Cystic Formation Compressing the Femoral Vein: Synovial Hip Joint or Adventitial Cyst

S. Fukui*, N. Paraskevas¹, C. Lafaurie², P. Soury¹, F. Gigou¹, M.-D. Petit¹ and C. Laurian¹

Departments of ¹Vascular Surgery, Fondation-Hôpital Saint-Joseph, Paris, and ²Orthopedic Surgery, Clinique Saint-Louis, Poissy, France

Femoral vein compression by a cyst is a rare feature. The most frequent aetiology is a synovial cyst of the hip joint. Adventitial cyst of the femoral vein is a much more infrequent cause. Morphological examination (Doppler US, CT scan or MRI) can easily recognise the cystic nature of the lesion but differentiation between these two causes can be difficult to make. In case of a synovial cyst, a plane of dissection can be found between the cyst and the femoral vein. This plane does not exist in case of adventitial cyst. The histological examination is identical because both cyst formations have the same tissue origin. We report four cases of femoral vein compression caused by a cystic lesions treated at our institution.

Synovial cysts are commonly located in the knee or wrist joint. The hip joint is an infrequent site of synovial cyst formation. Because the femoral vein lies close to the joint, the synovial cyst can compress the vein and produce swelling of the leg. Adventitial cyst of the femoral vein is a very rare case. The cyst develops in the adventitia of the vein wall causing narrowing of the vein lumen. We report our experience in the treatment of femoral vein compression caused by a cystic mass.

Case 1

A 32-year-old woman presented with swelling of the right lower limb. No other abnormality was found on physical examination and deep vein thrombosis was suspected. The ultrasonography showed a narrowed but patent femoral vein. A CT scan showed a 5 cm well circumscribed cystic mass adjacent to and compressing the femoral vein. No plane of dissection was found between the cyst and the femoral vein (Fig. 1). Surgical exploration demonstrated a fluctuant mass lying beneath the common femoral vein compressing it and severely narrowing its lumen. Division of the vein from the cyst was very difficult. The venous wall was damaged in several places and was repaired by simple suture. The cyst was then opened longitudinally and mucoid material escaped under pressure. As much of the external surface of the cyst as possible was excised. The lumen of the vein appeared to be of normal size. On the posterior aspect, a communication with the hip joint was found and was disconnected. The postoperative period was uneventful. Duplex ultrasonography showed no residual compression. Histological examination showed that the cyst was lined by columnar epithelium, surrounded by connective tissue confirming a cyst of synovial origin. The diagnosis was adventitial cyst of the femoral vein.

Case 2

A 77-year-old man presented with a swelling of the right lower limb. During clinical examination a mass of the groin was noticed. This mass was not pulsatile. Ultrasonography showed a narrowed but patent femoral vein and a fluid-filled mass lying posteriorly to the femoral vein. A CT scan showed a 6 cm diameter mass, filled with fluid, lying anterior to the right hip underneath the femoral vessels and impinging the femoral vein. A plane of dissection between the cyst and the femoral vein was found and confirmed during
At operation, a fluctuant mass was found beneath the common femoral vein which was easily dissected free. No communication with the hip joint was established. The cyst was removed and the postoperative course was uneventful. Duplex ultrasoundography showed the absence of residual compression. Histological examination showed that the cyst was lined by columnar epithelium, surrounded by connective tissue confirming a cyst of synovial nature. The diagnosis was hip joint synovial cyst.

Case 3

A 63-year-old man presented with a swelling of the right lower limb. Six years before, he had had a surgical operation on his right hip. Since then he was compelled to limp and had limited movement of the hip. Two days before admission, he noticed a sudden swelling of the right lower limb. Ultrasonography showed a narrowed but patent femoral vein and a fluid-filled mass just posterior to the femoral vein. This was confirmed by CT scanning. At operation a fluctuant mass distinct from the common femoral vessels was found. There was no communication between the hip joint and the cyst. The cyst was removed and the postoperative course was uneventful. Duplex ultrasonography showed an absence of residual compression. Histological examination showed that the cyst was of synovial nature. The diagnosis was hip joint synovial cyst.

Case 4

A 74-year-old man presented with a right groin mass causing pain and limited motion of the right hip. Examination of the right groin revealed a mass lying below and lateral to the inguinal ligament. The mass was firm, non-tender, and appeared to be attached to deep structures. It was had no pulsation and there was no cough impulse. Ultrasonography demonstrated a well delineated cyst and the MRI demonstrated a liquid-filled soft tissue mass, posterior to the femoral vessels responsible for femoral vein compression. A plane of dissection between the femoral vein and the cyst was noticed (Fig. 2). At operation the mass was easily dissected free from the common femoral vein and artery.

