

## CHEST WALL HEMANGIOMA: A DIFFICULT PREOPERATIVE DIAGNOSIS

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### ABSTRACT

We report a case that presents a diagnostic challenge in a 22 year-old female. CT-Scan and MRI showed a soft-density mass (12 cm) causing middle arch erosion of the fifth rib. In this rapidly-growing chest wall tumor a surgical-biopsy was very hemorrhagic and frozen section was unable to disclose a sarcoma. Angiography and embolization of the feeding arteries were done. The final histopathology pointed out hemangioma. Complete resection was performed without prosthesis interposition. We emphasize two points regarding vascular chest wall tumors: (1) its possibility to mimic a sarcoma, so the surgical planning demands preoperative diagnosis; (2) the positive role of embolization in large and fast-growing lesions.

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### INTRODUCTION

Accordingly to the International Society for the Study of Vascular Anomalies (ISSVA) vascular anomalies (angiomas) should be divided in two large groups : vascular tumors and vascular malformations. The former includes mainly hemangiomas and are characterized by hyperplasia due to proliferation of endothelial cells, pericytes and smooth muscle cells . Vascular malformations have been defined as a dysmorphogenic process made of dysplasic vessels and without cellular proliferation [1]. We report a case of a chest wall hemangioma pointing out the importance of definite diagnosis to establish the correct surgery.

A 22-year-old woman was referred to our Department for evaluation of a right chest wall tumor that appeared recently (2 months) and rapidly became prominent. She denied trauma. Her physical examination was remarkable for a firm and smooth lesion measuring approximately 8 x 12 cm and located in the axillary region at the level of the third, fourth and fifth ribs. No thrills or bruits were heard on auscultation and the overlying skin was intact. A chest radiograph demonstrated erosion in the middle arch of the fifth rib. A CT-Scan and a MRI showed a huge tumor of 12 cm in the great axis promoting an irregularity in the adjacent visceral pleura. A surgical-biopsy was followed by hemorrhage and the frozen section was unable to disclose a sarcoma. Postoperatively an angiographic study

allowed a clear visualisation of 4 pedicles feeding the tumor, mainly the 3<sup>rd</sup> intercostal artery. Embolization was accomplished with Ivalon and micro-coils. Final histopathologic diagnosis pointed out a benign vascular tumor. A chest wall resection including the third rib and the musculature adjacent to the tumor was done. There was no evidence of pleural or pulmonary involvement. Definitive histopathology confirmed a skeletal muscle hemangioma. The patient had an uneventfull recovery and was sent home in the 7<sup>th</sup> postoperative day. A six-month follow-up was absolutely normal.

### COMMENT

It is well established that hemangiomas are an unusual group of chest wall tumors. Although 73% of hemangiomas are present at birth [2] in the setting of intramuscular hemangiomas, a traumatic etiology has been implicated [3], at least as a promoter of the tumor expansion [4]. Concerning the hemangiomas, those involving the rib cage could also be divided in intramuscular hemangioma and bone hemangioma. Skeletal muscles hemangiomas represent 0.7% of all benign hemangiomas and had a wide anatomic distribution [2]. They were located mostly in the quadriceps muscle (19%) with the intercostal musculature been affected in only 1.4% [5]. Bone hemangiomas showed a great predilection for the spine

and skull and not more than 2.8% were located in the ribs [6]. The tumor appeared early in life or has been noted for several years. Others observed evolutions through a 12-month [4, 8] or 36-month [3]. On palpation a tender non-pulsatile mass is generally found to be fixed along the muscular plane. The presence of thrills or bruits may indicate a high-flux vascular malformation.

Diagnosis was stated preoperatively in only 19% of 335 cases of skeletal muscle hemangiomas [7]. Commonly mistaken diagnosis include sarcoma, lipoma, and abscess. Transthoracic needle biopsies are useless [3] and even hazardous as massive hemothorax and emergency thoracotomy had already been reported [8]. After a hemorrhagic surgical-biopsy that demanded blood transfusion our strategy was to attend a definite diagnosis and perform an angiographic study. Besides, frozen section was dubious about malignancy. The lesion presented some malignant characteristics like: large size, deep location, bone erosion and heterogeneity. The MRI was not able to show "worm-like" structures that could suggest a hemangioma-type presentation. On the other hand even aggressive neoplasms do not typically reach this size in two months. Painless tumor with such a rapid growth suggests hemorrhage into the lesion. In our case-report even a frozen section was not able to disclose sarcoma giving rise to the fact that chest wall hemangiomas may mimick a much more aggressive tumor, that would demand a well planned and more radical chest wall resection. With obvious cosmetic and functional consequences. Vascular lesions should be biopsied if there is any suspicion of malignancy [9].

Selective angiography has played a major role as a diagnostic as well as therapeutic tool in some cases [10]. We performed an angiographic study that demonstrated hypervascularization and embolization of the 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> intercostal arteries and a branch of the external thoracic artery was done as a bridge to a less problematic surgical resection.

Hemangiomas in the proliferation phase expresses bFGF, vascular endothelial growth factor (VEGF), and collagenase IV [11]. Perhaps in the near future laboratory data may facilitate diagnosis of vascular chest wall tumors. Complete excision with or without prosthetic replacement is the treatment that should be applied, always remembering that local recurrence up to 18% was observed in a review of 89 cases of skeletal hemangioma [13].

We concluded that in rapid-growing chest wall tumors the diagnosis of hemangioma should be kept in

mind and surgical-biopsy is a main step to a correct surgical schedule. CT-Scan, some features of MRI images and specially angiography may be helpful to suggest hemangioma. Finally, embolization of the vascular pedicles seems to facilitate the surgical approach by shrinkage of large tumors.

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