CASE REPORT

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Surgical management of adult supraclavicular hemangioma: a case report

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ABSTRACT

Introduction: Hemangioma is one of the most common vascular anomalies. It is classified into two types: superficial hemangioma, also known as capillary hemangioma, which appears as brilliant red macular masses, and deep hemangioma, which appears as a soft, non-fluctuating, poorly defined, and occasionally bosselated nodule. Surgical excision is recommended for cavernous-type tumors, which are less sure to regress. Despite its benign origin and behavior, it can develop in any body part. However, its size and origin site may vary and make surgical excision more challenging due to the importance of the structures surrounding the mass. Thus, this study aims to explain the surgical management of adult supraclavicular hemangioma.

Case Description: We present a case of primary cavernous hemangioma in 36 years-old-woman with no history of health problems that extends to the supraclavicular area and was linked to essential structures. The surgical excision was performed through a double-incision technique to prevent iatrogenic damage to the system. Postoperative evaluations revealed no impairment of motoric and sensory hand functions, and the patient was discharged three days postoperatively. Histopathologic findings were consistent with the diagnosis of hemangioma.

Conclusion: The supraclavicular approach in surgery is challenging due to its critical location and closeness to key neurovascular structures. To obtain the best surgical outcome, the essential operating concepts include thorough dissection and a modified method to limit the risk of functional status and mobility impairment.

Keywords: cavernous hemangioma, supraclavicular, adult hemangioma, surgical excision.
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INTRODUCTION

The most common location of hemangioma is on the head and neck. It is about 60% of total cases, 25% on the trunk, and 15% on the extremity. The most common benign vascular tumor of infancy, infantile hemangioma, affects 4% to 5% of newborns. Hemangioma also can arise in an adult.[1] They expand proportionately to the children, with a sharp increase in adulthood. Rapid growth can occur during puberty, pregnancy, or following a major event. Female sex, premature delivery, low birth weight, and a pale complexion are also risk factors.[2]

The cause of hemangiomas is unknown; however, several ideas exist. The increase in GLUT 1 and VEGF synthesis due to hypoxic stress, resulting in endothelial progenitor cell migration, hemangiomas stem cells from trophoblast and angiogenesis process, have all been proposed as hypotheses for the formation of hemangiomas.[1]

Hemangioma is further categorized histologically into capillary and cavernous types. With a shorter clinical history, a capillary hemangioma comprises many small capillary lines by a single layer of endothelial cells directly supported in a connective tissue stroma of varying densities. In contrast, a cavernous hemangioma comprises large, thin-walled vessels or sinusoids lined by epithelial cells and separated by a thin layer of connective tissue septa. Adult hemangiomas are distinctive from pediatric hemangiomas, which proliferate during childhood, involute slowly over several years, and eventually regress.[3] This abnormality can occur throughout the whole body, though the size and site of origin may vary. Surgical excision, sclerotherapy, and angiographic embolization are now frequent therapeutic methods.[2] Nevertheless, surgical excision is the preferred option for this condition. However, the tumor's location may complicate the procedure and make the risk of the procedure even higher. In the present case study, we report the case of cavernous hemangioma of the supraclavicular area.

CASE DESCRIPTION

The patient was a 36-year-old woman with a non-painful mass over her right shoulder that had gradually increased for two years. The patient disclaimed any local tenderness, bruits, spontaneous hemorrhage, or cardiac symptoms. On physical examination, a soft, non-pulsatile, partially compressible fixed mass was found in the right supraclavicular region, without thrill or inflammatory signs and measuring approximately 4 cm. Motoric and sensory hand functions were normal. No other masses were found on general examination. Written Informed consent was obtained from the patient to publish this report and any accompanying images.

