Use Of Deep Freezeed Allogenic Bone Graft In Management Of Proximal Humerus Cystic Lesion With Pathological Fracture.

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Abstract

Pathological fractures do commonly follow cystic lesions of humerus such as unicameral bone cyst and aneurysmal bone cyst. Proximal humerus is the most common site for unicameral bone cyst with 85% of cases occurring in the first two decades of life of which 2/3rd of patients presenting with pathological fracture. Aneurysmal bone cysts are locally destructive blood-filled reactive lesions of bones which account for about 1% of all biopsied tumours and tumour-like lesions of bone and most commonly affect proximal humerus, distal femur, proximal tibia and spine.

Various treatment options for unicameral bone cyst range from steroid injections for smaller lesions to aspiration and curettage (with or without bone grafting and internal fixation) for lesions associated with pathological fractures. Bone graft substitutes such as calcium sulphate and high porosity hydroxyapatite have also been used in place of auto or allogenic bone graft. However these are costly and lack any osteogenic potential. On the contrary, Aneurysmal bone cysts can be managed using curettage and bone grafting.

We successfully treated a case of proximal humerus cystic lesion associated with a pathological fracture using deep freezed allogenic bone grafting and internal fixation using titanium expandable nailing system. On follow-up of 4 weeks patient had satisfactory fracture union and range of motion.

Case report

A 16 year old boy presented with chief complaints of pain over right upper arm and inability to move it. Pain of moderate intensity had been present for around 2 months at the right upper arm which suddenly increased one day back on lifting a heavy object with the same arm. On general physical examination patient had adequate built and nutritional status for his age with no cyanosis, icterus, pallor, lymphadenopathy and pedal oedema. On inspection, no abnormal swelling or deformity was present. On palpation local bony tenderness, bony irregularity and crepitus was present over right proximal humerus. Range of motion was restricted and painful at the right shoulder joint. Plain radiographs of right humerus revealed expansile lytic lesion of size 2x2 cm with well-defined margins present eccentrically in the metaphysis of proximal third of humerus alongwith transverse fracture line running near the cystic lesion. Laboratory evaluation which included complete blood counts with peripheral smear, ESR, serum electrolyte with calcium and phosphate, serum albumin and globulin, renal function test, hepatic function tests, urinalysis, serum and urine protein electrophoresis, parathyroid hormone all came out to be within normal
limits. Patient was planned for curettage and bone grafting. On table, the image intensifier showed some displacement of the humeral fracture which warranted internal fixation. The patient was taken supine under general anaesthesia and titanium expandable nail was inserted from the usual entry portal for proximal humerus (just lateral to the articular surface of the humerus head and just medial to the greater tuberosity). The nail under the control of image intensifier was extended till the cavity of the bony cyst and then an infant feeding tube was loaded over the nail to aspirate out the contents of the cyst which were sent for tissue analysis. Then a larger catheter was loaded after removing the infant feeding tube through which thorough curettage of the bone cyst was carried out and morselized deed-frozen allogenic bone graft was placed in the cyst cavity through the same catheter. The titanium expandable nail was then extended through the fracture site and adequate reduction was achieved. Immediate post operative radiograph revealed adequate filling of the cystic space and reduction of associated humerus fracture. Biopsy report confirmed the cyst to be aneurismal bone cyst. On the follow-up subsequent radiograph and CT scan revealed satisfactory graft uptake and fracture union. The patient was able to attain full range of motion at both the shoulder and elbow joint post operatively at six weeks following standard physiotherapy.

Discussion and conclusion

Cystic bone lesions in the first two decades of life constitute common cause for pathological fractures. Two most important differential diagnosis of cystic lesions in children include unicameral bone cyst and aneurysmal bone cyst. Treatment options for unicameral bone cyst include aspiration and curettage, steroid injections and filling of the cyst cavity with bone grafts and its substitutes such as calcium sulphate and high porosity hydroxyapatite. But for unicameral bone cysts associated with pathological fracture curettage and bone grafting with internal fixation is considered as standard management. For aneurysmal bone cyst treatment options are limited with curettage and bone grafting with allogenic bone graft shown to be effective with obvious need for internal fixation if associated pathologic fracture is present with this case report confirming the same.

References
Illustrations

Illustration 1
Skiagram showing a metaphyseal lytic lesion extending up to diaphysis associated with pathological fracture

Illustration 2
Post operative skiagram showing treated cystic lesion with obliteration of the cystic cavity and TENS nail in situ
Illustration 3

2 months post operative skiagram showing healing of the cystic lesion