



Management of Pathological Fracture Neck of Femur With Total Hip Arthroplasty and Composite Allografting

KEYWORDS

giant cell tumour, curettage, bone graft, allograft

Dr. Satish Kumar C

Professor in the department of Orthopaedics, Vydehi institute of medical sciences and research centre (VIMS&RC), Bangalore

Dr. Karthik. M.N

Assistant Professor in the department of Orthopaedics, Vydehi institute of medical sciences and research centre (VIMS&RC), Bangalore

Dr. Praneeth Revuri

Assistant Professor in the department of Orthopaedics, Vydehi institute of medical sciences and research centre (VIMS&RC), Bangalore

ABSTRACT **INTRODUCTION** – Giant Cell Tumour also called Osteoclastoma of bone is the commonest bone tumour encountered by an Orthopaedic surgeon.

The incidence of GCT is 30% of all bone tumours. GCT generally occurs in skeletally mature individuals with peak incidence in the third decade of life. Less than 5% are found in patients with open physis and only about 10% of cases occur in patients older than 65 years, we present a case of proximal femur Giant Cell Tumour with pathological fracture neck of femur managed with composite Allografting and reconstruction arthroplasty in a 35 year male patient.

CASE REPORT –

INTRODUCTION –

A 35 years old male came with chief complaints of swelling and pain in the left hip since 6 months. Pain increased since 1 month. The swelling was insidious in onset and gradually progressive in nature. The pain was acute in onset and progressive in nature, dull aching in character, radiating to left lower limb and severe in intensity so that patient was not able to bear weight on the affected limb at the time of presentation. There was no history of trauma to the affected hip.

Radiologically an osteolytic lesion involving the metaphysis and head of proximal femur. Core needle biopsy was done through a lateral approach. On the basis of biopsy report and the MRI, the diagnosis of Giant Cell Tumour of Proximal neck and head of femur was made. Patient was advised for surgery, but was not willing for surgery hence has been discharged under advice of strict non weight bearing ambulation.

Patient returned back after one year with complaints of acute pain in the Left Hip, severe in intensity and not able to bear weight. Radiography revealed to have pathological fracture neck of femur on the affected side. Hence patient was planned for wide excision of the tumour and allografting with custom mega prosthetic arthroplasty.

PROCEDURE –

Pre operatively, the tumour length and its extension were measured and allograft was ordered. Allograft of about 15cms (distal tibia) was procured from Bone bank (M.S.R.H&RC Bangalore). Modular distal loading stem implants were ordered for the surgery.

Patient in right lateral position under spinal anaesthesia, under aseptic conditions, parts painted and draped. Skin incision of about 15 cms made along the posterolateral approach, subcutaneous tissue separated and abductor muscles were cut and tagged, after internal rotation the

short external rotators were identified, tagged and cut, capsule incised in inverted T fashion, fracture site exposed, Up to 7 cms below the level of lesser trochanter was marked and excised along with the head and the whole specimen was sent for biopsy, the processed allograft (distal tibia) was soaked in gentamycin and normal saline and then prepared. Required size of tibial graft was cut in accordance to simulate the proximal femur with greater trochanter of femur. The allograft was serially reamed along with femoral shaft.

Distal load bearing femoral component had following components – Distal load bearing stem, neck component, offset and femoral head.

In this surgery uncemented distal load bearing stem along with neck component were inserted in to femoral shaft via prepared allograft.

Acetabular cup was reamed and cemented acetabular cup was fixed to the same. Later neck component of 10mm size and -4 offset of head was inserted, with controlled traction the femoral head was reduced in to the acetabular cup and checked for the stability.

Multiple drill holes made on to the new greater trochanter (i.e., medial malleolus of the tibial allograft) was made and abductors were sutured using ethibond. The short external rotators were sutured back, vastus lateralis, fascia lata and IT band sutured and wound closed in layers after placing the drain and sterile dressing was done.

POST OPERATIVE PERIOD –

Since blood loss of about 500 – 700 ml was expected, 2 pints of packed cells along with fluids were transfused. IV antibiotic coverage for 10 days. Static quadriceps exercises along with ankle movements were encouraged from post op day 2. Drain removal done by 3rd post op day. Suture removal done on post op day 13. post op xray was checked and accepted. Patient was made to ambulate non

weight bearing initially and gradual weight bearing done. At present patient ambulates with complete weight bearing without any walking aid.

2cms of limb lengthening was the only complication we encountered and was compensated by foot rise on the opposite limb.

DISCUSSION –

The problem of selecting the proper treatment in GCT is complicated by the failure of its histological and radiological appearance to indicate its biologic behavior. The management of juxta-articular giant cell tumors around the hip occurring in young patients continues to be one of the most challenging areas in orthopedic oncology.

