Radiology Case Reports 13 (2018) 47–50

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://Elsevier.com/locate/radcr

Diagnostic Imaging

Hibernoma in the clavicular fossa: A case report and literature review

Hongzeng Wu[a], *Xiaotong Ma*[b], *Ze Li*[c], *Helin Feng*[a,*]

[a] *Department of Orthopedic Surgery, Hebei Medical University Fourth Affiliated Hospital and Hebei Provincial Tumor Hospital, 12 Health Road, Shijiazhuang, Hebei 050051, China*

[b] *Department of Breast Cancer Center, Hebei Medical University Fourth Affiliated Hospital and Hebei Provincial Tumor Hospital, Shijiazhuang, Hebei 050051, China*

[c] *Department of Emergency, Hebei Medical University Second Affiliated Hospital, Shijiazhuang, Hebei 050051, China*

ARTICLE INFO

Article history:
Received 5 September 2017
Received in revised form 22 October 2017
Accepted 30 October 2017
Available online 7 December 2017

Keywords:
Hibernoma
Surgery
Computed tomography angiography

ABSTRACT

A hibernoma is a benign soft tissue tumor consisting of brown adipose tissue. The tumors are mostly located in the thigh, back, and shoulder region. They are rarely found in the supraclavicular fossa. We report a 39-year-old woman who presented with a painless, slow-growing mass on the left supraclavicular fossa for nearly 15 years. Magnetic resonance imaging (MRI) showed an inhomogeneous round mass with a slightly hyperintense signal on fat-suppression T2-weighted imaging that compressed the adjacent tissues and subclavian vessels. Computed tomography angiography indicated a rich blood flow signal. Postoperative histology confirmed the diagnosis of a hibernating tumor. Although comprehensive imaging is important in the determination of tumor for the size, location, and nature, computed tomography angiography provides clear indication of the vascularity of the tumor, which provides vital clinicopathologic data for surgeons.

Case

A hibernoma is a benign soft tissue tumor consisting of brown adipose tissue. The tumors are mostly located in the thigh, back, and shoulder region [1]. They are rarely found in the supraclavicular fossa. A 39-year-old Chinese woman was hospitalized for a nonsymptomatic, slow-growing left clavicular fossa mass that was first noticed 15 years ago. Physical examination revealed a palpable soft, nontender mass, approximately $6 \times 4 \times 4$ cm in size. The local skin temperature did not notably increase.

Laboratory studies, including routine blood evaluation, hematocrit, liver and renal functions, electrolytes, coagulation function, routine urine test, and cardiac and pulmonary functions were normal. Computed tomography (CT) of the chest

Competing Interests: The authors have no ethical/legal conflicts related to the article.
Compliance with Ethical Standards: The patient provided written informed consent for the publication of these case details, and the consent procedure was approved by the Human Ethics and Research Ethics committees of the Third Hospital of Hebei Medical University.

* *Corresponding author.*
E-mail address: helinfeng0311@163.com (H. Feng).

https://doi.org/10.1016/j.radcr.2017.10.024

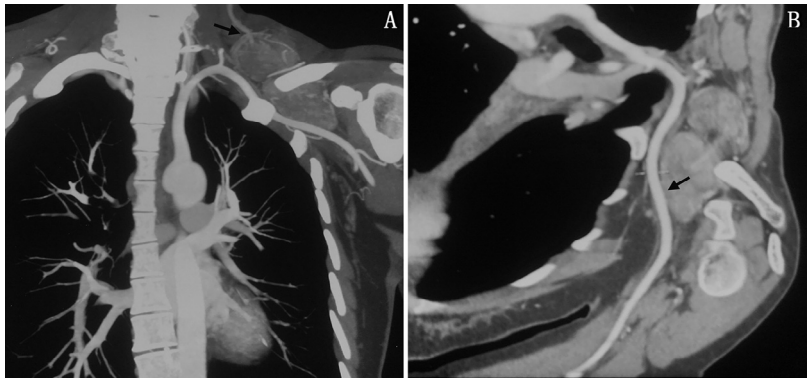

Fig. 1 – (A) CTA of supraclavicular fossa hibernoma. (B) Coronal CTA showing clear imaging of proximal blood vessels. CTA, computed tomography angiography.

