Phaco-reduction (Surgical Phocomelia) as a method of reconstruction after resection of sarcoma of the humerus: a suitable option for reconstruction in cases of extensive involvement of the bone

Limb Salvage: The Standard Treatment

The humerus: one of the frequent sites for occurrence of bone sarcoma in pediatric patients

Reconstruction with one of several methods of reconstruction available

- Wide Resection of Tumor
- Endoprosthetic Reconstruction
- K-Nail Bone Cement Spacer
- Tumor Sterilization and Fixation
- More extensive involvement of humerus: options of reconstruction expanded

What if the humerus is even more extensively involved and none of these reconstruction methods are feasible? ???

Amputation

Limb salvage: Phaco-reduction (Surgical Phocomelia)

References:


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Segmental Resection and Replantation
A viable option for advanced sarcomas in the upper limb¹

Surgical Phocomelia or Phoco-reduction:

- **a.** Shortening of the upper limb – patient acceptance level is satisfactory
- **b.** Salvaged upper limb can be used by the patient to perform certain activities of daily living
- **c.** Avoidance of amputation

**Case 1**
- 4 years female with Ewing sarcoma humerus with extensive involvement

**None of the usual methods of resection feasible after resection of the tumor**
- Resected tumor which includes the skin – Resection of a segment of the arm

**Carefully planned skin incision so that after removal of tumor along with skin (segment of arm) good wound closure is achieved**

**Case 2**
- 14 years female with Ewing sarcoma humerus with extensive involvement

**None of the usual methods of resection feasible after resection of the tumor**
- Resected tumor which includes the skin – Resection of a segment of the arm

**Carefully planned incision to include the skin along with the resected tumor**

Fungating malignant tumors: amputation is undertaken in almost all cases. However, if phoco-reduction is undertaken: Fungating portion of the tumor can be included in the resected tumor segment along with the skin.

Case 3

17 years male with Fungating Synovial Sarcoma of the Elbow

Tumorous arm segment removed along with the fungating portion with preservation of neurovascular bundle

Resected tumor which includes the skin along with the fungating portion – Resection of a segment of the arm

Follow-up at 5 months – union between humerus and ulna

Wound healed and patient able to position hand in space well
Phoco-reduction (Surgical Phocomelia) as a method of reconstruction after resection of sarcoma of the humerus: a suitable option for reconstruction in cases of extensive involvement of the bone

**Results**

All 3 patients disease-free at the latest follow-up

One patient had implant failure (broken plate) and wound dehiscence – managed with Implant removal and Debridement

**Learning Points**

Phoco-reduction can be an important option of reconstruction in cases of extensive involvement of the humerus in pediatric sarcomas

Shortened limb length is acceptable to most patients

Elbow arthrodesis is performed whenever feasible with the elbow in functional position

Patients are also able to carry out certain activities of daily living

Amputation can be avoided not only in extensive tumors but also in sarcomas with fungation

**Case 2:** Recon plate broken and removed later at 2 months follow-up Distal humerus fused to ulna with two Steinmann pins and Recon plate with elbow in functional position at index surgery

**Case 3:** Patient at 5 months follow-up: able to position hand with ease for reaching objects

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