**Fig. 1.** CT scan of inguinal regions showing an adventitial cyst anterior to the hip joint (AC, adventitial cyst; FA, femoral artery; FV, femoral vein). No plane of dissection exists between the femoral vein and the cyst.

**Case 4**

A 74-year-old man presented with a right groin mass causing pain and limited motion of the right hip. Examination of the right groin revealed a mass lying below and lateral to the inguinal ligament. The mass was firm, non-tender, and appeared to be attached to deep structures. It was had no pulsation and there was no cough impulse. Ultrasonography demonstrated a well delineated cyst and the MRI demonstrated a liquid-filled soft tissue mass, posterior to the femoral vessels responsible for femoral vein compression. A plane of dissection between the femoral vein and the cyst was noticed (Fig. 2). At operation the mass was easily dissected free from the common femoral vein and artery.

**Fig. 2.** Synovial cyst: MRI reveals high signal intensity on T2-weighted images. (a) Frontal (SC, synovial cyst). (b) Transversal (SC, synovial cyst; FA, femoral artery; FV, femoral vein). Synovial cyst and femoral vein are well separated.
No open connection with the hip joint and the cyst was excised. Histological examination showed that the cyst was of synovial nature. The postoperative course was uneventful and the patient was discharged on the third postoperative day. The absence of residual compression was confirmed by duplex ultrasonography. The diagnosis was hip joint synovial cyst.

Discussion

A hip joint synovial cyst or an adventitial cyst can compress the femoral vein. The clinical and morphological features of these both cystic formations are very similar. Hip joint synovial cysts occur occasionally and develop on the ilioinguinal bursa, which is the largest synovial bursa of the hip. This overlies the thin anterior portion of the hip joint capsule, which is composed of the iliofemoral and ischiofemoral ligaments, immediately posterior to the iliopsoas muscle.2,3 Two types of synovial cysts have been described. The first type includes communication with the hip joint. The second type does not present a communication with the joint. Communication with the hip joint may develop secondary to chronic synovial effusion as in osteoarthrosis or rheumatoid arthritis. The increased intraarticular pressure can produce fluid exchange between the joint and the bursa. This dynamic process is regulated by valvular mechanisms; bursa can therefore act as a volume reservoir.2 The communication can also be the result of previous surgery of the hip as for our third case even if no patent communication was disclosed at surgery. When there is no communication with the hip joint, hypertrophic and villous proliferation of the bursa lining the cyst can provoke subsequent fluid overproduction and lead to isolated bursa enlargement and iliopsoas bursitis.2,3

The exact aetiology of adventitial cyst formation remains unclear. One interesting theory, which also applies to the popliteal artery is that the cyst develops from synovial rests sequestrated in the vessel wall during development. As for the popliteal region, a communication between the cyst and the knee joint can be demonstrated as was the case in our first patient.1 Nevertheless, hip joint cyst and adventitial cyst share the same tissue origin. Histological examination cannot make the differential diagnosis between the two causes. In both cases, it shows that the cyst is lined by columnar epithelium, surrounded by connective tissue confirming a cyst of synovial nature.

The clinical feature is a groin mass or a swelling of the leg due to femoral vein compression. Because of its location under the femoral vein, the mass is difficult to palpate. Clinical examination cannot differentiate the two causes.

Ultrasonography, CT scan and especially MRI can easily establish the cystic nature of the lesion.4 MRI reveals intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted images. The presence of hip joint abnormalities as in osteoarthritis or Paget is in favour of a joint synovial cyst.5 The presence of a plane of dissection between the femoral vein and the cyst is also in favour of a joint synovial cyst. Venography shows external compression of the femoral vein but it is not necessary for the diagnosis. Arthrography can demonstrate labral tears and filling of a soft tissue mass adjacent to the supraacetabular bone.5 With CT scan or MRI arthrography, this is not warranted.

Because of the risk of venous thrombosis secondary to the compression caused by the cyst, decompression of the vein should be performed.6 Needle aspiration can decompress the vein but this treatment is associated with a high rate of reoccurrence and we prefer the surgical excision.

During surgery, in case of a hip joint synovial cyst a plane of dissection can easily be found between the cyst and the femoral vein. No reconstructive surgery of the femoral vein is necessary. In case of an adventitial cyst, separating the femoral vein from the cyst is very difficult or impossible and vein repair or reconstruction is often necessary.1 Thus, differentiation between these two aetiologies is important to adapt the operative strategy. Surgical removal of the cyst restores normal venous return and promptly relieves the patient’s symptoms.7
References


Accepted 5 May 2004