

Case Report

Chest Wall Reconstruction :A Case Report

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Abstract

We are reporting a case of recurrent soft tissue tumor over the chest wall-histologically proven Dermato fibrosarcoma protuberance. Wide surgical excision with reconstruction is recommended for improvement of quality of life and prolong survival.

Key Words: Dermatofibrosarcoma protuberance, Sternectomy, Rib grafts, Muscle flaps, Skin grafting.

Summary

Dermato fibrosarcoma protuberance originates in the skin, appears as a slow growing red brown nodule. It is most commonly located on the trunk of the young men. The mean age of presentation is 35 years. These tumors rarely metastasize but are prone to local recurrence. A 27 years smoker, rajmistri presented with a recurrent soft tissue fibrosarcoma on anterior wall of the chest at Sir Salimullah Medical College & Mitford Hospital in August, 2011. Clinical examination and CT scan revealed neither bony nor regional lymph node involvement. The growth was excised with sternum along with bilateral costochondral junctions and some parts of ribs. The defect was reconstructed by ribs graft, then muscle flaps and finally skin grafting. The patient had uneventful post operative recovery.

Case Report

Mr. Enamul a smoker 27 years aged patient, hailing from Monirampur, Jessore got admitted into Sir Salimullah Medical College & Mitford Hospital, Dhaka with the complaints of a swelling in front of chest wall for 08 years which was initially slowly increasing in size. He gives H/O an operation two and half years back on abroad for that swelling. But it again reappeared after 01 year of operation which was rapidly increasing in size, occasional localized dull aching pain over

the swelling for same duration, an ulcer over the swelling for 2 months with serous discharge & occasional foul smell. He doesn't give H/O cough, haemoptysis ,jaundice, haematemesis, bone pain and weight loss. He is nondiabetic, normotensive. No member of his family suffers same type of disease. No sinus and pulsations - were noticed.

There was a swelling in front of body of sternum with a size of 10 cm x 8 cm, mildly tender, irregular surface, ill defined margin, firm to hard consistency, fixed with underlying structure & overlying skin. There was an ulcer (3cm x 2cm) over the swelling, with everted margin, floor covered with blackish necrotic tissue , base indurated. A horizontal scar mark over the swelling suggests previous surgery. Axillary lymph nodes were not Palpable. All other systemic examinations revealed normal. Routine hematological and coagulation studies were within normal ranges. Blood sugar, liver function tests and renal function tests were also within normal ranges.

FNAC -Compatible with SCHWANNOMA, which was inconclusive

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Fig. 1: Soft tissue Sarcoma on anterior Chest wall

