CASE REPORT

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A Unique Method for Treatment of Intramedullary Bone Cyst

ABSTRACT

This study presents a novel technique for treating solitary intramedullary bone cysts, particularly focused on using decompression via normal cortex access in the proximal femur, employing flexible reamers for intramedullary nail placement and autologous bone grafting. This method aims to reduce complications associated with traditional surgical approaches, such as neurovascular damage and pathologic fractures. Results indicated a minimally invasive, cost-effective procedure with early patient recovery and no observed recurrence, highlighting its potential applicability in various surgical settings despite the limitation of lacking histological diagnosis confirmation.

Key words: Bone Cysts, Osteoid Osteoma, Fractures.

INTRODUCTION

Solitary bone cysts are benign fluid-filled lesions.[1] Solitary bone cysts appear on radiography as radiolucent lesions with a thinned overlying cortex, which can result in subsequent pathologic fractures.[2]

The exact etiology of solitary bone cysts is unknown, but one hypothesis proposes that the mechanism involves venous obstruction with subsequent elevated intraosseous pressure, leading to cyst formation.[3] These cysts commonly occur in the metaphyseal regions of the long bones, particularly in the proximal femur and the proximal humerus.[2]

The surgical approach to a solitary bone cyst in the meta-diaphysis of the femur also risks neurovascular damage. To avoid the potential complications of fracture and neurovascular damage, we propose the technique of performing decompression via the normal cortex at the proximal femur, using a flexible reamer for placement of an intramedullary nail into the cyst

This study aimed to describe the technique and present the results of intramedullary reaming followed by the use of an autologous bone graft for the treatment of bone cysts in a long bone.

CASE REPORT

A 28-year-old man presented with a 15-month history of left hip pain. The pain was localized and dull-aching in nature, with no aggravating factors. No swelling or stiffness was observed around the joints.

The proximal femur region was tender; however, no swelling or skin changes were observed. The patient had a full active range of movement in the hip, symmetrical to the other side

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Initially, he was treated with non-steroidal anti-inflammatory drugs and physiotherapy, with little improvement. An X-ray revealed a lucent lesion just below the lesser trochanter in the proximal metaphyseal region occupying the shaft of the femur in the proximal extent, following which an MRI was ordered showing a focal well-defined oval lesion within the medullary cavity of the proximal metaphyseal region of the femur, measuring About 4.8×2.6×2.6 mm with minimal overlying thinning of the cortex, displaying characteristics of an osteoid osteoma.

Excision was performed under spinal anaesthesia with the patient in the supine position on a traction table via a 5 cm skin incision several centimetres proximal to the tip of the greater trochanter. This is similar to the one used for proximal femur nailing. The position of the nidus was localized preoperatively from the distance of the greater trochanter.

The patient was placed in the supine position on a fracture table under spinal anaesthesia.

The guide wire was inserted from the greater trochanter area under image intensifier X-ray control

The wire was inserted until a few millimetres proximal to the lesion. The wire position was confirmed in both AP and lateral planes. Initially, the proximal reamer used for nailing was used, followed by curettage.

Subsequently, flexible intramedullary reamers of different sizes were used to ream the medulla under C-arm guidance.

Following reaming, bone grafting was performed to fill the lacunae created by reaming. Bone grafts from the bone bank were used for cancellous grafting and were minced using a bone grinder. An 8 mm funnel and push rod were used to fill the lacuna. The prefilled funnel tube is inserted into the canal and snugly fits into the femur intramedullary canal, preventing graft slippage into the soft tissues during impaction and protecting the surrounding tissues. A round metallic punch with an 8 mm diameter, matching the inner diameter of the graft-passing tube, was introduced into the outer aspect of the tube. The metallic punch is malleted into the tube, pushing the graft into the canal, which is confirmed using an image intensifier to ensure proper filling of the tunnel.

Once the lacuna was filled with the graft, the tube and punch were withdrawn. If more grafts are needed, the same steps are repeated. The tip of the graft tube was plugged with bone wax and reintroduced into the canal. The wounds are washed and closed layer by layer in a standard fashion.

The postoperative period was uneventful, with no surgical site oozing. Rehabilitation involved non-weight-bearing ambulation with a walker from day 1 onwards, and the patient was discharged the next day. Suture removal was performed after 2 weeks, followed by monthly follow-up appointments.

DISCUSSION

The pathogenesis of humeral bone cysts is unclear; hence, there are various treatment approaches. Conservative treatment is often used in clinical practice, such as bone traction, splint, and plaster support after pathological fracture occurs, failing which surgical options are used.

Various treatment options have been reported for simple bone cysts including crushing of the cyst wall and on lay grafting,[6] total resection with bone grafting,[5,6] curettage combined with bone grafting,[3] allografting with freeze-dried crushed cortical bone,[7] total resection with and without bone grafting.[9,10]

However, the initial treatment offered to the patient was simple curettage alone. The success rate of open procedures ranges from 55% to 65%. However, 35%–45% of patients experience recurrence of the cyst, requiring additional open surgical procedures.[4,5-7]

Our method does not require special expensive equipment and is applicable in every surgical unit. Although no recurrence was observed in our case, this technique has been used in a limited number of patients.

Because of the rarity of intramedullary bone cysts, there is a paucity of case reports and series for such patients.

The major drawback of this method and study is the loss of histological confirmation of the diagnosis. Clinical symptoms and radiographic criteria were used for diagnosis in the present study. Other studies of percutaneous coagulation techniques had the same problem too.

CONCLUSION

Our results demonstrated that intramedullary reaming of osteoid osteoma is a minimally invasive, safe, simple, and cost – effective procedure. This method allows an early return to weight bearing and recreational activities and avoids the potential complications of extensive surgeries

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