revealed a heterogeneous low-density shadow with sharp margins extending to the left axilla. The CT attenuation value was –4 to 9 HU. Magnetic resonance imaging showed an inhomogeneous round mass with a hypointense signal on T1-weighted imaging, a hyperintense signal on T2-weighted imaging, and a slightly hyperintense signal on fat-suppression T2-weighted imaging [2]. The mass distinctly compressed adjacent structures and the subclavian vessels. To clarify the blood supply of the mass, the patient consented to undergo computed tomography angiography, which revealed a rich blood flow signal around the mass (Figs. 1 and 2). Resection was performed to relieve pressure symptoms and to clarify the pathology. Intraoperative visualization revealed the strong adherence of the tumor to the brachial plexus nerves and compression against the subclavian vasculature. Careful resection was performed with a sufficient surgical margin after cutting off the clavicle. The fracture ends were repaired using a locking plate and a screw (Fig. 3).

On gross morphologic examination, the surgical specimen comprised a well-circumscribed reddish brown mass in a thin transparent membrane and some normal soft tissue. The whole mass measured 12.5 × 6.5 × 4.0 cm. The cut surface was yellow, fatty, and lobulated, and showed focal pale fibrous tissues. Postoperative pathologic examination showed the adipose cells had abundant, multivacuolated eosinophilic cytoplasm, and moderately defined cytoplasmic borders (Fig. 4). These histologic features were consistent with those of a hibernoma.

Discussion

A hibernoma is occurs most commonly in adults at 40-70 years of age, with a mean age of 38.0 years (range, 2-75 years) [3]. Pediatric hibernoma is rarely seen. According to a clinical pathologic study of 170 patients with hibernomas carried out by Furlong et al in 2001, the morbidity was slightly higher in men than in women, and the tumors were located mostly in the thigh (29.4%), shoulder (11.8%), back (10.0%), neck (9.4%), chest

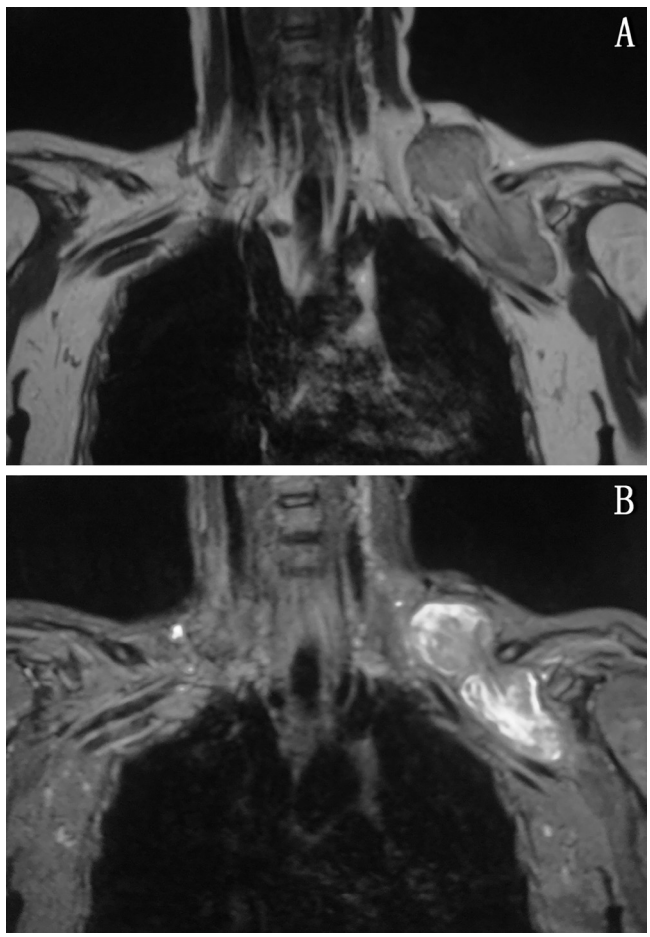

Fig. 2 – Axial CTA showing subclavian vascular compression caused by the mass. MRI of the neck. (A) Coronal MRI showing the presence of a supraclavicular fossa mass with an inhomogeneous round mass low T1-weighted imaging signal. (B) T2-weighted MRI showing a well-defined mass with a high T2-weighted imaging signal. CTA, computed tomography angiography; MRI, magnetic resonance imaging.

