

A RARE CASE OF OSTEOSARCOMA SCAPULA TREATED WITH CUSTOM MADE SHOULDER PROSTHESIS

M. D. Kumar¹, B. Vijayan²

¹Professor, Department of Orthopedic Surgery, ESICMC & PGIMSR, Chennai.

²Assistant Professor, Department of Orthopedic Surgery, ESICMC & PGIMSR, Chennai.

ABSTRACT: 42 Year old gentleman from chennai developed hard swelling of his right shoulder blade. Biopsy was performed & a diagnosis of Osteogenic Sarcoma was made. He was advised fore quarter amputation elsewhere and at this stage he was referred to our hospital for limb salvage surgery (Scapulectomy). Custom made implant for subtotal resection of the scapula was planned and performed and the results were evaluated using DASH score.

KEYWORDS: Scapular replacement; Osteosarcoma; Rare presentations; Limb salvage; Cancer therapy.

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INTRODUCTION: Osteosarcoma is the most common malignant tumor affecting the bone with a bimodal age of distribution. The only option in age old days is amputation in the recent days the custom made mega prosthesis is becoming more popular for its versatility and design as well as patient compliance ...this is one such case a very rare presentation of the tumor in a middle aged male.

CASE REPORT:

BACKGROUND INFORMATION: 42 Year old gentleman from Chennai developed a hard swelling of his right shoulder blade. Biopsy was performed & a diagnosis of Osteogenic Sarcoma was made. Staging was done using TNM classification.⁽¹⁾ Our patient belonged to T²N⁰M⁰. He was given two cycles of Chemotherapy but the Tumor did not respond to this. He was advised amputation of his Right upper limb (Fore Quarter amputation) in a private hospital. He also took a second opinion where also he was advised that amputation was the only answer. At this stage he was referred to our hospital for limb salvage surgery (Scapulectomy).

Treatment Goals:

1. Firstly to remove the tumor in its entirety with wide margins and clearance taking care to preserve as much normal tissue as possible along with neuro vascular structures.
2. Secondly to reconstruct the shoulder girdle with bio mechanical stability to give efficient fulcrum for the elbow, wrist & hand to function without any problem.
3. Thirdly to give not only an anatomical reconstruction but to provide a functional shoulder for him to perform at least his activities of daily living like taking food, buttoning his shirt/combing his hair etc.

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Corresponding Author:

Dr. M. D. Kumar,

No. 1, 50th Street, Ashok Nagar, Chennai-600083.

E-mail: drkumar67ortho@yahoo.com

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Evaluation: After careful scrutiny, we took a 3 dimensional CT image along with his X-rays (Fig-1), Isotope bone scan & MRI; we gave the options to the patient and counseled him:

1. Fore quarter amputation
2. Custom made mega prosthesis of constrained design made of titanium for the near total arthroplasty of the shoulder.

The patient opted for custom made prosthesis and we proceeded with the surgery.

Operative Procedure: We had a team of orthopedic surgeons, surgical oncologists and vascular surgeons along with reconstructive plastic surgeon. The incision was planned along the line of previous biopsy and an extensile shoulder approach was used with the patient in left lateral decubitus position. First part of surgery was to resect the tumor (sub total scapulectomy) which was achieved without looking at the tumor & ensuring that all the important nerves & blood vessels were not damaged. Second part of the surgery was to implant the custom made scapular prosthesis & to attach all the muscles to it. In addition the scapular upper 1/6-1/5 portion was preserved and it contained all the essential muscular insertions to some extent. The deltoid was reattached to that of corresponding Trapezius. The Rhomboideus major and minor were reattached to the implant along with Teres muscles. utmost care was taken not to injure vessels and nerves. The resected tumor weighed 3.5 kgs. Then specially designed humeral prosthesis was fixed in place with bone cement. Next Scapular prosthesis was covered with a muscle flap raised from neighboring region. This state of the art surgical procedure took 8 hours. The tumor clearance was finally confirmed by standard frozen section biopsy⁽²⁾ and before final hemostasis and closure. Nodes were inspected and gross appearance was normal.

