

Case Report

Sternum & Clavicle Osteosarcoma: A Case Report & Literature Review

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Abstract

Osteosarcoma sternum and clavicle is rare tumor. We reported a case of 32 female presented with lump at sternum & right clavicle. X-ray chest showed osteoblastic lesion. MRI showed hyperintense lesion pushing the neck and superior mediastinum structures. Bone scan showed no distant metastasis. Wide margin resection of sternum with right mid clavicle done after median sternotomy. Chest wall defect reconstructed with prolene and titanium mesh. Bilateral chest tube placed. Wound closed. Biopsy turnout to be osteosarcoma. Adjuvant chemotherapy 6 cycles followed for 17 months with disease free survival.

Keywords: Osteosarcoma; sternum; clavicle; titanium mesh

Introduction

Osteosarcoma sternum and clavicle is very rare tumor. [1] Clavicle tumor is only 0.5% of bone tumors and sternum is 0.08% of all osteosarcomas [2, 3]. The clavicle and sternum tumors mostly are malignant. Plasmacytoma, osteosarcoma and Ewing's sarcoma are favorable site for clavicle and chondrosarcoma, myeloma and osteosarcoma for sternum [4]. After sternum tumor resection chest wall can be reconstructed with titanium mesh, allograft, autograft.

Case Report

We are presenting a case of 32 year old woman who admitted at department of orthopedic surgery Dow University of health sciences / Civil Hospital Karachi. She presented with lump at mid anterior thorax and right clavicle, for 23 years (Figure 1.1). It had grown steadily and was not painful at first but she has pain for 1 year. The pain was mild intermittent localized to the upper quadrant of chest and used to relief after taking counter analgesics. No history of loss of appetite or weight loss. On examination, lump of 15 x 20 cm hard irregular involving proximal 3rd of sternum, sternoclavicular joint and medial part of right clavicle. She has pursed lips with permberton test positive. There was a healed scar over the anterior aspect of mass. Head, neck, heart,

lungs, organs and the pulse were normal in physical examination. Lymph nodes not palpable and neurovascular of right arm was intact.



Figure 1.1:



Figure 2.1:

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Plain radiograph AP, Thoracic inlet and lateral view was done showing osteoblastic and sclerotic lesion involving sternoclavicular joint and right clavicle (Figure 2.1, 2.2, 2.3)

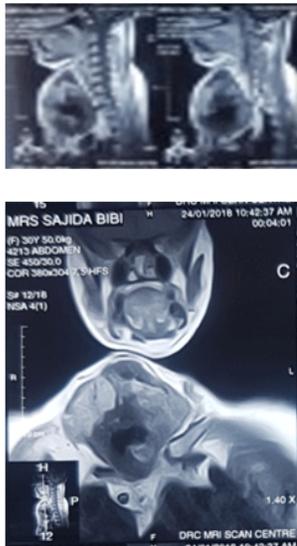


Figure 3: MRI: In M.R.I, a 12.5 x 12.0 x 7.9 cm mass was observed, from the root of neck to the anterior superior mediastinum. There was no metastasis (Figure 3).

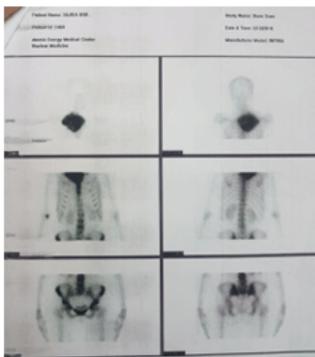


Figure 4: Bone scan showed no metastasis

Due to the tumor's situation and its proximity to neurovascular network, the patient was being discussed with Civil Hospital's multidisciplinary team consisting of thoracic, vascular, head n neck surgeons, radiologist, and pathologist. Decision on surgical resection of the mass was made after a review meeting between the mentioned surgical team and oncologists.

