Infraclavicular subpectoral lipoma causing thoracic outlet syndrome

Stefano Elia, Alessandra Cerioli, Valeria Fiaschetti, Alessandra Vittoria Granai

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A B S T R A C T

INTRODUCTION: Thoracic outlet syndrome (TOS) includes a group of disorders caused by extrinsic compression of neurovascular structures between the 1st rib and clavicle. It usually presents as an enlarging neck mass, with shoulder or upper limb pain, weakness, paresthesias and impalpable radial pulse (Raynaud’s phenomenon).

PRESENTATION OF CASE: We report a rare case of TOS caused by an infraclavicular subpectoral lipoma that, although challenging because of limited access and proximity of vital neurovascular structures, was successfully removed through a simple transaxillary incision with an excellent esthetic result. The patient is symptom-free 6 months after surgery.

DISCUSSION: Multiplicity of symptoms makes causes, diagnosis, and treatment of TOS controversial. Accurate diagnosis of TOS can be a substantial challenge in practice, because of a lack of physician awareness, overlapping of clinical features, and an absence of clearly defined diagnostic criteria. TOS may be associated with the presence of a benign subpectoral mass like lipomas, that seldom have an irregular distribution that involve neurovascular structures.

CONCLUSION: Although benign soft tissue tumors infraclavicular subpectoral lipomas may exert pressure on neurovascular surrounding structures during their progressive expansion and cause TOS. Therefore, a thorough preoperative study by radiological imaging such as MRI or neurophysiological test should always be performed in order to prevent unintentional lesions of the involved axillo-subclavicular plexus and plan correct surgical procedure.

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2. Presentation of case

2.1. Patient history, clinical examination and imaging

A 30-year old lady from Bangladesh was referred with a 6 months history of increasing subpectoral and shoulder pain, right arm swelling, right forearm paresthesias and an expanding mass in the right supraclavicular region. The patient complained of weak grip and her right hand was cold to touch. The physiological adduction of the arm was limited by exacerbation of all symptoms. Clinical examination revealed a firm, tender mass in the supraclavicular fossa, overlying the skin, that extended downward and spread around and between pectoral muscles. The patient had been referred by general practitioner to undergo a thoracoscopic sympathectomy but the clinical pattern induced more accurate investigations. Contrast computed tomography (CT) and magnetic resonance imaging (MRI) T1 and T2-weighted sequences by fat-suppression techniques, revealed a 125 x 72 x 46 mm subpectoral thinly septated hypodense mass extending from the neck to the anterior right hemithorax. The ovoidal well capsulated mass in the right retroclavicular and subclavicular region, between the axillary artery and vein, displaced the axillary–subclavian bundle anteriorly without extension into the neural foramina (Fig. 1). The lesion compressed the brachial plexus and was consistent with either a lipoma or liposarcoma.

The ulnar and median nerve conduction study and electromyography revealed a generally decreased conduction at cubital tunnel level.

2.2. Surgical procedure

Severe compressive symptoms and inability to exclude malignancy suggested surgical treatment. INR was maintained between 2 and 3 because the risk of thrombosis was considered more important than an intraoperative hemorrhage. Moreover, the features and the location of the mass would suggest a short surgical time. The surgical procedure was performed under general anaesthesia, in dorsal decubitus and right arm hyperadduction to better expose axillary region and right hemithorax. An axillary incision was made along the anterior border of the latissimus dorsi muscle and the lateral border of the pectoralis minor from high in the axilla to the 4th rib level. The fat and lymphatic tissue were removed and access to the axillary vein was gained where a lipomatous mass was detected. The mass followed the axillary vessels, separating the artery upward and anteriorly from the vein downward, in a complete subpectoral position, developing itself up to the supraclavicular fossa and displacing the subclavian artery anteriorly. No infiltration of surrounding structures was detected so the mass was carefully isolated following the vascular bundle and the brachial plexus up to the subclavicular edge and supraclavicular fossa (Fig. 2). The mass was completely removed with no need of a further supraclavicular incision and a 10 French drain was left in place. Final pathology was consistent with a capsulated 120 x 60 x 25 mm lipoma of 160 g showing some steatonecrotic area in its context but no sign of malignancy (Fig. 3). The diagnosis of benign lipoma was confirmed also by immune-histochemical analysis.