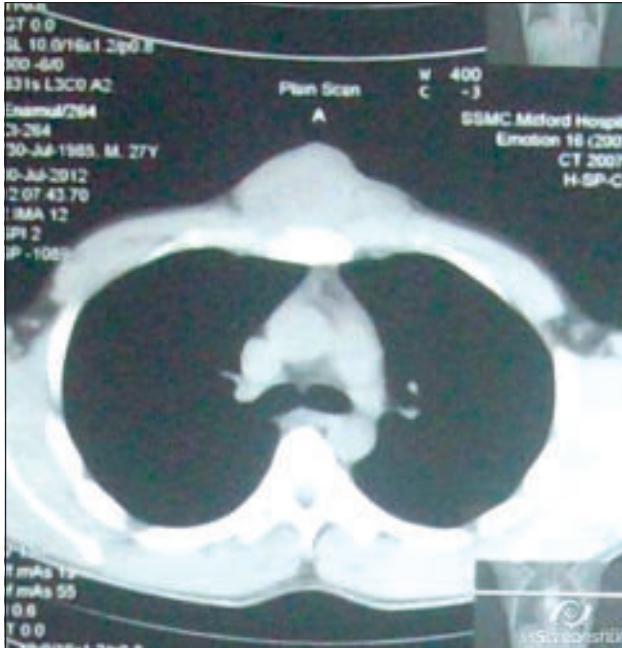


Fig. 2: CT scan of chest



Fig. 3: Incision line all around the swelling

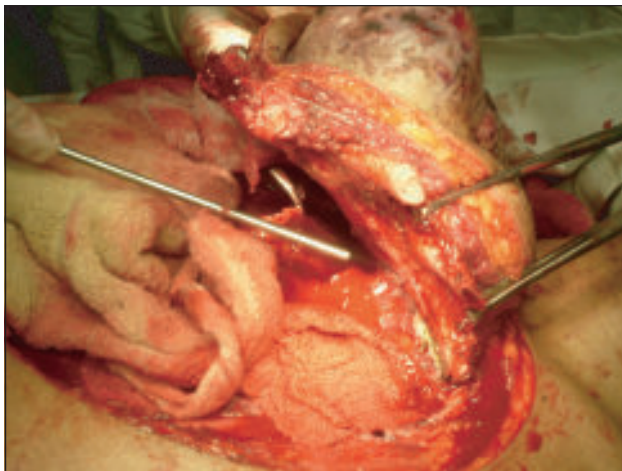


Fig. 4: Removal of swelling with sternum



Fig. 5: Extensive defect after excision

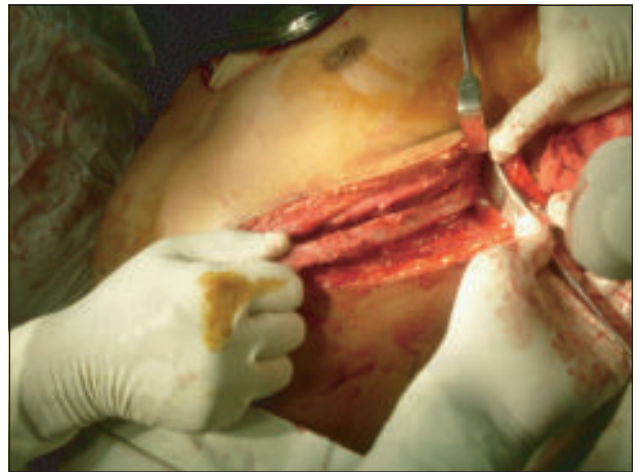


Fig. 6: Harvesting of rib



Fig. 7: Skeletal reconstruction by Ribs grafting

CT scan of the chest- A large lobulated soft tissue mass arising from the anterior chest wall (from sternum) to the exterior. No bony destruction seen. Biopsy : Excision biopsy shows Dermatofibrosarcoma protuberance.

After thorough preoperative and preanaesthetic check up, as the swelling was recurrent and looked very aggressive, wide excision with sternectomy and reconstruction of the defect by rib grafts and flap coverage were planned.

Surgical Procedure

Under general endotracheal anesthesia, an incision was made all around the swelling approximately 3cm apart from the swelling. It again reassessed & found fixed with the sternum. Excision of the swelling with sternectomy with removal of bilateral costochondral junctions and some parts of 2nd to 7th ribs were done. The defect was about 17cm x 17cm. On visual inspection and manual palpation lungs, pleura and mediastinal structures were normal. Skeletal reconstruction was done by rib grafts. 7th and 8th ribs from left side & 5th rib from right side were harvested. The ribs were mobilized off the underlying pleura without any breach of pleura. When sufficient length of ribs were mobilized, the ribs were divided laterally. Among them, 01 was intact & 02 were splitted into two parts. The intact one was fixed horizontally by stainless steel wire and splitted ribs were fixed vertically. Then ribs were covered by both pectoralis major muscles and one rectus abdominis muscle flap based on vascular pedicle. Then muscle flaps were covered by Split Thickness Skin Graft. The donor areas of both sides of the chest wall and abdominal wall were closed primarily leaving drains in situ. 02 units of blood were transfused. The total duration of the operation was 09 hours. In postoperative phase, no ventilatory support was needed. Patient's blood pressure, urine output and other vital signs were monitored routinely. Antimicrobials used were ceftriaxone, flucloxacilin and amikacin.