Initial paraclinical evaluations with ultrasonographic revealed the increased blood supply to the lesion mentioned

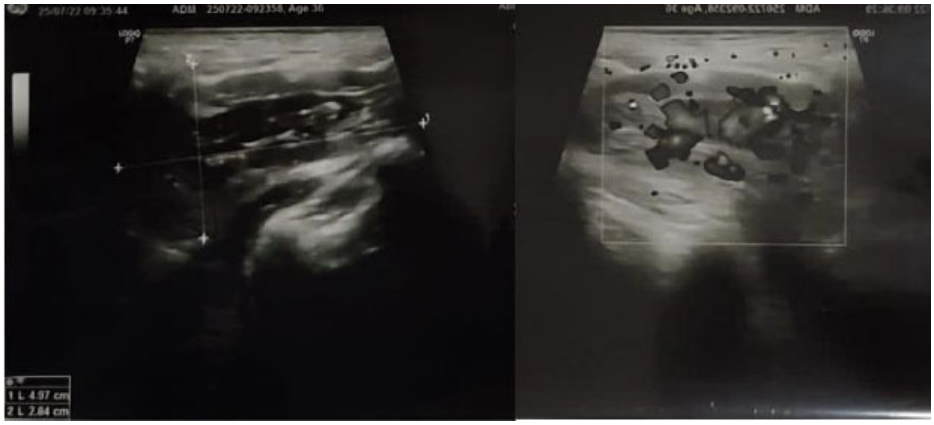

Figure 1. A well-defined, solid, ovoid lesion measuring 4.97 x 2.84 cm was seen with significant vascular flow inside the lesion.

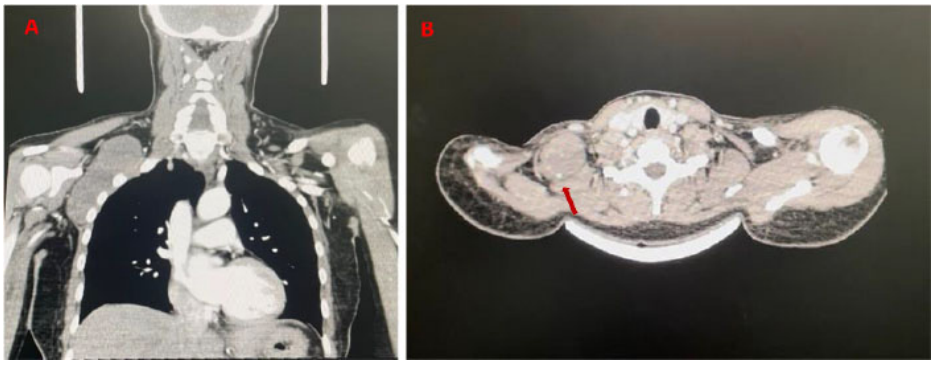

Figure 2. A) Coronal CT images show the mass extending and adhering to essential structures in the supraclavicular area. B) Opacities located on axial slices involving the soft tissue mass (red arrows).

above, indicative of a vascular lesion (Figure 1). FNAB confirmed the mass as hemangioma, and no malignant cells were identified. Selected coronal (Figure 2A) images from a contrast-enhanced CT showed a soft tissue mass measuring 8.7 cm in craniocaudal, 6.3 cm in anteroposterior, and 3.6 cm in transverse measurement arising from the right chest wall, attached with the serratus anterior muscle. Axial images (Figure 2B) show that the mass extends to the supraclavicular area, is well-circumscribed, with minimal intra-lesion vascularity, and is inhomogeneous with the hypodense area at the center. The mass adheres to several blood vessels, specifically the subclavian artery, vein, and right axillary artery.

