



A Case Report of Axillary Hibernoma: US, CT, MR, and Histopathologic Findings

액와부 갈색지방종의 증례 보고: 초음파, 컴퓨터단층촬영, 자기공명영상, 병리 소견

Ji Yeon Park, MD¹ , Seong Yoon Yi, MD^{2*} ,
Ji Young Lee, MD¹ , Tae Jung Kwon, MD³ 

¹Department of Radiology, Inje University Ilsan Paik Hospital, Goyang, Korea

²Division of Hematology-Oncology, Department of Internal Medicine, Inje University Ilsan Paik Hospital, Goyang, Korea

³Department of Pathology, Myongji Hospital, Hanyang University College of Medicine, Goyang, Korea

Hibernoma is a rare benign tumor of brown adipose tissue. Herein, we report a case of axillary hibernoma in a 53-year-old female and discuss the various radiologic findings. The US revealed a 4.5-cm well-defined oval heterogenous hyperechoic mass in the right axilla with anterior displacement of the axillary vessels. Non-enhanced chest CT showed a 5.0-cm well defined, oval, and low-attenuated mass. MRI demonstrated a 5.5-cm mass with heterogeneous intermediate-to-high signal intensity on T1-and T2-weighted images and irregular enhancement at the peripheral portion. The patient underwent an US-guided core needle biopsy and the final diagnosis was hibernoma.

Index terms Hibernoma; Ultrasound; Computed Tomography, X-Ray; Magnetic Resonance Imaging

INTRODUCTION

Hibernoma is a rare benign tumor consisting of brown fatty tissue. It occurs predominantly in young adults and at sites where brown fat persists beyond fetal life. The most common site is the thigh, followed by the trunk, upper extremity and head and neck (1). There are only a few reports presenting US, CT and MR imaging findings of axillary hibernoma (2-4). We report herein US, CT and MR findings and pathologic features of axillary hibernoma in a 53-year-old female.

Received February 11, 2021

Revised May 21, 2021

Accepted June 4, 2021

*Corresponding author

Seong Yoon Yi, MD

Division of Hematology-Oncology,
Department of Internal Medicine,
Inje University Ilsan Paik Hospital,
170 Juhwa-ro, Ilsanseo-gu,
Goyang 10380, Korea.

Tel 82-31-910-7200

Fax 82-31-910-7219

E-mail dr-yi@paik.ac.kr

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID iDs

Ji Yeon Park 

<https://orcid.org/0000-0002-4933-0292>

Seong Yoon Yi 

<https://orcid.org/0000-0002-5468-3674>

Ji Young Lee 

<https://orcid.org/0000-0002-6099-601X>

Tae Jung Kwon 

<https://orcid.org/0000-0003-0918-7847>

CASE REPORT

A 53-year-old female visited our hospital, owing to discomfort for more than a year's duration in right axillary area. She has no associated pain or functional limitation. She had been undergoing hormone replacement therapy. Her laboratory data showed normal complete blood count, urine analysis, and biochemical profile results. Axilla US revealed a 4.5-cm well-defined oval heterogenous hyperechoic mass in the right axilla with anterior displacement of axillary vessels and mild intralesional vascularity. Non-enhanced chest CT showed a 5.0-cm well defined oval mass with homogeneous hypodensity (10 Hounsfield unit) compared with the muscle in the right axilla, between subscapularis and pectoralis. MRI demonstrated a 5.5-cm mass of signal intensity intermediate between those of muscle and fat on T1-weighted image, high signal intensity on T2-weighted image and prominent signal void. This mass showed heterogeneous and irregular enhancement at the peripheral portion (Fig. 1A-C). The imaging findings were inconsistent with simple lipoma. The possibility of malignant tumor such as liposarcoma, peripheral nerve sheath tumor, or metastasis was considered. The physician decided to confirm the pathology and the radiologist performed US-guided 18-gauge core needle biopsy of the axillary mass without complication. Microscopic examination of the tumor showed organoid arrangement of uniform large cells resembling brown fat with coarsely granular to multivacuolated cytoplasm, often with mixtures of white fat, and a small nucleus with no atypia. These findings were consistent with hibernoma (Fig. 1D).

This study was approved by the Institutional Review Board and the requirement for informed consent was waived (IRB No. 2021-06-017).

