Case report 2

Chondrosarcoma of the Proximal femur treated by resection and Total Hip Arthroplasty.

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Introduction

Chondrosarcomas are the second most common primary malignant bone tumors after osteosarcoma, with heterogeneous clinical, radiological, and histological features(1). Chondrosarcoma is an aggressive malignant tumor of bone with pure hyaline cartilage differentiation. It can present in adults from the third to eight decades, peaking between 40 and 70 years of age, and men are affected more often than women(2).

The commoner central and peripheral types constitute the largest subgroups; rarer subtypes include mesenchymal, periosteal, clear cell, and de-defferentiatiated chondrosarcomas. More than 90% of chondrosarcomas are primary [arising from previously normal bone] while secondary chondrosarcoma arises in pre-existing osteosarcoma including Ollier's disease or Maffucci's syndrome(1).

In this case report, we have presented our Sri Lankan experience in managing chondrosarcoma of the proximal femur with extensive wide local excision and Total hip arthroplasty using a diaphyseal fixation implant.

Case presentation

A 47-year-old female housewife with no co-morbidities and no family history of cancer, presented with a large painful lump involving the right upper thigh and lower gluteal region for a six-month duration. It was progressively increasing in size for the initial two months, however, it shows rapid enlargement in the last four months. She had night pain but he denied any history of trauma, fever, numbness, and weakness of the lower limb.

Physical examination revealed a large elongated [29cm x 16cm] lump without any ulceration in the overlying skin and firm consistency.

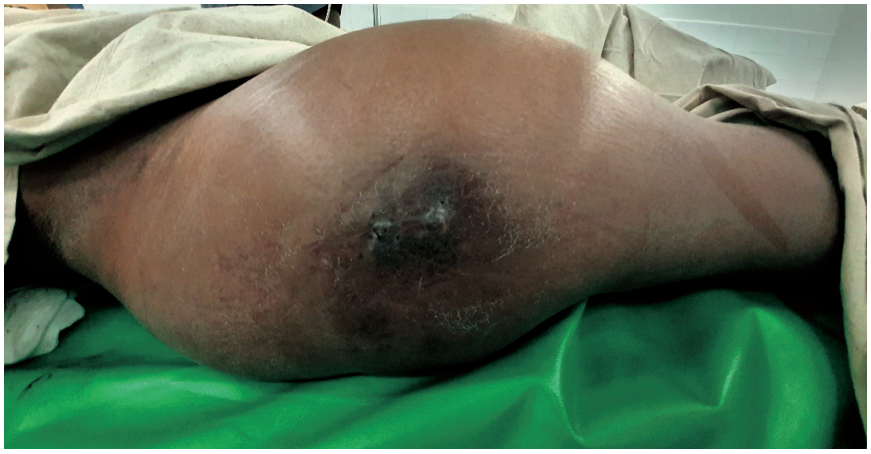

***Figure 4** - Shows lump involving in the right gluteal region and upper thigh.*

Biochemical and hematological investigations were within normal limits except ESR 95mm/hr. Her Xray of bilateral hip and proximal femur anteroposterior view revealed a large, intraosseous, osteolytic lesion with a narrow zone of transition and irregular granular calcifications

within the matrix described as honeycomb or popcorn sign [fig.2.] contrast-enhanced computer tomography [CECT] of chest, abdomen, and pelvis were not revealed any abnormalities.

CECT of the right thigh revealed destructive bony lesion involved right proximal femoral head, greater trochanter, neck, and proximal shaft. The bony lesion is associated with multiple septated solid and cystic soft tissue mass measured 28cm x 15.5cm x 10cm [fig.3].

