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Reconstruction of chest wall chondrosarcoma with an anterolateral thigh free flap: An illustration of decision-making in chest wall reconstruction

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ABSTRACT

INTRODUCTION: Chondrosarcomas are the most common primary chest wall malignancy. The mainstay of treatment is radical resection, which often requires chest wall reconstruction. This presents numerous challenges and more extensive defects mandate the use of microvascular free flaps. Selecting the most appropriate flap is important to the outcome of the surgery.
PRESENTATION OF CASE: A 71-year-old male presented with a large chondrocarcoma of the chest wall. The planned resection excluded use of the ipsilateral and contralateral pectoralis major flap because of size and reach limitations. The latissimus dorsi flap was deemed inappropriate on logistical grounds as well as potential vascular compromise. The patient was too thin for reconstruction using an abdominal flap. Therefore, following radical tumour resection, the defect was reconstructed with a methyl methacrylate polypropylene mesh plate for chest wall stability and an anterolateral thigh free flap in a single-stage joint cardiothoracic and plastic surgical procedure. The flap was anastomosed to the contralateral internal mammary vessels as the ipsilateral mammary vessels had been resected.
DISCUSSION: The outcome was complete resection of the tumour, no significant impact on ventilation and acceptable cosmesis.
CONCLUSION: This case demonstrates the complex decision making process required in chest wall reconstruction and the versatility of the ALT free flap. The ALT free flap ensured adequate skin cover, subsequent bulk, provided an excellent operative position, produced little loss of donor site function, and provided an acceptable cosmetic result.

1. Introduction

Chest wall neoplasms account for 5% of all thoracic tumours,[1] with the most common primary chest wall malignancy being chondrosarcoma. Chondrosarcomas usually originate from the anterior chest wall – from either the costochondral junctions or sternum. They have a wide age range of presentation but typically occur in patients 30–60 years old. They are slightly more common in males, with a male to female ratio of 1.3:1. Chondrosarcomas can present as painful or painless chest wall masses.[2] At the time of presentation, 10% have pulmonary metastases.[1] The overall five-year survival rates are greater than 60% but may be over 80% in patients without metastases. Poor prognostic factors include an age over 50 years, incomplete resection, synchronous metastases, and local recurrence.[2]

It has been shown that radiotherapy or chemotherapy may not be very effective in treating chondrosarcomas,[3,4] particularly when low grade. The mainstay of treatment for chondrosarcomas, where possible, is complete excision sometimes with adjuvant therapy. In such cases, the primary aims of chest wall reconstruction are to ensure stability and good physiological functioning of the chest wall, as well as soft tissue closure of the defect. Good cosmesis is also a consideration. Loco-regional flaps are often the first choice for soft tissue coverage but due to the extensive resection often required part of the flap may be resected during tumour extirpation and their vascularity is often compromised. Furthermore, if the flap blood supply is tenuous there may be necrosis at the distal end and this can expose underlying organs leading to serious complications. Sometimes these patients have had radiotherapy making local flap options unreliable. For these reasons, some complex reconstructions require the use of microvascular free tissue transfer flaps.[5]

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2. Case report

A 71-year-old male presented with a two-month history of an asymmetrical chest wall due to a large, slow-growing, painless right-sided mass. The patient was a non-smoker, otherwise well and was a keen tennis player.

A chest CT scan (Fig. 1a) revealed features of a chondrosarcoma which impinged on the first and second ribs, manubrium, sternum and subclavian vessels. Abdominal and pelvic CT scans showed no evidence of metastatic disease. A pre-operative core biopsy of the mass confirmed a grade 2 chondrosarcoma. The overlying skin was freely mobile (Fig. 1b).