The patient was discharged on the 2nd postoperative day without any complication. At 6 months from surgery the patient was completely symptom-free, a computed tomography showed no recurrence and last but not least, esthetical results were excellent.
3. Discussion

Thoracic outlet lesions are usually represented by an enlarging neck or supraclavicular mass that is typically associated to upper shoulder or arm pain.

TOS real incidence in the general population is not known due to the absence of widely recognized signs or cost effective laboratory tests, and the lack of sufficient diffusion of the syndrome in the medical literature, it is also a poorly defined medical entity. The actual incidence seems generally low (from 3 to 80 cases per 1000) even though in more recent studies the incidence appears to be higher, and this disease is an often misdiagnosed cause of chest, neck and shoulder pain and one of the frequent upper extremity neuropathies related to sport [1,3,8].

Main causes of TOS are congenital abnormalities such as cervical rib, prolonged transverse process, and muscular abnormalities (scaIenus anticus muscle, a sickle-shaped scalenus medius) or fibrous connective tissue anomalies, neck and shoulder trauma (whiplash injuries), functional acquired causes, more rarely tumors, hyperostosis and osteomyelitis.

TOS may be neurogenic, venous, and arterial. All forms are rare, but clinically significant because, when unrecognized or inadequately treated, they can cause chronic pain syndromes, long-term limitations in use of the upper extremities, and substantial disability even in relatively young, active, and healthy individuals. Accurate diagnosis of TOS can be a substantial challenge in practice, because of a lack of physician awareness, overlapping of clinical features, and an absence of clearly defined diagnostic criteria. Neurogenic compressive symptoms of brachial plexus consist of pain, numbness, and paresthesia affecting the neck, upper back, shoulder, arm, and hand with weakening grip. These symptoms are typically dynamic, with marked exacerbation during positional maneuvers such as the 3-min elevated arm stress test (EAST). The vascular TOS, namely compression of one or more veins and arteries, is characterized by spontaneous swelling of the entire arm, cyanotic discoloration, heaviness, pain, weak or no pulse in the affected arm, tiny black spots on fingers. Recognition and conservative management of these problems make the necessity for affected arm, tiny black spots on fingers. Recognition and cyanotic discoloration, heaviness, pain, weak or no pulse in the neck or supraclavicular mass that is typically associated to upper shoulder or arm pain.

The clinical pattern in our patient and the typical localization of the mass were strongly consistent with a thoracic outlet syndrome since a neurovascular compression in the upper extremity was present following a pressure on the nerves and vessels in the syndrome since a neurovascular compression in the upper extremity of the mass were strongly consistent with a thoracic outlet syndrome. The rationale for this approach is that 1st rib resection permits the widening of both the interscalenic triangle and the costoclavicular space. Other procedures include supraclavicular incision, preferred by neurosurgeons or posterior subscapular approach which is reserved to more complicated TOS [10–12].

Our surgical approach was suggested by the age of the patient and anterior location of the mass. Differently from standard transaxillary procedure it did not require release of scalene muscle attachments nor 1st rib resection even though the careful caudocranial separation of the neurovascular bundle was technically demanding. Moreover, the benign pathological outcome supported our strategy.

4. Conclusion

Benign subpectoral infraclavicular masses should be taken into consideration when evaluating a possible thoracic outlet syndrome in patients with brachialgia, loss of strength and Raynaud’s phenomenon. A thorough radiological assessment, preferably by MRI with fat suppression technique as in our case, is mandatory to ascertain neurovascular compression by large lipomas.

Conflicts of interest

No conflicts of interest to declare.

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Authors’ contribution

Stefano Elia: study design, data collections, data analysis, writing.

Alessandra Cerioli: data collections, data analysis, writing.

Valeria Fiaschetti: data analysis.

Alessandra Vittoria Granai: study design, data collections.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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