DISCUSSION

Hibernoma is a rare benign tumor of brown fatty tissue. Normally, brown fat is present in the fetus and infant, but gradually decreases through adulthood, until it accounts for only 1% of the adult human body mass (2). Although seen at all ages, hibernomas usually occur in the 3rd and 4th decades, and is more frequent in male than in female. This tumor usually arises in the lower extremities (33%), trunk (23%), upper extremities (22%), head and neck (13%) and abdomen and retroperitoneum (9%). Axilla hibernoma is uncommon (1).

There have been many reports presenting imaging findings of hibernoma in the lower extremities. US revealed a well circumscribed hyperechoic mass relative to the subcutaneous fat, MRI demonstrated slight hypointensity relative to subcutaneous fat or isointensity on T1-weighted image, hyperintensity on T2-weighted image with incomplete fat saturation, subtle enhancement and prominent central vessels (5-7). However, only a few case reports of the radiologic findings of axillary hibernoma have been published thus far. Routine radiography has demonstrated faint soft tissue lesion or swelling without calcification or bony erosion (2). US has shown hyperechoic mass and hypervascularity on Doppler imaging (3, 8). CT has revealed fluid-attenuated mass and variable enhancement, probably due to the close association of the fatty component and the capillary net (2, 3). Similarly, our case showed fluid density on unenhanced CT and heterogeneous hyperechoic mass on US.

Honoki et al. (9) reported that both T1- and T2-weighted MR images showed relatively ho-

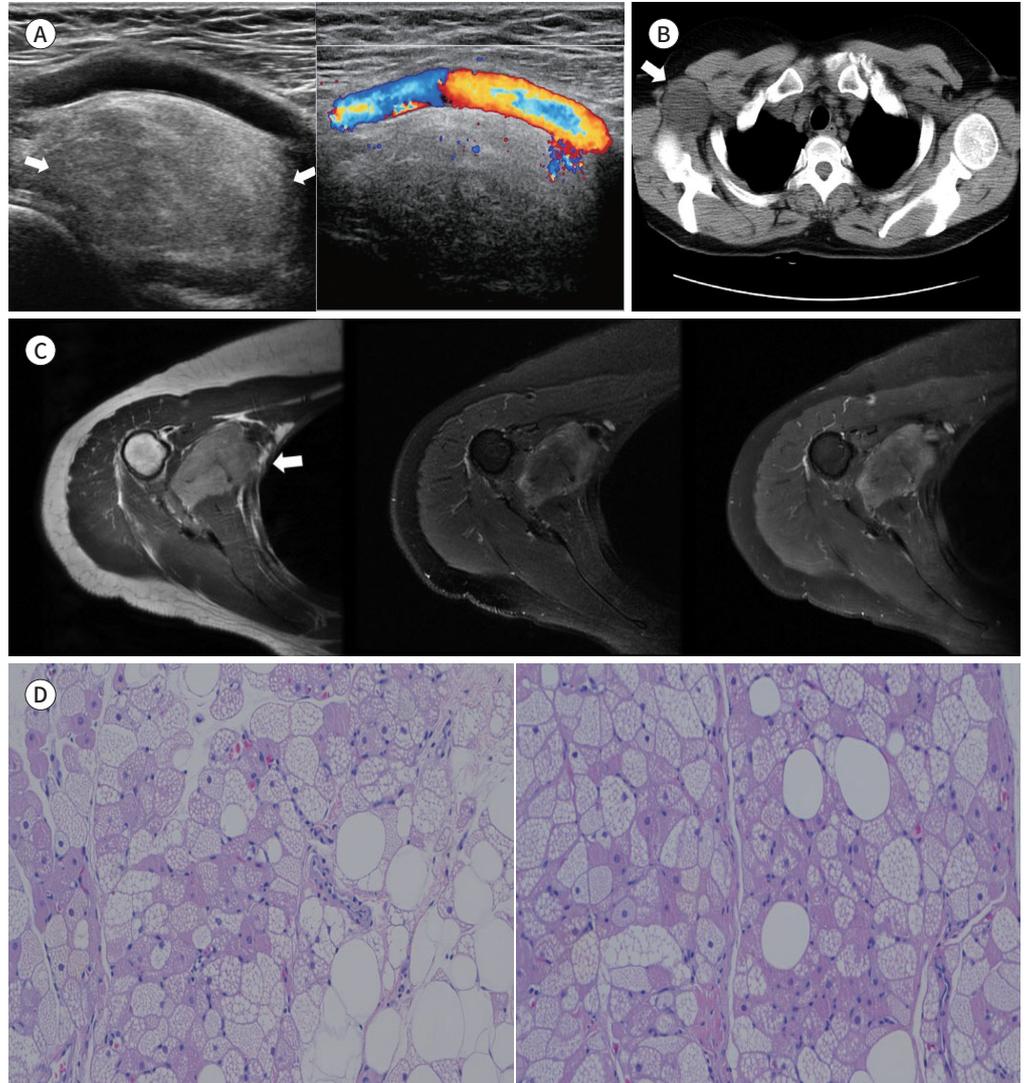
Fig. 1. An axillary hibernoma in a 53-year-old female patient.