Results

Patient recovered well and did not have any respiratory difficulty on regular follow-up. First postoperative dressing was done on 7th postoperative day. Both the recipient and donor areas were healed uneventfully. Patient was back to his normal life after 06 weeks of operation.

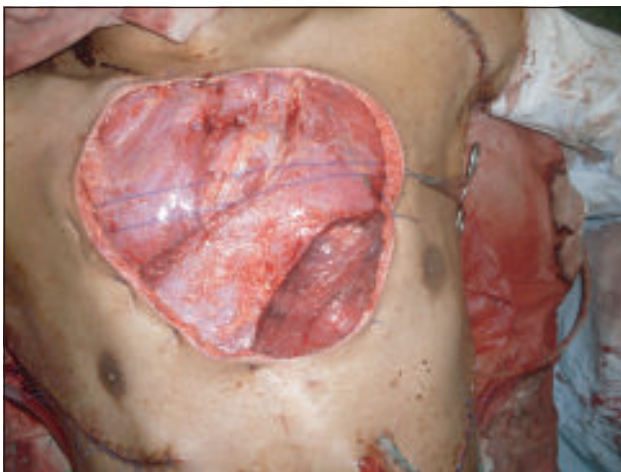


Fig. 8: Soft tissue reconstruction by muscle flap



Fig. 9: First postoperative dressing



Fig.-10: 4th week after operation

Discussion

Dermato fibrosarcoma protuberance originates in the skin, appears as a slow growing , red brown nodule. It is most commonly located on the trunk of the young men. The mean age of presentation is 35 years. This tumors rarely metastasize but are prone to local recurrence. They should be excised with a wide margin (upto 5 cm).

From a practical standpoint, treatment for cure is most often limited to resection of tumor, but inability to reconstruct large chest wall defects may compromise this.¹

The approach to a sternal tumor is made in two steps. First, the size and invasiveness is determined, followed by the histology. Careful radiological investigations are necessary to assess the extent of the tumor. The mass evident on examination is often part of a much larger tumor invading the sternum. CT scanning has enhanced the ability to distinguish into cystic or solid mass and to demonstrate invasion. In large tumors, a core needle biopsy or an incisional biopsy is done first. Care must be taken to plan the biopsy incision so that the subsequent excision can include the biopsy scar^{5,7}.

Surgery to perform wide resection and simultaneous reconstruction safely is the best treatment and basic step of multimodality approach. In 1978, Holder was the first to describe a partial sternectomy for a primary sternal sarcoma.⁵ Now the guidelines for resection are to get 5 cm of clear margin of tissue. Violation of tumor should be avoided and a full thickness chest wall resection to be carried out. Invaded contiguous structure should also be removed. Overlying skin should always be taken, if adherent or from site of previous biopsy^{5, 6, 7}.

A chest wall resection comprising a diameter >5 cm or > 4-5 ribs may result in chest wall flail³. With paradoxical respiratory motion & abnormal ventilation. Through proper skeletal reconstruction, chest wall flail may be avoided and respiratory function preserved³. One option for reconstruction of the chest wall skeleton is autogenous bone grafts, which avoids the use of foreign materials, donor sites for bone grafts include the ribs, Iliac crest and fibula. Vital to complete chest wall reconstruction is the soft tissue coverage. Well vascularized soft tissue cover is critical for proper wound healing, protection from infection and preservation of normal ventilatory function. Reconstruction of the chest wall soft tissue is most often completed with the use of local and regional muscle or musculo cutaneous flap.^{4,8,9}

In our case report, the tumour size was more than 5cm in diameter and after excision of body of sternum and adjoining ribs, the created defect measured as 17cm x 17cm, which was

very prone to develop paradoxical respiration but the patient escaped to develop flail chest. Here the defect was reconstructed with bone graft and muscle flaps without using any mesh and chance of infection was less. So, the mainstay of treatment of chest wall malignancy is adequate surgical excision followed by skeletal and soft tissue reconstruction using bone and viable skeletal muscle.

Disclosure

All the authors declared no competing interests.

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