Magnetic resonance image [MRI] of the right thigh revealed a large bony destructive bony lesion arising from the right femur head, neck, and proximal shaft. The tumor is not involved the acetabulum of the pelvis. The tumor extending up to 16cm from the head of the femur. The vascular compartment is displaced anteromedially however no vascular invasion or encasement. [fig.3]

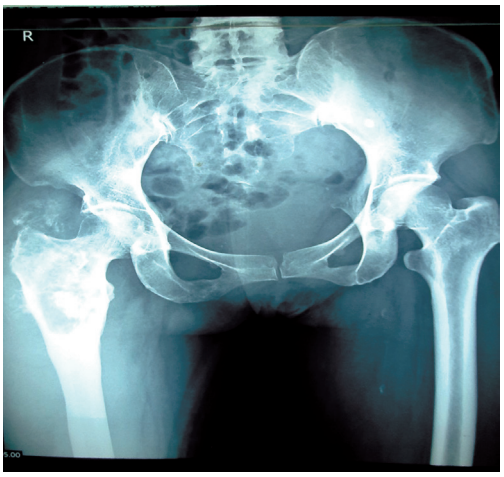

Fig. 2. : *Shows an anteroposterior view of the bilateral hip joint and proximal femur radiograph, which revealed intraosseous, osteolytic lesion with a narrow zone of transition and irregular granular calcifications within the matrix described as honeycomb or popcorn sign in the right proximal femur.*

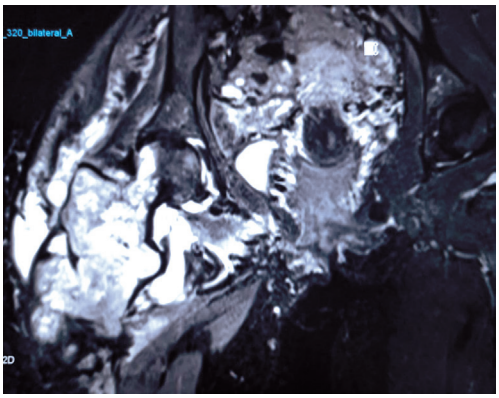

Fig 3. : *Shows MRI of right thigh coronal section*

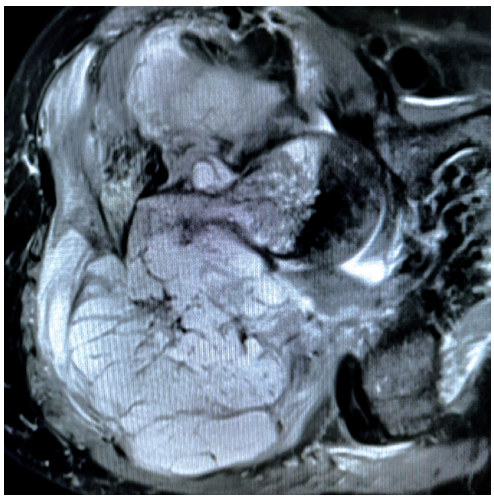

Fig 4. : *Shows MRI of right thigh axial section shows tumor involved the soft tissue around the femur shaft and proximal femur.*

Incision biopsy was arranged following a discussion with a multi-disciplinary team, under subarachnoid block. It shows grade 1 chondrosarcoma.

The treatment opted for this patient was wide local excision and total hip arthroplasty using a diaphyseal fixation implant. The indexed surgery was performed by an experienced orthopedic surgeon. Wide local excision of the malignant tumor and the hip reconstruction were carried out in a single session.

The procedure was explained and informed written consent was obtained. She underwent routine preoperative assessment. The patient was given a subarachnoid block and she was placed in the left lateral decubitus position. The posterior approach was used with a long curvilinear incision that reached the soft tissue tumor part. Meticulous soft tissue dissection made, and soft tissue tumor part entered the vastus intermedius and vastus lateralis muscles were resected out owing to tumor infiltration. The muscles that are attached to the proximal femur and midshaft periosteum are resected out. Wide local excision of tumor performed by dislocation of the femoral head and femur shaft resection at 21cm from the head of the femur according to the preoperative templating.

The acetabulum was prepared routinely to fix the acetabular component. The femoral canal was prepared by reaming to insert the long Wagner stem (Wagner SL revision® hip system, 265mm × and additionally supported by cerclage wires. After the reduction of the femoral component, stability was checked and routine closure done drain kept in.

Postoperative antibiotics and prophylaxis of deep vein thrombosis were given and the intravenous antibiotics were continued for one week postoperatively.

