CLINICAL REPORT

Primary aneurysmal bone cyst of the patella: A case report

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Summary An aneurysmal bone cyst is rare in the patella. We report the case of a 28-year-old woman who presented with chronic pain and no previous trauma history. Treatment included curettage of the cyst and filling with a corticocancellous graft. Thirty-one months after surgery, the knee was mobile and painless and graft incorporation was good.

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Introduction

An aneurysmal cyst is a benign tumor whose physiopathology and etiology are unknown, described for the first time by Jaffe and Lichtenstein [1]. It represents less than 1% of all bone tumors with a tendency to develop in the metaphysis and less frequently in the spine and sacrum [2—5] of patients after the age of 20 [2—4]. Development in the patella is rare and can be primary [5—11] or secondary to a trauma or a preexisting lesion [12—16]. Treatment usually includes curettage of the lesion and filling with a cancellous or corticocancellous graft [2—7,9,12—15]. Recurrence is not unusual and certain authors prescribe adjuvant treatment such phenol and cryotherapy [8,16]. Embolisation or patellectomy is often used if surgery would be traumatic or in case of significant invasion of the patella with destruction of the articular surface [10,11,15]. We report the case of a primary aneurysmal cyst in a 28-year-old woman.

Observation

A 28-year-old black woman consulted in October 2006 after one year of chronic knee pain. The clinical assessment did not show any recent trauma or signs of local inflammation. Palpation of the patella was painful but there was swelling compared to the contralateral side. Articular range of motion was normal. Hemogram, CRP and ESR were completely normal. Standard X-ray showed images of diffuse "geographic" osteolyses with smooth borders leaving the articular surface intact (Fig. 1). Tomodensitometry (CT Scan) confirmed the presence of fluid-filled multiseptate cavities suggesting an aneurysmal cyst or chondroblastoma. The articular surface was intact (Fig. 2). The absence of intralesional calcifications and the presence
of separate multiseptate cavities suggested an aneurysmal cyst. Treatment includes curettage and a cancellous or corticocancellous bone graft, and resection biopsy was decided upon without prior biopsy. A mid-line surgical approach was used, showing the presence of separate blood filled cavities (Fig. 3). Curettage was performed on the cyst. The articular cartilage was not exposed. The lesion was filled with an autologous corticocancellous graft (Fig. 4). Histological assessment of the curettage surgical sample showed empty bloody cavities or the presence of red blood cells. These cavities were separated by conjunctive tissue composed of fibroblasts, giant multinucleated cells, some macrophages, masses of hemosiderin and trabecular bone, confirming the diagnosis of an aneurysmal cyst (Fig. 5).

The outcome of surgery was good. The patient was immobilised in a cruromalleolar cast for one month and underwent physical rehabilitation. At final follow-up in June 2009, or

Figure 1  Knee X-ray showing osteolytic areas of the patella with smooth edges.

Figure 2  CT scan shows an intact articular surface.

Figure 3  Blood filled multiseptal cavities of the patella at surgery.

Figure 4  Filling with autologous corticocancellous grafts at surgery.

Figure 5  Histological features showing blood filled or empty cavities often surrounded by an endothelium. These cavities are separated by conjunctive tissue composed of fibroblasts, giant multinucleated cells, some macrophages, a mass of hemosiderin and trabecular bone.
Primary aneurysmal bone cyst of the patella: A case report

Bone tumors of the patella are rare with 69 cases in 35 years in the tumor registry of four European countries [2] and most tumors are benign [2–4]. These tumors are found in patients before the age of 40 and are mainly chondroblastomas, giant cell tumors, osteoid osteomas, solitary cysts and aneurysmal cysts [2].

An aneurysmal cyst in the patella is also rare with six cases in 35 years in the same multicentric study of four European countries [2] and 14 cases have been published in the literature [2,5–7]. They usually occur in young women in their twenties [2–4,13]. The presentation may be classic, with a primary bone lesion composed of separate multiseptate compartments, secondary to trauma or associated with a tumor, in particular a chondroblastoma, a giant cell tumor or an osteosarcoma.

The presentation varies but usually includes mechanical pain that may or may not be associated with functional incapacity. It may be discovered by chance due to a complication from disease progression, in particular a pathological fracture [7]. Clinical examination of the knee is normal or with some swelling of the patella or slight amyotrophy of the quadriceps [12,13]. Standard X-ray suggests a diagnosis by showing multiseptate cavities.

CT scan and especially MRI (which we did not perform in this case) confirm the presence of fluid-filled spaces separated by intracystic walls and allows assessment of any invasion into the articular surface. On MRI, the fluid is a high intensity signal on T2 weighted and a low intensity signal on T1 weighted sequences. T2 weighted sequences mostly show fluid content and levels, while T1 weighted sequences provide better assessment of bone cortex [4,17].

A differential diagnosis must be made with other patellar lesions that may be benign, malignant, primary or metastasized.

Ossification of the patella is similar to that of the epiphysis and apophysis of the long bones. The differential diagnosis is mainly with benign tumors that usually develop in the epiphysis of the long bones, in particular giant cell tumors or chondroblastomas. Other benign tumors can develop in the patella, but are less frequent: osteoid osteoma, osteoblastoma and osteochondroma. Bone metastases can develop in the patella but the most frequent malignant primary tumor is osteosarcoma. Radiological diagnosis can be difficult especially in the presence of telangiectasic osteosarcoma where the radiological picture or even the features of MRI are similar to an aneurysmal cyst. The levels of fluid and number of septa can also vary [17–19]. Thus, a biopsy is essential to make the diagnosis because it is often difficult to distinguish an aneurysmal patellar cyst from other patellar lesions.

Although the diagnosis is confirmed by histology, this can be complicated by the presence of numerous giant cells (giant cell tumors) as well as osteoforming tumors, when bone compaction is abundant (osteoblastoma or osteosarcoma) in the intercavity walls. It is also important to evaluate any associated lesions [20].

Treatment of an aneurysmal cyst depends on the stage of the cyst. Normal treatment is curettage and filling with cancellous or corticocancellous bone or an allograft [4–9,11–14,16] but rare cases of spontaneous cure or cure after biopsy have been reported [21].

Single or repeat selective embolisation may be used, in particular if surgery is traumatic [6,14]. Although patellectomy was proposed in the initial series in the literature [10,11,15] this option should not be proposed before first attempting primary patellar reconstruction [7,14].

The use of phenol and cryotherapy as adjuvant treatment can limit the risk of recurrence or damage to soft tissues, but especially of patellar necrosis because of limited vascularisation [8].

Curettage and filling with cancellous grafts provide excellent results and good graft incorporation, as in our patient. No cases of recurrence or malignant transformation of the patella have been reported in the literature [6–11]. However recurrence has been reported in other locations except if wide resection is performed [22]. Factors such as young age, masculine gender, central location, stage and cellular component on histology play a role in recurrence [23–25]. Cases of malignant transformation have been described for other locations, but there is controversy about whether they involved undiagnosed associated lesions, in particular telangiectasic osteosarcoma [26,27].

Monitoring for recurrence, which is the main complication of this benign tumor, should be clinical and paraclinical. MRI is the examination of choice.

Discussion

Bone tumors of the patella are rare with 69 cases in 35 years in the tumor registry of four European countries [2] and most tumors are benign [2–4]. These tumors are found in patients before the age of 40 and are mainly chondroblastomas, giant cell tumors, osteoid osteomas, solitary cysts and aneurysmal cysts [2].

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Conflict of interest statement

None.

References


