



Orthopaedics

A RARE CASE REPORT OF GCT DISTAL END OF RADIUS MANAGED BY EN BLOC EXCISION & ARTHRODESIS WITH IPSILATERAL FIBULAR AUTOGRAFT

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ABSTRACT GCT of distal end of Radius is a locally benign aggressive tumor & it is commonly managed by extended curettage & adjuvant therapy, which nearly nullifies recurrence risk. Juxta-articular distal end of radius GCT is challenging because of its destruction to the articular cartilage & subchondral bone, which makes it difficult to salvage the joint congruency and its functions. Since there is no definitive protocol for the treatment of managing GCT; we went through various treatment option modalities include wide resection and reconstruction of allograft, wrist arthrodesis with fibular graft or ulnar translocation with wrist arthrodesis, but all this treatment option has its own merits and demerits. This is a case report of 57 yrs old male came with chief complaints of swelling and pain over left wrist of 5 months duration and difficulty in moving the wrist joint. Clinically pain & swelling are insidious in onset and gradually progressive in nature. Radiologically shows expansile lytic lesion extending to subarticular region with cortical thinning and breach noted in dorsal & volar aspects noted. Biopsy was done & eventually turned out giant cell tumor. Patient was planned for En block excision of the tumor with bone grafting (non-vascularized, ipsilateral fibular autograft & iliac crest bone graft) & wrist arthrodesis. At end of two years of follow-up, the patient exhibits no evidence of recurrences, pain free wrist and able to perform his day-to-day activity without any difficulty.

KEYWORDS : Giant cell tumor, Arthrodesis, Fibular autograft, Distal radius, En Block Excision.

INTRODUCTION:

GCT of the distal end of Radius is a locally benign aggressive tumor of bone composite with ovoid, mono-nucleated cells with sheets of neoplastic cells (Osteoclast-like giant cells). GCT constitutes around 4-5% of all primary bone tumors & 20% of all benign bone lesions¹. The incidence peak at the age (20 - 45) yrs, whereas seventy percentages of the cases falls under between these age groups. GCT most commonly affects the ends of the long bones². The distal end of femur, proximal end of tibia, distal end of radius & proximal part of humerus are sites commonly affected in the appendicular skeleton³. In axial skeleton sacral bone is widely affected. Distal end of radius plays a pivot role in radio-carpal joint articulation & functions of the hand⁴. Due to its complex anatomy, hence it is very difficult to reconstruct the lost anatomy caused after tumor resection and to achieve necessary functional outcomes⁵. Various options of treatment proposed in literature, include (I) Extended curettage (with / without) reconstruction using autogenous bone grafts; (II) Resection & reconstruction with proximal fibula (vascularized / non-vascularized); (III) Resection of tumor with partial arthrodesis with a strut bone graft; (IV) Resection with complete wrist arthrodesis with intervening strut bone graft.

CASE REPORT:

PRE-OP CLINICAL IMAGING



FIG 1 (A)

FIG 1 (B)

FIG 1 (C)

This is a case report of 57 yrs old male patient came to our OPD with chief C/o left wrist swelling & pain of 5 months duration and difficulty

in moving the wrist since 20 days. The pain was insidious in onset and gradually progressive, continuous dull aching type, aggravated on movement, non-radiating pain. The swelling was insidious in onset, progressive in nature associated with pain. Activities of daily living of the patient were affected. Patient was unable to grip and lift objects due to pain. No H/O fall/trauma fever, loss of weight, loss of appetite, night pain, night cries. On local examination Diffuse swelling & Tenderness over both the dorsal and volar aspect of the distal 1/3rd of forearm, Hyperpigmentation noted over the distal forearm, No obvious deformity, No warmth & visible pulsations, Firm to Hard in consistency, immobile. Skin over the swelling is pinchable. ROM: restricted associated with pain & spasm.

- Firm swelling of size 3.2 X 3.1 CM

RADIOGRAPHIC INVESTIGATIONS:



Fig (2): X-RAY Of Distal End Of Radius

- Showing expansile lytic lesion present in the distal end of Radius subarticular extension with cortical thinning. Few septations noted. Breach in dorsal and volar aspects noted.

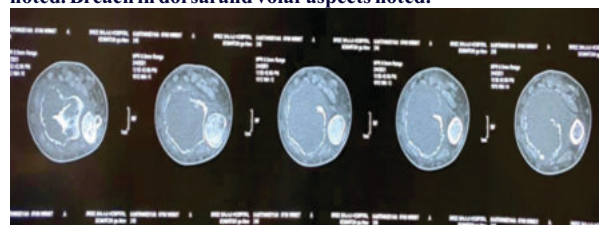


Fig 3 – CT - Scan (AXIAL-VIEW) Showing Breach Of Cortex

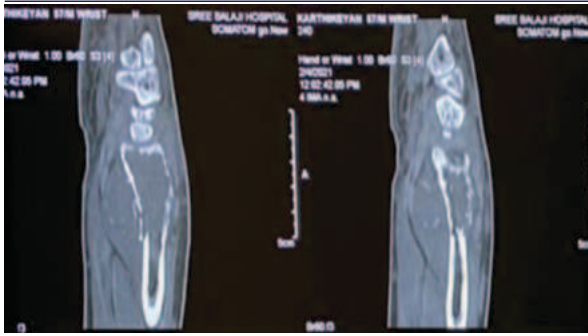


Fig (4) – CT SCAN Shows Breach and destruction of cortex.



