January 1999. Also, she had numbness of the sole. At radiologic evaluation of the knees, narrowing of the medial joint space and joint effusion were noted, but no erosion was seen. Treatment with local steroid injection was resumed with increments of methotrexate doses.

Within a few weeks of local steroid injection in the knee joint, however, right knee pain worsened and

numbness of the sole continued. She gave no history of prior injury or other paraesthesia.

On physical examination, she revealed pain and increased sensation along the plantar aspect of the foot and the mass was palpable on the posterior aspect of the right knee. Also, she showed weak flexion of the big toe and decreased right ankle jerk.

A lobulated $4 \times 4 \times 3$ cm³ cystic lesion with inhomogeneous signal intensity was seen on ultrasound. The needle aspiration of the right knee joint was unproductive, and magnetic resonance imaging of the right knee and popliteal fossa was obtained and revealed a Baker's cyst (Fig. 1). The cyst extended towards the popliteal tendon and lateral collateral ligament and there was no evidence of deep vein thrombosis.



Fig. 1. T2 weighted magnetic resonance image of the left knee and popliteal fossa. The hyperintense lesion represents the Baker's cyst.

On electromyography, 3+ and 2+ fibrillation and positive sharp waves potentials were observed in the abductor hallucis and tibialis posterior showing abnormal spontaneous response. During contraction, polyphasic motor unit was observed in the abductor hallucis and tibialis posterior.

On nerve conduction studies, proximal latency and amplitude in the right tibial nerve was 15.4ms and 0.1mV, showing low amplitude and delayed proximal latency of right tibial compound muscle action potential.

Repeated needle aspiration was unproductive, and open surgical procedure was performed. At operation, a lobulated cystic lesion displacing neurovascular structures was released, but neurovascular invasion by a cyst was not found (Fig 2). The cavity contained many folds and



Fig. 2. Surgical specimen of Baker's cyst showing lobulated cystic lesion.



Fig. 3. Biopsy specimen revealing a cyst with synovial lining which is compatible with Baker's cyst.

measured $4 \times 4 \times 3$ cm³, and extended anteriorly toward the posterior cortex of the tibia. The communication between the synovial compartment and the cavity was present near the popliteal hiatus. The biopsy finding was compatible with Baker's cyst due to rheumatoid arthritis (Fig 3). Her pain resolved following surgery, but mild degree of numbness remained.

DISCUSSION

Baker's cyst represents a distended gastrocnemio-semimembranosus bursae. The cyst has a synovial lining similar to joint synovium and communicates with the knee joint by a long thin stalk. The cysts are formed by the escape of synovial effusion from the knee joint into one of the popliteal bursae, herniation of the posterior joint

capsule or herniation of the posterior knee synovium¹.

Any intra-articular process associated with effusion may lead to distension of this bursa through a one-way valve mechanism. Although most Baker's cysts remain asymptomatic or are associated with only mild localized symptoms, a variety of complications have been reported^{2,3,4,5,6,7,10,11}. It may cause mild discomfort or pain and tenderness at the posterior aspect of the knee. Baker's cysts can produce neuropathy by direct pressure on the nerve, either gradually or suddenly. The most dramatic complication is acute rupture with the clinical presentation often called the pseudothrombophlebitis syndrome¹⁰.

Herein, we report the case of a patient with a Baker's cyst complicated by a posterior tibial neuropathy. It seems that although the cyst was unruptured, there were patient positions that could cause the expansion of the Baker's cyst, producing compression of the posterior tibial nerve. The diagnosis of entrapment neuropathy was entertained preoperatively by electromyography and nerve conduction study.

This case is interesting because tibial nerve neuropathy is rare in Baker's cyst. Previous reports in the literature on tibial nerve neuropathy from Baker's cyst are summarized in Table 1.

Table 1. Entrapment neuropathy from a Baker's cyst. Review of the literature.

Authors(year)	Ref. No. of patients	Type of arthritis	Type of treatment
Nakano(1978)	8	5 - RA 1/5 - trauma	4/5 - IAI 1/5 - synovectomy
Kashani(1985)	9	1 DJD	1 IAI
Dash(1998)	3	1 PsA	1 IAI

RA - rheumatoid arthritis

DJD - degenerative joint disease

PsA - psoriatic arthritis

IAI - intra-articular injection

Nakano⁸ presented the first clinical cases of 5 patients with entrapment neuropathy from Baker's cyst. Four patients had classical rheumatoid arthritis, while foot-drop developed in one man after trauma to the knee. In four patients, intra-articular steroid injections relieved the symptoms of pain, with gradual return of motor and sensory function of the lower limb, while one patient required synovectomy. In 1985, Kashani et al.⁹ described

a case of degenerative joint disease of both knees, complicated by a Baker's cyst. He responded well to knee joint aspiration and intra-articular prednisone injection. Recently, Dash et al.³ reported a case with psoriatic arthritis, ruptured Baker's cyst and entrapment neuropathy. He was treated with intra-articular corticosteroid injections with improvement.

It is important to diagnose a Baker's cyst early and to differentiate it from thrombophlebitis, a popliteal aneurysm, tumor or muscle tear, to effect optimal therapy and to obviate a potential neuropathy. Intra-articular steroid injections often benefit the patient immediately, while refractory and recurrent cases may require synovectomy.¹¹

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