Pseudocyst Formation after Intertrochanteric Fracture Fixation: A Case Report


Abstract: We describe a 62-year-old woman who developed two pseudocysts, 25 x 15 cm and 20 x 12 cm, in the left proximal thigh as a complication 19 years after internal fixation of an intertrochanteric fracture. She received a 135° dynamic hip screw and side plate in May 1979. She continued to live at home without major discomfort until May 1997. Two huge pseudocysts were noted in the left proximal thigh without trauma history. Angiography was normal. Computerized tomography scan revealed two voluminous cystic lesions without septa in the left proximal thigh, with accumulated fluid. During surgery, two huge cysts were found in the left proximal thigh, and their orifices were found slightly proximal to the curvature of the side plate. The pathology showed that the cysts consisted of a nonepithelialized wall of granulation tissue compatible with a pseudocyst. The patient had no further problems 2 years after surgery. We found no reports in the literature of this rare complication. The development of the pseudocysts may have been the result of chronic low-grade trauma due to irritation between the soft tissue and the implant. Orthopedic surgeons should be aware of the possible development of this rare complication following internal fixation of an intertrochanteric fracture.

Case Report

A 62-year-old woman fell at home in May 1979, sustaining an intertrochanteric fracture of the left femur. She was admitted to a local hospital for treatment. Two days later, a 135° dynamic hip screw and side plate were used to internally fix the fracture. Five months after surgery she could walk without any aids. She continued to live at home without major discomfort until May 1997, when she began to feel a protruding mass over her left proximal thigh. The swelling was first noted about 6 weeks prior to her first visit for medical help and...
had gradually increased in size since then. She also reported left hip pain during ambulation, and restricted left hip mobility. She visited a local medical clinic, where a biopsy was attempted but was unsuccessful due to massive blood clot extravasation at the biopsy site. The wound was immediately sutured and the patient was referred to our hospital on the same day. She had not taken any anticoagulant medication.

Physical examination revealed an elderly (81-year-old), alert, obese woman in no apparent distress. A 25 x 10-cm mass was noted over the left proximal thigh, predominantly over the antero- and posterolateral aspect, as well as tenderness of the left groin and proximal thigh and buttock, and limited ability to externally rotate her left hip. Her left femoral popliteal and dorsalis pedalis pulses were equal on both sides. No bruit was heard on auscultation of the mass, and no deficits in sensory or motor function were elicited. Radiographs of the left hip showed good union of the previous left intertrochanteric fracture with retention of the dynamic hip screw and side plate. Marked soft tissue swelling of the proximal thigh was also noted (Fig. 1). Laboratory findings included a hematocrit of 38%, and blood cell count, calcium, phosphate, alkaline phosphatase, and C-reactive protein concentrations, and erythrocyte sedimentation rate within normal limits. Computerized tomography (CT) scan of her left hip and proximal thigh revealed two voluminous cystic lesions without septa in the left proximal thigh, with accumulated fluid (Fig. 2). Angiography was performed, but no abnormalities of the superficial or deep profunda branches of the femoral artery were found, and no pseudoaneurysm was seen. In July 1997, the mass was explored through the old scar on her left proximal thigh. Upon incision, approximately 1 L of blood clot was released from the cysts. There were two huge cysts, 25 x 15 cm and 20 x 12 cm, in the left proximal thigh, predominantly within the antero- and posterolateral region (Fig. 3 A), and their orifices were found slightly proximal to the curvature of the side plate (Fig. 3 B). The implant was removed and the cysts excised (Fig. 4). Bacterial cultures of the excised cysts were negative. The cysts consisted of a nonepithelialized wall of granulation tissue (Fig. 5). Tissue histology was compatible with that of a pseudocyst. Two weeks later, the patient was ambulatory without the aid of a walker and with relief of pain. The follow-up period after the operation was 2 years, at which time the patient had no further problems and was completely relieved from any discomfort.

**Discussion**

In the present case, two huge pseudocysts developed 19 years after internal fixation of an intertrochanteric fracture. No similar reported complications were found in a literature search of the MEDLINE® database.

When unexplained thigh swelling is encountered after dynamic (compression) hip screw fixation of an intertrochanteric fracture or other procedures involving the proximal
femur and shaft, the possibility of injury to either the deep or superficial branches of the femoral artery must be considered first [6–11]. Previously reported late complications occurring anywhere between 6 weeks and 10 years after arterial injuries during surgery for intertrochanteric fractures include false aneurysms, arteriovenous fistula, and ischemia of the leg distal to the injured vessel [7, 10, 11]. Injuries at this site have been reported to result from the use of drills, and the placement of long screws and retractors too deeply behind the femur causing compression levering of the artery against bone [6, 8]. Bone fragments can also cause similar injuries [9].

Although the exact mechanism of pseudocyst formation remains unknown, these lesions are typically the result of traumatic insults [12]. Although there have been a few rare reports of acute events, chronic minor trauma, possibly unknown to the patient, is most commonly associated with pseudocyst occurrence [13, 14]. The hematoma and the pseudocyst may represent opposite ends of a continuum of damage and repair of traumatic insults. Development of a pseudocyst could be the outcome of chronic, trivial trauma [12–14]. The formation of pseudocysts is mainly observed on the lateral thigh, hip, buttock, and back, where large muscular surfaces are present. Under excessive stress, the fat compartments may burst open, with rupture of the septa and shearing of the anchorage of the skin and the superficial fascia [12, 13]. This may result in the development of a cavity into which migration of fat, lymph fluid, and blood from the interrupted lymph and blood capillaries continuously drain, resulting in stasis and encapsulation by fibrous connective or granulation tissue, and the subsequent formation of a pseudocyst. In our elderly patient, the pseudocysts may have been caused by trivial trauma such as sliding or a contusion injury. The finding of copious old clotted blood in the two pseudocysts during surgery suggests incomplete liquefaction of a hematoma.

Given operative findings suggesting that the pseudocysts’ orifices were close to the angle in the side plate, it is likely that
the pseudocysts resulted from the irritation between the soft tissue and the implant due to chronic, trivial injury. This complication of an intertrochanteric fracture is apparently quite rare, despite the high incidence of these fractures.

References