Figure (5) – 3D CT Reconstruction

- 3D CT SHOWS EXPANSILE HETEROGENEOUS LESION WITH IRREGULAR MARGINS MEASURING 3.2 X 3.1CM IN THE DISTAL END OF RADIUS.

MRI shows Destructive hetero intense lesion measuring 35X25 mm seen in the distal end of radius at epi metaphyseal region. The lesion is seen causing significant expansion along the ventral aspect with cortex destruction & associated ventral soft tissue component measuring approximately 25X15mm.

Minimal break in the articular soft tissue component. Bony lesion shows intermediate signal change in T1 and T2 - weighted images. Exophytic soft tissue component seen involving Pronator quadratus muscle with perilesional oedema.

Biopsy was done to confirm the diagnosis and sent for Histopathological examination Features were consistent with radiological diagnosis of GCT.



Fig 6 – POST–OP X-RAY

Patient underwent EN-BLOC EXCISION OF THE TUMOUR WITH BONE GRAFTING (NON VASCULARIZED, IPSILATERAL FIBULAR AUTOGRAFT & ILIAC CREST BONE GRAFT) AND WRIST ARTHRODESIS. Anaesthesia- GA, Position- Supine with left upper limb in extension board. Through Posterolateral approach 10cm incision was made over the fibula 15cms above the lateral

malleolus. A Fibular graft of 7cm was taken. left iliac crest and cancellous bone graft was harvested. Through dorsal approach, an incision was made extending from head of 3rd metacarpal to distal 1/3rd radius Interval made b/w 3rd & 4th extensor compartment. Distal radius was visualized. Resection of tumor was done. Sample was sent for HPE. Fibular graft was placed in the defect and fixed with 14 holed DCP through Proximal radius, graft and 3rd MC. Luno-capitate fusion was done using 20mm screw apart from the plate. wrist joint in 15 degree dorsiflexion. Gap was filled with cancellous bone graft. Thorough wound wash was given. Drain kept in situ.



FIG (7)



FIG (8)

HPE of Specimen shows PTINx GCT of left distal end of radius. Intermediate grade, locally aggressive, non metastatic, margins cannot be assessed.

Post-operative Two Years Follow-up, X-rays And Clinical Functional Out Come Follow-up Pictures - (fig – 10,11 & 12).



Fig - 10



Fig - 11



Fig - 12

DISCUSSION:

GCT of the distal end of Radius is a locally benign aggressive tumor and its intra-lesional excision curettage has high recurrence rate⁶. Various literature suggest that GCT of distal end of radius are unpredictable, aggressive and metastasizes often to distant organs, mostly to the lungs.⁷ The idea of excision of the tumor and its post-reconstruction functional difficulties must be minded, when planning wide-local excision for prevention of recurrence⁸. Patients those who underwent intra-lesional extended curettage without sufficient subchondral bone residual support had secondary collapse of the joint and along with high recurrence of degenerative osteoarthritis⁹.

Various treatment modalities are available which include En-block tumor resection & reconstruction with ipsi-lateral fibular auto-graft (vascularized or non-vascularized), tri-cortical iliac bone graft, structural allo-grafts, distal-ulnar centralization, etc¹⁰. Whereas reconstruction using non-vascularized fibular auto-graft is suggested & used predominantly in literature successfully.¹¹

The reason for choosing arthrodesis in this patient are Patient desired a single stage definitive treatment, Patient required a stable and painless wrist which would allow him to resume physical activities as he is a daily wage laborer, Patient also requested an economically feasible treatment option. There are also 30-35% high chance of joint subluxation and chance early wrist arthritis in wrist arthroplasty procedure¹². Hence EN-BLOC tumor Excision with bone grafting (non-vascularized, ipsilateral fibular autograft & iliac crest bone graft) and wrist arthrodesis was preferred.¹³

In our case report patient after 2 yrs of follow-up shows no pain, excellent union and grip strength. Patient able to get back to his routine work and able to perform his day to day activities without any difficulties¹⁴. The wrist range of motion is limited due to arthrodesis. Whereas DASH score showed minimal disability to our patient¹⁵.

CONCLUSION:

Autogenous non-vascularized fibular graft reconstruction can be considered as a treatment option after En block resection of GCT in the distal end of radius as it shows good union, pain relief, less chance of recurrences & subluxation and good functional outcome.

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