A dual-incision approach for surgical excision was performed to remove the mass. The first incisions were made on the supraclavicular, approximately 1 cm above the clavicula. We split the platysma muscle, identified and protected the supraclavicular nerves, and carefully deepened the incision through the omohyoid muscle to access the base of the hemangioma. The brachial plexus's lateral, posterior, and medial cords are not mobilized but instead protected by direct visualization to avoid damage to this vital structure. A second incision was made on the infraclavicular to provide better access to the base of the hemangioma. Then we identified and protected the cephalic vein, axillary artery, and brachial plexus cords that had already been exposed in the supraclavicular approach. The resected hemangioma showed a solid mass measuring 6 x 5 x 2.5 cm (Figure 3). The postoperative course did not have a mentionable event as we observed the motoric and sensory hand functions for any possible iatrogenic injury. The patient was discharged three days postoperative day with no impairment. Pathological reports the findings were consistent with a cavernous hemangioma, with the specimen composed of proliferating medium to large blood vessels lined with a layer of endothelium filled with erythrocytes. Blood vessels are scattered between connective tissue and adipose tissue.

DISCUSSION

Hemangioma is defined by hyperplasia of blood vessels, most often veins and capillaries, in a concentrated region of submucosal connective tissue4. Endothelial cells produced from proliferative hemangiomas undergo clonal growth, and their proliferation and migration rates differ from those of normal endothelial cells[5]. Hemangioma growth appears to be connected to an imbalance between positive and negative angiogenic factors generated by the tumor and surrounding normal tissues. Furthermore, VEGFR2 constitutive signaling inhibits vascular endothelial growth factor receptor 1 (VEGFR1).[3]

Based on histology, hemangiomas can be further categorized as capillary and cavernous types. Hemangiomas of the capillaries are usually observed in the epidermis and subcutaneous tissues. These are more frequent among young children and typically regress as cavernous hemangiomas are more prevalent among adolescents and adults and involve deeper structures. These lesions have a reduced likelihood of regression over time. A histologic examination will reveal large blood-filled cavities. Samples of cavernous hemangioma display dilated blood vessels with a large diameter[7]. In line with this study, paraclinical evaluations with ultrasonographic showed the increased blood supply to the lesion mentioned above, indicative of a vascular lesion. The same finding was also found in another case report.[4]

Different signs and symptoms appear in the patient with hemangioma. It is according to the location of the hemangioma. Thus, supporting examination is needed. Adult laryngeal hemangioma had a chief complaint of hoarseness for almost seven years.[4] Worsening epigastric pain for three months had been experienced 18 years old female with cavernous hemangioma.[5] An intramuscular hemangioma presented a symptom of the dull-aching headache of the right temporal region for the last 10