Enneking's and Campanacci's radiographic classifications and surgical staging are helpful in planning the initial surgical treatment, as a number of the active (Stage 2) lesions and most of the aggressive (Stage 3) lesions have a higher incidence of local recurrence (20-50%) when treated by curettage with or without bone grafting.

The continued followup and analysis of this technique should be encouraged to refine and develop the management of massive proximal femoral bone loss. This review demonstrates that proximal femoral allografts for revision hip arthroplasty in femoral segmental bone loss do provide a durable solution, with current available evidence reporting a survivorship of 80%. Whilst a range of surgical techniques have been described, the study highlights the following:

1. uncemented distal fixation is associated with a reduced the risk of aseptic loosening or fracture,
2. if available, using the host femur as an onlay graft enhances hip stability whilst acting as a vascularised graft.¹

The perceived benefits of the composite technique may accrue only to a few patients, partly owing to the risk of mechanical complications. Although these can be reduced by avoiding the use of cement in the host femur, the generally poor functional outcomes suggest that this technique needs to be studied further in this group of patients and compared with other reconstructive techniques, particularly the prosthetic implant.²

Both procedures provided good functional outcome in the long-term follow-up, gait analysis revealed mechanical changes during gait that were probably related to the muscle reinsertion procedure. Direct fixation of the muscles to the bone graft appeared to result in a more efficient muscular recovery.³

CONCLUSION –

By using the technique of Limb Salvage by composite allografting and reconstruction arthroplasty we have achieved satisfactory oncological and functional outcomes in our patient.



XRAY OF PELVIS SHOWING GIANT CELL TUMOUR OF HEAD,NECK AND TROCHANTER OF LEFT FEMUR



XRAY OF PELVIS SHOWING PATHOLOGICAL FRACTURE NECK OF FEMUR



PHOTOGRAPH SHOWING POSTEROLATERAL APPROACH TO THE HIP JOINT

PHOTOGRAPH SHOWING ALLOGRAFT INCORPORATION WITH LONG MODULAR STEM



RADIOGRAPH SHOWING IMMEDIATE POSTOPERATIVE LEFT HIP WITH ALLOGRAFT AND IMPLANT INSITU



PHOTOGRAPH SHOWING RANGE OF MOVEMENT AFTER SIX WEEKS POSTOP



PHOTOGRAPH SHOWING PATIENT WITH COMPLETE WEIGHT BEARING AFTER SIX WEEKS POSTOP



PHOTOGRAPH SHOWING DISTAL TIBIA ALLOGRAFT PREPARATION



PHOTOGRAPH SHOWING EXCISED NECK AND HEAD OF FEMUR



References –

1. B.A.Rogers,A.Sternheim,D.Backstein,O.Safir,andA.E.Gross Department of Orthopaedic Surgery, Mount Sinai Hospital, Toronto, ON, Canada M5G 1X5. "Proximal Femoral Allograft for Major Segmental Femoral Bone Loss: A Systematic Literature Review", SAGE-Hindawi Access to Research Advances in Orthopedics Volume 2011, Article ID 257572, 7 pages doi:10.4061/2011/257572Received 27 March 2011; Revised 16 June 2011; Accepted 7 July 2011"
2. Bruce M. McGoveran, MD;* Aileen M. Davis, BScPT, MSc, PhD;† Allan E. Gross, MD;‡ Robert S. Bell, MD "EVALUATION OF THE ALLOGRAFT-PROSTHESIS COMPOSITE TECHNIQUE FOR PROXIMAL FEMORAL RECONSTRUCTION AFTER RESECTION OF A PRIMARY BONE TUMOUR",CJS, Vol. 42, No. 1, February 1999
3. Maria Grazia Benedetti, Enrica Bonatti, Calogero Malfitano and Davide Donati, "Comparison of allograft-prosthetic composite reconstruction and modular prosthetic replacement in proximal femur bone tumors", Acta Orthopaedica 2013; 84 (2): 218–223
4. Abolhasan Borjian, Khalil Nazem, Hadi Yassine, "Complications of massive allograft reconstruction for bone tumors", JRMS 2006; 11(4): 240-247
5. S.K. Nandi, S. Roy, P. Mukherjee, B. Kundu D.K. De & D. Basu, "Orthopaedic applications of bone graft & graft substitutes: a review", Indian J Med Res 132, July 2010, pp 15-30
6. David J. Biau MD, Frederique Larousserie MD,Fabrice The venin MD, Sophie Piperno-Neumann MD,Philippe Anract MD, "Results of 32 Allograft-prosthesis Composite Reconstructions of the Proximal Femur", Received: 10 January 2009 / Accepted: 24 September 2009 / Published online: 23 October 2009_ The Association of Bone and Joint Surgeons1 2009, Clin Orthop Relat Res (2010) 468:834–845.