Post operative Protocol: Inj. Heparin was started immediately (5000 IU sc BID) along with Inj. cefotaxime 1g IV bid & Inj. Gentamycin 80 mg IV bid and the limb

maintained in elevated position with a supportive plaster slab applied in functional position.

Active range of motion exercises and passive stretching exercises of the shoulder, elbow and wrist. Strengthening exercises with rubber ball was initiated after 2 weeks along with cane stretch exercises for forearm and wrist. Isolation and integration exercises were also done. The joints were kept supple by wax therapy and ultrasound massage was used for breaking up simple adhesions.

RESULTS: The results of the procedure were evaluated using "The Disabilities of the Arm, Shoulder and Hand (DASH³) Score" system. The results were excellent and patient had a range of motion of shoulder about 60 % of normal and immediate post operative X ray shows the implant is in situ (Fig. 2). The patient is happy that he could have his limb. He is being followed up in our OPD. His pre operative DASH score was 62.6 which improved drastically to 42.6 within 3 weeks. The patient was happy that he could take care of activities of daily living with minimal discomfort.

DISCUSSION: The patient being a middle aged male was psychologically depressed because of his illness and with the expected five year survival rate of 60%⁽⁴⁾. Any way he was happy that at least his limb was preserved until his life...of course we need more follow up in this regard. On considering the psycho social aspects of health our patient had a good family support and parental support and care even when debilitated. The patient had a better quality of life index⁽⁵⁾ (as per WHO standards) compared to those who went for a fore quarter amputation⁽⁶⁾...the main disadvantage of this procedure is the cost of the implant and in near future indigenous production of the implant may be beneficial.

The role of adjuvant chemo therapy⁽⁷⁾ as well as neo adjuvant chemotherapy⁽⁸⁾ is very well known in these patients. The stigma of cancer in this patient and his questionable survival rate adds to his grievances but every effort was taken to give him the best he could get in this clinical scenario. When considering the limb versus life⁽⁹⁾ naturally it goes without saying patient's life is more important than his limb. But given a choice no one would dare to lose a dominant limb.

The debate goes on to loose the limb or loose the patient and the risks involved in retaining the limb considering the micro metastasis should be weighed against the decision to go for a limb salvage. It is known that CXCR4 antibody treatment suppresses metastatic spread to the lung of intratibial human osteosarcoma xenografts in mice.⁽¹⁰⁾ But of course we need a large multicentric trials in humans to comment about the same. This case is reported for its rarity and of course we need longer follow up to comment about the implant related complications such as loosening/muscle atrophy etc.

To conclude custom made mega prosthesis is a boon to patients and a safe and effective alternative to fore quarter amputation in patients without metastatic disease.

one should be guarded in taking a decision of limb salvage and the risks involved and the future requirement for amputation at a later stage should be explained well to the patient in order to improve the patient compliance for treatment and research is needed in the future to reduce the cost of the implant to make it feasible for a common Indian man/women to use it.

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Fig. 1

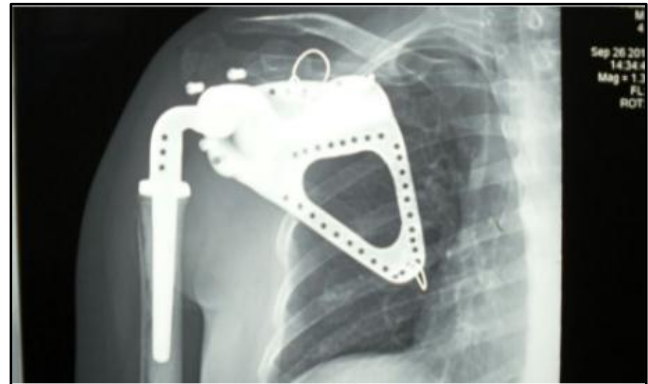


Fig. 2