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Treatment Combination of a Unicameral Bone Cyst of the Pelvis

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Abstract

Unicameral bone cysts are the most common benign tumor-like bone lesions occurring centrally on meta-diaphyseal areas of long bones such as femur and humerus. Rarely they affect pelvis area. Treatment modality includes immobilization alone, aspiration plus injection of methylprednisolone to more invasive surgical procedures such as curettage and bone grafting with or without internal fixation based on tumor locations' age and activity level of the patient. We describe a 12-year-old male with a two (2) years history of gradual onset of limping gait with no associated palpable mass and tenderness on the right ilium, no lymphadenopathies and leg length discrepancies. An initial radiograph revealed an expansile, lytic, with geographic borders and multi-cystic lesions on his right ilium. The patient underwent a percutaneous cyst aspiration, intralesional curettage, administration of bone substitute, methylprednisolone injection and administration of bone marrow aspirate. Subsequent follow up revealed no limping gait, pain and healed surgical site. Pelvis AP radiograph showed improved and thicker bone sclerosis around the lesions.

Keywords: *Unicameral bone cyst, pelvis, and methylprednisolone, bone substitute, bone marrow aspirate.*

Unicameral bone cysts (UBC), also known as simple or solitary bone cysts, are the most common benign tumor-like bone lesions, typically asymptomatic**[**1**]**. They commonly occur centrally on meta-diaphyseal areas of long bones, particularly the humerus and femur **[**2**]**. Frequently, they are found incidentally (or after a fracture) on imaging and may regress spontaneously. There is no consensus on the best treatment modality. However, the age and activity level of the patient, as well as the size and bone strength, play an essential role in choosing an appropriate treatment option. These include immobilization alone, aspiration plus injection of methylprednisolone to more invasive surgical procedures such as curettage and bone grafting with or without internal fixation based on tumor locations **[**3**]**.

We describe a 12-year-old male with a two (2) years history of gradual onset of limping gait with no associated pain, fever, or previous history of trauma. The patient had no appropriate consultation until one (1) year before admission. The patient presented with no palpable mass, no tenderness on his right ilium,

no associated lymphadenopathies, and leg length discrepancies. An initial radiograph revealed an expansile, lytic, with geographic borders and multi-cystic lesions on his right ilium. MRI was done three (3) months before admission and showed homogenous signal enhancement with fluid content on T2 axial, sagittal, and coronal views (Fig 2). The patient underwent a percutaneous cyst aspiration of approximately 100cc straw-colored serosanguinous fluid followed by intralesional curettage over the right ilium using a trephine needle. A water-based dye was introduced, and finally administration of bone substitute, methylprednisolone, and bone marrow aspirate (Fig 3).

Cytopathology results revealed a negative for malignant cells. Smears and cell block sections show scattered lymphocytes and few neutrophils set against an amorphous and fibrinous background respectively (Fig 5).

At two months postoperatively, the patient presented with no limping gait, no associated pain and tenderness on the operative site, and a healed surgical site. Sclerosis on the right ilium was evident on Fig 6A and Fig 6B pelvis AP radiographs at two-month and fifth-month respectively. The latest seven-month radiograph follow-up showed improved and thicker bone sclerosis around the lesion (Fig 6C).

Figure 1. AP Pelvis Radiograph showing the lesion on the right hemipelvis

Figure 2. MRI of the pelvis in different views showing homogenous signal and no fluid-fluid level. A. Axial. B. Sagittal. C. Coronal