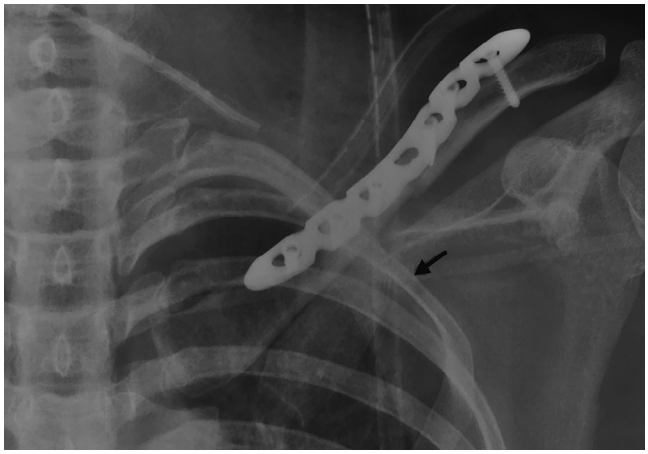

Fig. 3 – Postoperative x-ray of neck showing the second rib deformity caused by the lump's perennial compression.

(6.5%), arm (6.5%), and abdominal cavity or retroperitoneum (5.9%) [4]. In the last 40 years, there have only been 12 cases of hibernomas in the supraclavicular fossa. A review of approximately 80 cases of hibernomas in 1985 showed that only 5 cases were reported in the cervical region before 1976.

Hibernomas progress slowly without obvious tenderness or pain [5]. The pressure symptoms occur due to compression on neighboring structures with tumor enlargement. The first symptomatic case reported was in a 12-year-old girl who presented with chest discomfort, night sweats, shortness of breath, fatigue, and pruritus. She was asymptomatic after excision, and there was no recurrence of symptoms or supraclavicular swelling [6]. There have been only 12 cases of hibernomas in the supraclavicular fossa, and their clinical features are shown in Table 1. Of the 12 patients with hibernomas, 10 cases were in men and 2 in women. The hibernomas in the supraclavicular fossa

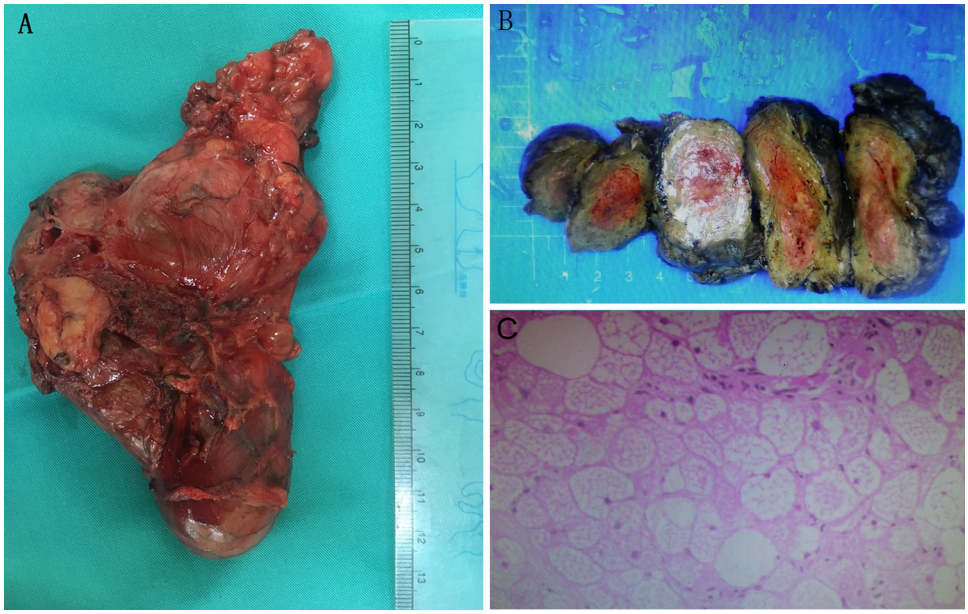

Fig. 4 – (A) Macroscopic view of the specimen. (B) The cut surface of mass: note yellow, fatty, lobulated appearance with focal white tan fibrous tissues. (C) Histologic image: HE × 400: adipose cells with abundant, multivacuolated eosinophilic cytoplasm. HE, hematoxylin and eosin.

Table 1 – Clinical features of reported supraclavicular fossa hibernomas in the past 40 years.