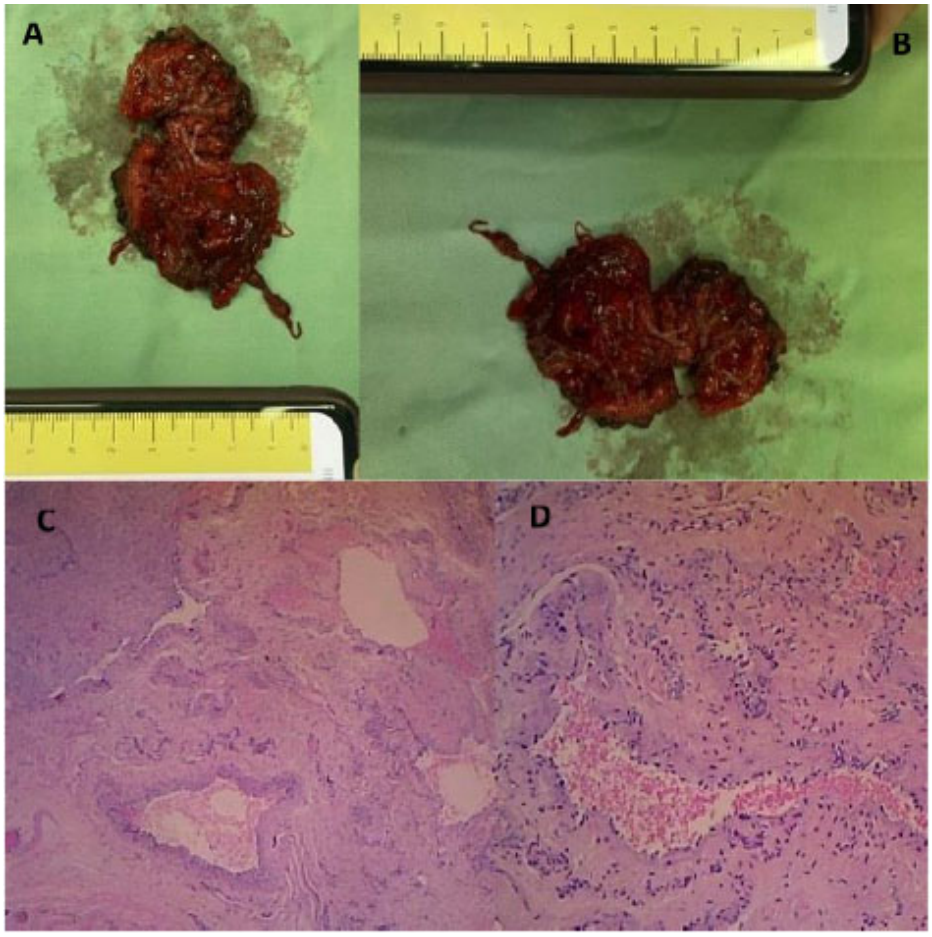

Figure 3. Macroscopic (A, B) and microscopic findings of resected hemangioma. C) Medium to large-sized blood vessels (40x magnification). D) Higher magnification showed endothelial cells lined the blood vessel, and its lumen contained erythrocytes (100x magnification).

years.[6] Interestingly, in this case, report the patient had no symptoms, only a non-painful mass over her right shoulder that had gradually increased for two years. The several case reports above prove that various signs and symptoms could appear according to the location of hemangioma.

Ultrasonography revealed it detected flow on preliminary mass screening, which indicates hemangioma in this case. This technique for examining tiny, superficial, and suspected solid visceral lesions are generally straightforward, non-invasive, and produces a positive result.[7] It uses CT angiography to show the vascular architecture and extent of the lesion, and enhanced CT can identify a phlebolith in some situations of venous malformation, such as in our patient. Phleboliths are calcified thrombi that can be seen in blood vessels. These are common in the context of hemangiomas or vascular abnormalities and are often asymptomatic. Changes in blood flow dynamics inside hemangiomas or vascular malformations lead to the creation of thrombus and phleboliths.[8]

Managing hemangioma depends on many conditions; most cases of hemangiomas do not require intervention. However, 10–20% require therapy due to size, precise placement, development or regeneration stages, functional impairment, and behavior. Surgery, pulsed laser, intralesional injection with the fibrosing agent, interferon alpha-2b, and electrocoagulation are among the therapy options, whereas cryosurgery, compression, and radiation were formerly utilized.[9] Each treatment modality carries its own set of risks and advantages. The surgery was conducted based on the size and location of the lesion. In our instance, the major goal of surgery is to prevent nerve compression, blood flow issues to the affected limbs, and loss of function due to the hemangioma's constant growth. Due to the risk of recurrence with abnormal vascular dilation or regeneration, the lesion should be completely excised during resection if residual tissue is left behind.[10] With the nerves, tendons, vascular tissue, and other vital structures surrounding the mass, the risk of surgical excision is increased due to the location of hemangiomas, as seen in our case. It is simple to induce a physical impairment by iatrogenic causes. Nerve injuries can be catastrophic for patients, resulting in loss of sensation, paralysis, and pain. Permanent deficits may have severe functional implications.[11]

CONCLUSIONS

Surgical excision is the preferred curative therapy for cavernous hemangiomas because it is less likely to regress. A correct diagnosis and carefully planned and executed safe resection in the high-risk location of the lesion are imperative for appropriate treatment. However, the modified technique might be performed to reduce the risks of iatrogenic injury after surgery and provide the best possible care to the patients.

DISCLOSURE

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Author Contribution
All of the authors contributed to this manuscript.

Conflict of Interest
We have no conflicts of interest to declare.

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