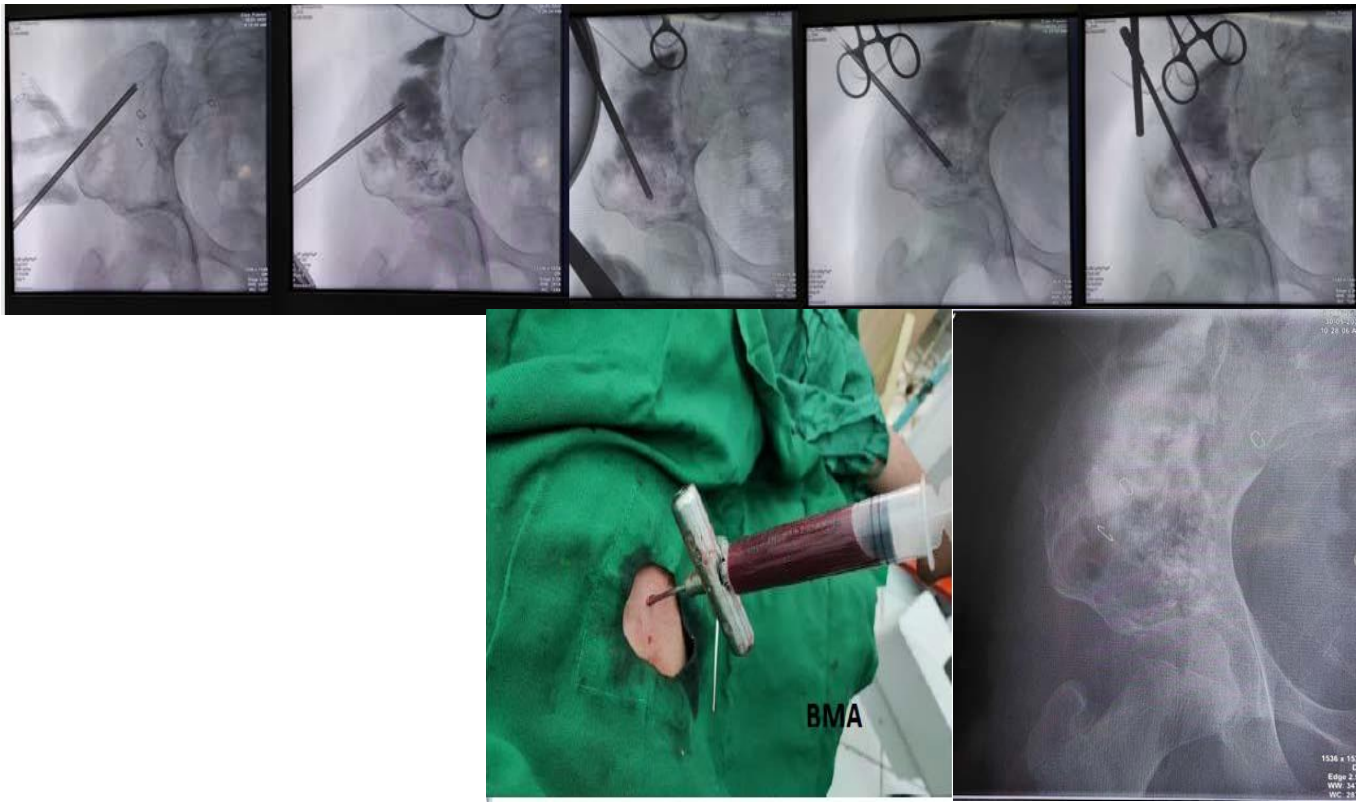

Figure 3. Percutaneous aspiration of the cyst (3 vials of aspirate) and intralesional curettage using trephine needle. A water-based dye was administered prior to introduction of bone substitute, methylprednisolone, and BMA.