The patient was reviewed at the sarcoma multi-disciplinary team (MDT) meeting, where surgery was recommended in preference to primary radiotherapy or chemotherapy. He would require skeletal and soft tissue reconstruction and thus he was referred to the plastic surgery service. On assessment, a decision was made to use the contralateral anterolateral thigh (ALT) free flap. The advice

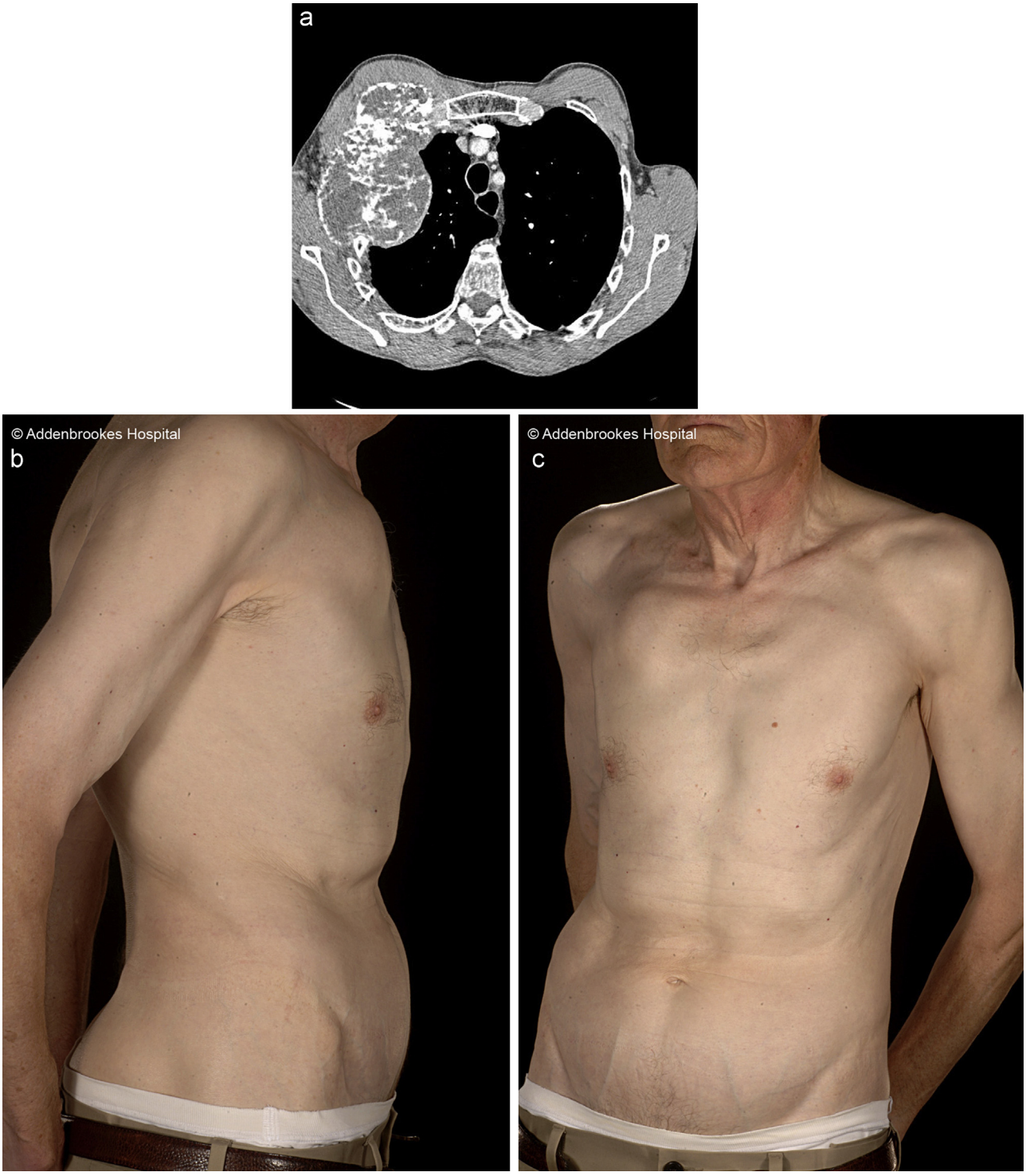

Fig. 1. (a) CT scan showing right-sided mass on chest wall and (b) pre-operative photos.