Aneurysmal bone cysts can lead to pathological fractures, which require stabilization with internal fixation in weight-bearing bones. Extended curettage decreases the rate of recurrence.

Abstract

Introduction: Aneurysmal bone cyst (ABC) is a rare, benign, and cystic lesion. The most common sites are the femur, tibia, humerus, and spine. It is more common in females and usually occurs during the second decade of life.

Case Report: A 5-year-old female child had a trivial fall, following which she developed pain in her left hip. Radiographs revealed an expansile, lytic lesion in the metaphysis of the left proximal femur. Cortical breach was present, resulting in a pathological fracture. Biopsy of the lesion showed blood-filled cystic spaces confirming the diagnosis of ABC. We performed an extended curettage of the lesion, bone grafting, and angle blade plate fixation. The angle blade plate was removed 1 year after the surgery. Two years later, she complained of pain in the left hip. Radiographs showed a geographic lytic lesion surrounding the previously inserted bone graft. Magnetic resonance imaging revealed multiple blood fluid levels. We performed an extended curettage with high-speed burr. We filled the cavity with bone substitute and stabilized the region using a proximal humerus internal locking system plate. The histopathological examination of intraoperative samples confirmed the diagnosis of recurrence of ABC. We found no further recurrence of the tumor after 3 years of follow-up.

Conclusion: ABCs can present with pathological fractures and require management of the cyst and stabilization of the bone. Recurrent ABCs can be managed by re-curettage of the lesion and prophylactic internal fixation. The curettage has to be extensive through a large cortical window and using a high-speed burr.

Keywords: Aneurysmal bone cyst, recurrence, pathological fracture, treatment.
Two years following the curettage surgery, the child complained of pain in the left hip for 2 months. The pain was insidious in onset, dull aching type, non-radiating, and gradually progressive. On examination, the scar from the previous surgery was found to have healed completely and there were no other significant findings. She had painless, full range of movements of the left hip joint. There was no limb length discrepancy compared to the contralateral limb. Radiographs showed an eccentrically located, geographic lytic lesion in the metaphysis of proximal femur surrounding the dense opacity of the previously inserted bone graft. Pattern of destruction could be identified as Lodwick pattern IB. Cortical thinning and periosteal scalloping were noted in the lesion. There was a narrow zone of transition. Cortex was found to be intact and there was no periosteal reaction. Magnetic resonance imaging (MRI) revealed a well-defined lobular lesion in the metaphysis of proximal femur tending into the diaphysis, and measuring 5.8 × 3.3 × 2.8 cm. Multiple blood fluid levels were noted. Thin incomplete septations were also noted. It was diagnosed to be a recurrence of ABC. We then performed an extended curettage, creating a large cortical window, and performed curettage with high speed burr and thermal cauterization of the lesion. We also augmented the curetted lesion with bone substitute. We stabilized the region using a proximal humerus internal locking system (PHILOS – Depuy Synthes® Switzerland) plate and screws as the pediatric proximal femur locking plate was unavailable at the time. The histopathological examination of intraoperative samples confirmed the diagnosis of recurrence of ABC. We followed up the child for 3 years and found no further recurrence of the tumor. She was walking unaided and had full range of the movement of the left hip joint.

Discussion

ABCs is a hemorrhagic bone tumor. In 70% of the cases, it arises de novo and is called primary ABC. In 30% of the cases, it occurs in underlying bone tumors and is called secondary ABC [4]. Insidious pain is the most common symptom. Swelling and tenderness in the region of the tumor may be present. Radiographs reveal a lytic, expansile lesion, located...
coagulation, phenol, and cryotherapy is termed as extended use of adjuvants such as high-speed burr, argon beam grafting, is the standard treatment for ABCs [13]. Supplemental recurrence [3]. Intralesional curettage, with or without bone Proximal femur ABCs are proposed to have a higher risk of removal of the cyst cavity are risk factors for recurrence [7]. When a pathological fracture occurs, the treatment is required for the cyst as well as the fracture. Primary fixation of pathological fractures in children should be avoided until a histological diagnosis is obtained. Unstable fractures and fractures in weight-bearing bones require internal fixation of the fracture [8]. Fracture fixation for pathological fractures associated with ABC in proximal femur has been described with dynamic hip screw [9], plate osteosynthesis [10], dynamic condylar screw plate system [11], or intramedullary fixation like ender’s nail [12]. We performed a closed, core needle biopsy under fluoroscopic guidance. Only after confirmation of histological diagnosis, we went ahead with the definitive treatment of the lesion with extended curettage of the lesion and bone graft augmentation. We stabilized the fracture with a 4 holed, 135 degree angle blade plate.

ABCs are known to recur after treatment in approximately 10% of the cases. Age <15 years, central location, and incomplete removal of the cyst cavity are risk factors for recurrence [7]. Proximal femur ABCs are proposed to have a higher risk of recurrence [3]. Intralesional curettage, with or without bone grafting, is the standard treatment for ABCs [13]. Supplemenal use of adjuvants such as high-speed burr, argon beam coagulation, phenol, and cryotherapy is termed as extended curettage and has been shown to decrease the rate of recurrence [14]. En block resection has a lower recurrence rate but is associated with significantly greater morbidity. In our case, when the tumor was found to have recurred, we choose performed an extended curettage using a high speed burr and cauterized all the walls of the curetted cavity. We filled the cavity with bone substitute constituting of 60% hydroxyapatite and 40% tricalcium phosphate. The cavity created was significantly larger than the first surgery; hence, we stabilized the region using a PHILOS plate. We believe that the successful treatment with extended curettage with the absence of recurrence demonstrated that extended curettage produces satisfactory results without requiring en bloc excision, even for cases of recurrent ABC.

Conclusion

ABCs can present with pathological fractures and requires management of the cyst and stabilization of the bone. Recurrent ABCs can be managed by recurettage of the lesion and prophylactic internal fixation. The curettage has to be extensive through a large cortical window and using a high speed burr.

Clinical Message

ABCs can lead to pathological fractures. Such pathological fractures in weight-bearing bones require stabilization with internal fixation. Extended curettage decreases the rate of recurrence.

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