Figure 4. Immediate Post operative radiograph

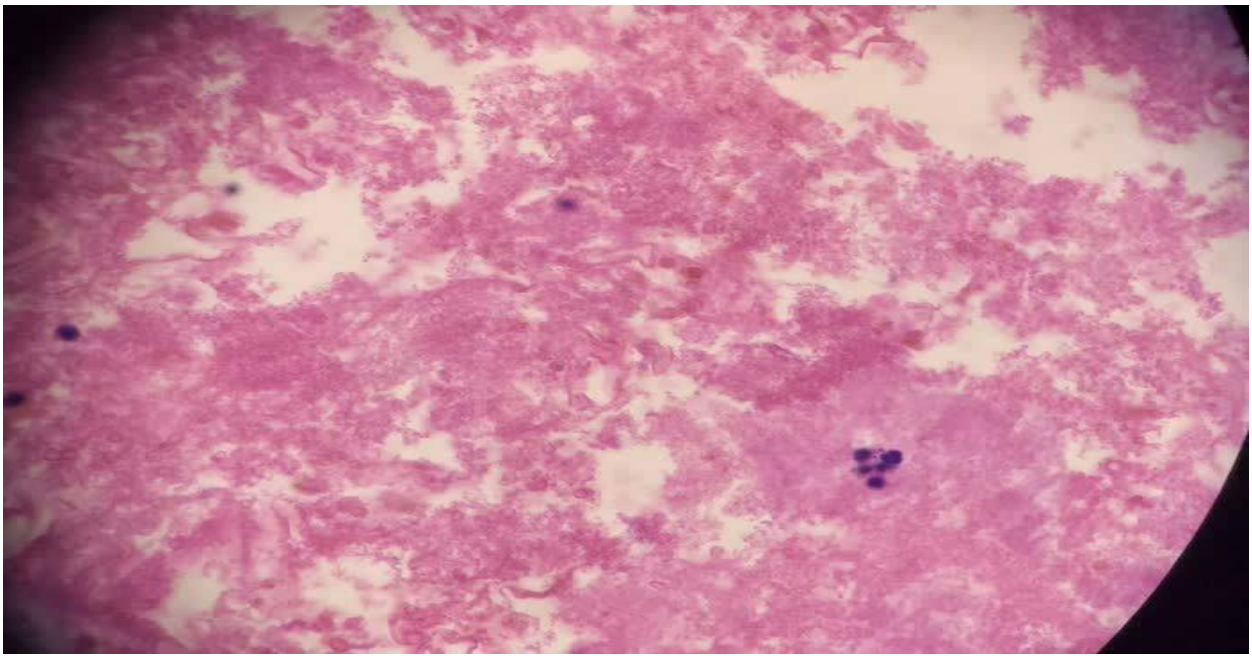

Figure 5. Cell Cytology showing scattered lymphocytes and few neutrophils set against an amorphous and fibrinous background.

Figure 6.A. Two months post op

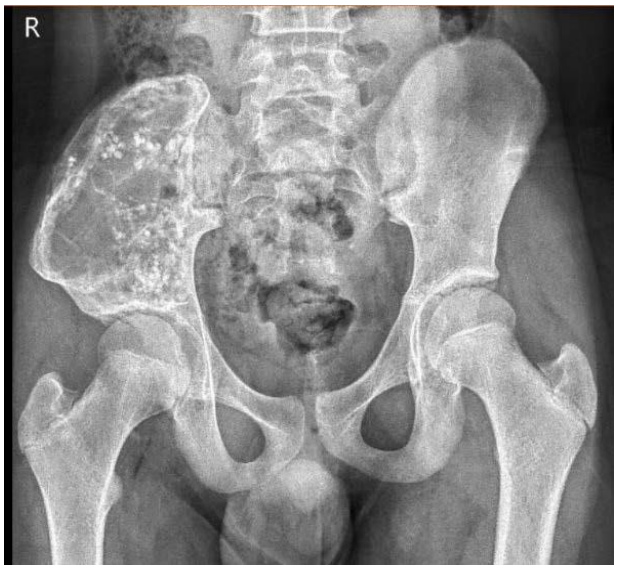

Figure 6.B. Five months post op

Figure 6.C. Seven months post op

Discussion

UBC comprises 3% bone neoplasm, and 85% commonly occurs less than 20 years of age [4]. The precise etiology is unknown, but literature reports that they develop due to a bone growth defect resulting from a fluid filling defect and ultimately thinning and expanding the overlying bone, bone resorption, and exudate retention [5]. Others also suggest that UBC develops due to a venous obstruction within the bone [6].

Pelvis incidence of unicameral bone cysts accounts for two percent of reported cases. It usually occurs during skeletal development in non-weight-bearing portions of the ileum, just adjacent to an open iliac crest apophysis. In addition, Hammoud et al. state that it commonly affects the anterior part of the iliac wing in their study of 16 cases [7].

UBCs are classified as active or latent cysts [8,9]. This cyst has a thin membrane with multiple ridges within the inner surface containing serous or serosanguinous fluid. The cyst tends to arise near the physis and maintain its growth potential when active. During latency, they migrate away from the physis and remain a static bone defect that may gradually resolve over time [9]. Treatment modalities should be tailored to cyst-specific biologic behavior. The goal is to provide pain relief and fracture prevention, dividing into non-operative and operative treatments. A non-surgical approach such as immobilization or observation is recommended when discovered incidentally in asymptomatic patients with no associated substantial decrease in the strength of the affected bone. However, surgical intervention is indicated for symptomatic latent cysts which do not respond to steroid injections, those located proximally in the femur with structural concern and risk for fracture and osteonecrosis, and those with pathologic fracture that need internal fixation for the risk of malunion and refractures [3,9].

A radical resection is an option that reduces the occurrence rate with an increased morbidity and complications rate. Aspiration alone has a more than 50% recurrence rate compared to steroid injections alone or as an adjunct with other treatment modalities [10]. A case report of a novel treatment of these cysts done by Sakamoto et al. consisting of placing screws made from a composite of hydroxyapatite particles and poly L-lactide allowed continuous drainage of the cyst until the former was degraded and was successful during a two-year follow-up. These treatments are between the more conservative immobilization and invasive surgical procedures such as internal fixation [11]. Combining treatments such as intracystic methylprednisolone injection, percutaneous curettage, and autogenous bone grafting may provide high healing rates and rare skeletal malformations [3].

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