Surgical Resection

After thorough discussion at multidisciplinary team, the plan of surgical resection of tumor was made. Detailed high risk consent was taken from patient and her blood relatives in written. Intensive care team was informed and I.C.U bed was arranged pre-operatively along with ventilator. Plastic surgery team was called upon to remain stand by if

any reconstruction procedure needed after tumor resection. Under general anesthesia procedure started. Median Sternotomy done, both sides' ribs cut and sternum part and clavicle cut at mid shaft. Hemostasis achieved. Chest wall defect reconstructed first with prolene mesh over that titanium mesh fixed with screws to sternum and ribs. Bilateral chest tubes placed and wound closed.



Median Sternotomy



Resected Specimen



Prolene Mesh, Titanium Mesh Fixed, Wound closure

Figure 5:

Postoperatively Patient recovered smoothly and chest tubes removed after three days. Chest and both limb physiotherapy started. Stitches removed after 2 weeks. Biopsy revealed osteosarcoma. Adjuvant chemotherapy 6 cycles given to her which tolerated well and she is disease free till last follow-up of 17 months.

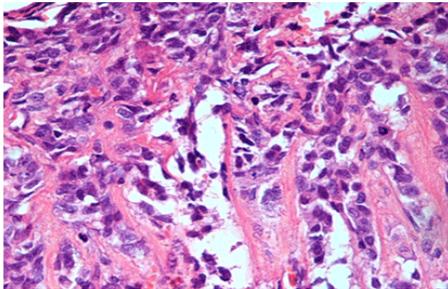
Pathology Report

The biopsy shows atypical cells in chondroid matrix (H&E, 400×). Hyper cellular foci showing atypical cells with small hyper-chromatic nuclei, inconspicuous eosinophilic cytoplasm, and a tendency to spindling. Immature atypical osteoid is noted at left (H&E, 200×). Macroscopic specimen bivalve along its long axis, showing a whitish gritty tumour circumferentially surrounding the cortex with minimal, largely inconspicuous medullary component (arrow). b. Most of the tumour was composed of necrotic immature osteoid and chon-droid (H&E, 20×). c. Focal minor medullary extension with host bone permeation by necrotic immature osteoid (H&E, 40x).

Gross Specimen



Microscopic slides.



Postoperative x-ray



Figure 6:

Discussion

Osteosarcoma of sternum is extremely rare tumor [1]. It has a poor prognosis. We search the literature and found the following cases in literature. In 2014, 57 year female presented with slow growing mass in the middle part of the sternum since 3 month with no other complain. On examination 4x5 cm, quite firm, immobile lump. CT guided needle biopsy was in conclusive then incisional biopsy, confirm the diagnosis of a high grade osteosarcoma. sternal defect was reconstructed using synthetic mesh and bone cement (sandwiched mesh) and fixed to the ribs and peristernal structures by nylon sutures and covered with pectoralis major muscle flap [1]. One case reported from Tianjin Medical university hospital in 1994, A 44-year-old man was admitted with a painless slow growing lump of the sternum in September 1994. Chest radiographs showed destruction of the manubrium sterni and

needle biopsy showed inflammation. A lump was 5x3 cm in size. CT showed osteolysis of the manubrium sterni, with the tumor extending in to the media stinum. 2nd Incisional biopsy revealed osteosarcoma. Using en block resection was performed, followed by reconstruction with a cryopreserved iliac bone allograft and systemic therapy [2]. A 51-year-old woman presents with recurrent, radiation-induced sternal osteosarcoma 11 years after receiving both radiation therapy for breast cancer and sternal reconstruction. Subsequent treatment was with chemo-therapy, surgical resection, and reconstruction of the sternum done with plate covered with flap. [5] In another study out of 13 primary sternal tumor, five were osteosarcoma. [6] From 40 years data studied at Memorial Sloan-Kettering Cancer Center only 10 (26%) in sternum, and 3 (8%) in clavicle [7].

Conclusion

Sternal and clavicle tumor are very rare entity, osteosarcoma is even rare. These problems must be treated with multidisciplinary approach to get the fruitful outcome. Wide margin resection and reconstruction with titanium mesh showed good results in our case.

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