The patient was mobilized in the bed on the first day of post-op. After five days the patient was instructed to touch toe weight-bearing with direct supervision and care of a physiotherapist. The patient was discharged successfully on the 10th day of post-op.

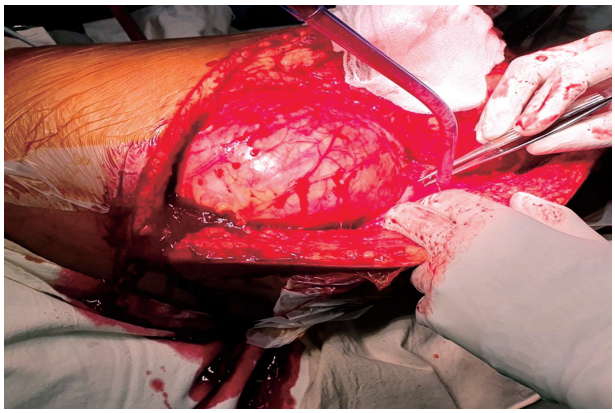

Figure 5: *shows the intra operative picture of the tumor during excision*

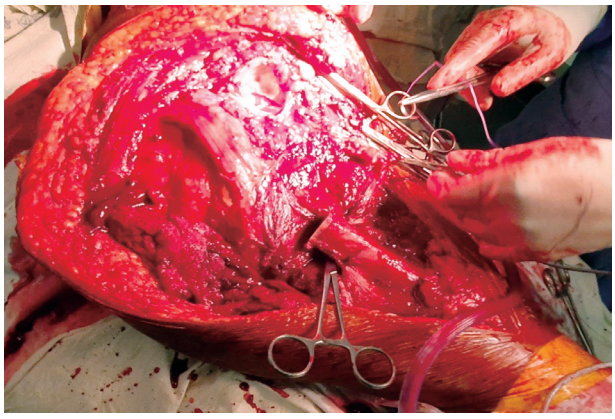

Figure 6: *shows the intra operative view following the wide local excision*

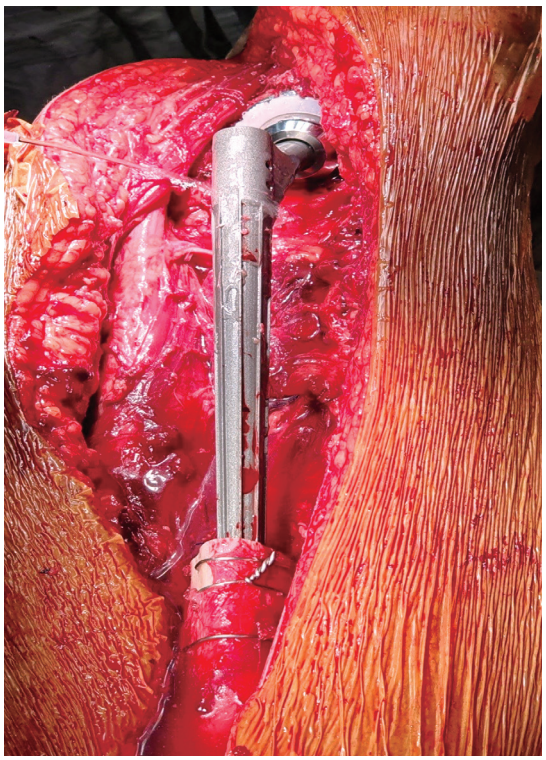

Figure 7: *shows the intra operative view following the hip reconstruction*

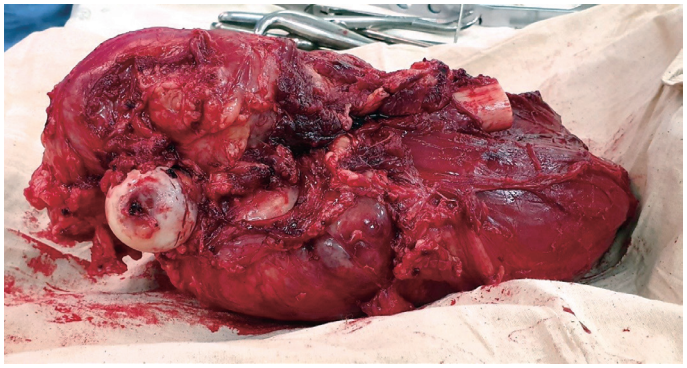

Figure 8: *shows the excised tumor with involved soft tissue*

Fig:9 *: shows postoperative anteroposterior radiograph and lateral radiograph of femoral and acetabular component of hip reconstruction.*

Discussion.