Author(s)/year (ref.)	Age of diagnosis (years)	Sex	Duration	Size (cm)		
				Physical examination	Imaging	Operative specimen
Lawson W and Biller HF/1976 [7]	20	Male	—	—	—	—
Kristensen S/1985 [8]	54	Male	3 mo	6 × 5 × 4	—	—
Hashimoto CH and Cobb CJ/1987 [9]	23	Male	2 y	4 × 10 × 12	—	—
Abemayor E et al/1987 [10]	38	Female	—	—	—	10 × 10 × 3
Abemayor E et al/1987 [10]	21	Male	6 mo	10 × 10 × 6	—	—
Florio G et al/2000 [11]	23	Male	—	—	—	—
Carinci F et al/2001 [12]	41	Male	5 mo	—	—	3 × 3 × 2
Ahmed SA and Schuller I/2008 [6]	12	Female	2 mo	2 × 2	—	—
Peycru T et al/2009 [13]	43	Male	2 y	—	7.6	—
Khattala K et al/2013 [14]	2	Male	6 mo	—	4.6 × 6.9 × 9.1	—
Nardi CE et al/2013 [15]	1	Male	—	6 × 4	—	—
Nardi CE et al/2013 [15]	36	Male	40 d	5	—	—

occurred most commonly in young adults, with a median age of 23 years (age range, 1-54 years).

In most cases of fracture, the imaging examinations can result in a confident diagnosis. However, CT and magnetic resonance imaging findings of a hibernoma are similar to other adipocyte tumors, such as adult rhabdomyoma, granular cell tumor, lipoma, and liposarcoma. A remarkable difference between these tumor types is that hibernomas are well vascularized, as observed on computed tomography angiography in the present case. The most effective method for actual diagnosis is pathology. Considering that most clavicular fossa lumps are inflammatory masses or enlarged lymph nodes, a puncture biopsy such as fine needle aspiration is always recommended before treatment. However, severe bleeding that can even lead to hemorrhagic shock can occur during this invasive manipulation if it is a hibernoma. Therefore, it is important to determine the blood supply, when imaging presents an adipocyte tumor. There has never been a report of recurrence worldwide after complete surgical excision.

REFERENCES

[1] Lynch DT, Dabney RS, Andrews JM. Intraosseous hibernoma or unusual location of brown fat. J Hematop 2013;6:151–3.
[2] Zayet MK, Eiid SB. Multiple fibromyxomas of the jaws: a case report. Imaging Sci Dent 2014;44:237–41.
[3] Liu W, Bui MM, Cheong D, Caracciolo JT. Hibernoma: comparing imaging appearance with more commonly encountered benign or low-grade lipomatous neoplasms. Skeletal Radiol 2013;42:1073–8.
[4] Furlong MA, Fanburg-Smith JC, Miettinen M. The morphologic spectrum of hibernoma: a clinicopathologic study of 170 cases. Am J Surg Pathol 2001;25:809–14.
[5] Lath N, Familua O, Adu A, Oluwole S. Massive abdominal wall hibernoma: case report and literature review of a rare soft-tissue tumor. J Natl Med Assoc 2011;103:372–4.
[6] Ahmed SA, Schuller I. Pediatric hibernoma: a case review. J Pediatr Hematol Oncol 2008;30:900–1.
[7] Lawson W, Biller HF. Cervical hibernoma. Laryngoscope 1976;86:1258–67.
[8] Kristensen S. Cervical hibernoma. Review of the literature and a new case. J Laryngol Otol 1985;99:1055–8.
[9] Hashimoto CH, Cobb CJ. Cytodiagnosis of hibernoma: a case report. Diagn Cytopathol 1987;3:326–9.
[10] Abemayor E, McClean PH, Cobb CJ, Hashimoto CH. Hibernomas of the head and neck. Head Neck Surg 1987;9:362–7.
[11] Florio G, Cicia S, Del Papa M, Carnì D. Neck hibernoma: case report and literature review. G Chir 2000;21:339–41.
[12] Carinci F, Carls FP, Pelucchi S, Grandi E, Hassanipour A, Pastore A. Hibernoma of the neck. J Craniofac Surg 2001;12:284–6.
[13] Peycru T, Tardat E, Schwartz A, Dufau JP, Benois A, Durand-Dastes F. Hibernoma of the neck: a rare benign tumour. Can J Surg 2009;52:E52–3.
[14] Khattala K, Elmadi A, Bouamama H, Rami M, Bouabdallah Y. Cervical hibernoma in a two year old boy. Pan Afr Med J 2013;16:27.
[15] Nardi CE, Barreto L, Carvalho LV, Guimarães AV. Cervical hibernoma and lipoblastomatosis. Einstein (Sao Paulo) 2013;11:111–3.