Chondrosarcoma is a pure hyaline cartilaginous origin rare malignant tumor of the bone. Chondrosarcoma shows a heterogenous group of lesions and a wide range of morphological and clinical behavior.

The chondrosarcoma can be classified according to histological type, origin, and site.

Histological:- conventional, clear cell, mesenchymal, dedifferentiated

Origin:- primary or secondary

Site:- central or appendicular

Macroscopic features of chondrosarcoma of a cut section are translucent, bluish-grey glistening cut surfaces with a lobular pattern. There will be areas of myxoid or mucoid material and cystic degenerations and some amounts of calcium deposition. The histology shows lobules of hyaline cartilage are separated by fibrous septae, which shows a permeative growth involving lamellar bone indicative of a rapidly growing malignant tumor. This permeative growth pattern is the differential factor between chondroma and chondrosarcoma(1).

The lobules of chondrosarcoma contain hypercellular, atypical, and hyperchromatic chondrocytes. Necrosis and mitoses can be seen in high-grade chondrosarcoma.

Chondrosarcoma can be divided into grades histologically based on the factors of cellularity, cytological atypia, chromasia, and mitotic features.

Grade 1:- (low-grade) are moderately cellular and nuclei are hyperchromatic and abundant chondroid matrix

Grade 11:- more cellular and nuclear atypia and hyperchromasia, mitoses are present.

Grade 111:- (high-grade) hypercellular with nuclear pleomorphism and frequent mitoses.

The histological grading has good guidance for best treatment and clear prognostic value. The survival rate was 89% for Grade 1, 53 % for Grade 11, 38% for Grade 111(3).

The management of chondrosarcoma is a multidisciplinary approach that involves orthopedic surgeons, a radiologist, and Histopathologist. The primary option of the treatment is surgical resection; radiotherapy and chemotherapy have not shown any benefit except for palliative purposes.

After the radiological investigation such as contrast-enhanced computer tomography and magnetic resonance image, the biopsy should be planned to be performed in line with a subsequent resection approach, because these lesions have a definitive potential of recurring in a biopsy track.

The treatment of low-grade tumors depends on the location. The low-grade appendicular tumors can be treated by aggressive curettage plus or minus cement or cryotherapy.

The treatment of grade 11 and grade 111 tumors should undergo surgical resection with wide surgical margins. The intralesional curettage is not recommended because of high rates of local recurrence and metastasis.

The chondrosarcomas are radio and chemo-resistant. Recent studies show the Alendronate has shown anti-proliferative effects on cartilaginous cells(4). Carbon ion therapy has been reserved for non-operable cases or difficult locations. The carbon ion therapy has a high cell mortality rate than photon therapy for the same physical total dose given(5).The recent study shows the effect of selective cox-2 inhibition on chondrosarcoma growth(6).

In this patient, even though the tumor is grade 1, it shows large soft tissue involvement and cortical bone involvement. So we decided to go for wide local excision of the tumor and followed by hip joint reconstruction.

Conclusion.

Chondrosarcoma is an aggressive malignant tumor. For many decades, disarticulation of the hip joint was the method of choice for proximal femoral tumors. A great deal of attention has focused on malignant bone tumors. Nowadays proximal femoral tumor resection with total hip arthroplasty with long femoral stem or endoprosthetic replacement is the most commonly used treatment method.

Data availability.

The data used to support the findings of this case study are included in this article.

Consent.

Informed written consent was obtained from the patient for publication.

Conflict of interest.

All authors declare that they have no conflicts of interest.

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