A. Axillary US reveals a 4.5-cm mass (arrows) with well-defined oval heterogenous hyperechogenicity (left), with anterior displacement of axillary vessels (right).

B. Non-enhanced chest CT shows a well-defined oval hypodense mass (arrow) in the right axilla, between subscapularis and pectoralis.

C. MRI demonstrates a 5.5-cm mass (arrow) with heterogeneous intermediate to high signal intensity on T1- and T2-weighted images (left, middle) and prominent flow void. This mass shows heterogeneous and irregular enhancement at the peripheral portion (right).

D. Microscopic finding shows that the tumor is composed of univacuolated cells and round or polygonal cells with granular or multivacuolated lipid-containing cytoplasm. Small nuclei are also observed (hematoxylin and eosin stain, $\times 100$).



mogenous high signal intensity that was not suppressed in fat-suppression imaging. However, there were two cases with intermediate signal intensity between skeletal muscle and subcutaneous fat on T1-weighted image and they showed heterogeneous increased signal intensity on T2-weighted image (3, 4). Prominent flow voids were noted in the periphery of the mass (3). The MR findings of our case were similar to previous reports (3, 4), and showed heterogeneous enhancement after contrast injection. Unlike simple lipoma, hibernomas do

not demonstrate signal intensity indicative of subcutaneous fat on both T1- and T2-weighted images, probably due to intermixing of vascular tissue with the fatty component (3). Therefore, many differential diagnosis have been suggested, based on imaging findings, such as benign diseases and malignant diseases including liposarcoma as well.

Two studies have reported angiographic findings of axillary hibernoma and showed extensive vascularization of the mass with large feeding vessels (2). Therefore, core needle biopsy has not been recommended in cases with suspected hibernoma, due to this tumor's hypervascularity (10). However, in the present case, the physician and radiologist did not consider the possibility of hibernoma, because axillary hibernoma is very uncommon and our case did not clearly suggest benign lipoma on CT and MR. The US-guided core biopsy was successfully completed without complication, and the mass was confirmed as hibernoma.

The curative treatment of hibernomas is complete excision. Local recurrence or evidence of aggressive behavior has not been reported, even in a case of incomplete excision (1).

In this report, we presented various US, CT, and MR findings of axillary hibernoma in a 53-year-old female. Although hibernomas is very uncommon, it should be included for differential diagnosis of the axillary mass. Greater knowledge and awareness of imaging findings may help to suggest hibernoma in early diagnosis.

Author Contributions

Conceptualization, Y.S.Y.; data curation, P.J.Y.; formal analysis, P.J.Y.; investigation, P.J.Y.; methodology, Y.S.Y.; project administration, P.J.Y.; resources, P.J.Y.; supervision, Y.S.Y.; validation, L.J.Y.; visualization, K.T.J.; writing—original draft, P.J.Y.; and writing—review & editing, P.J.Y.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Funding

None

REFERENCES

1. Furlong MA, Fanburg-Smith JC, Miettinen M. The morphologic spectrum of hibernoma: a clinicopathologic study of 170 cases. *Am J Surg Pathol* 2001;25:809-814
2. Balestreri L, Canzonieri V. Case report: axillary hibernoma—radiological and pathological findings of a rare tumour. *Clin Radiol* 1998;53:853-855
3. Kallas KM, Vaughan L, Haghighi P, Resnick D. Hibernoma of the left axilla; a case report and review of MR imaging. *Skeletal Radiol* 2003;32:290-294
4. Lee TJ, Park IS, Kim MG, Cho KJ, Moon KH, Lim KY. Axillary hibernoma: MRI characteristics: a case report. *J Korean Orthop Assoc* 2004;39:335-338
5. Kim AC, Sheikh A, Dharmadhikari R, Gravel D, Rakhra K, Di Primio G, et al. Hibernoma—a case series with multimodality imaging and pathologic correlation. *Bull NYU Hosp Jt Dis* 2012;70:283-287
6. Ritchie DA, Aniq H, Davies AM, Mangham DC, Helliwell TR. Hibernoma—correlation of histopathology and magnetic-resonance-imaging features in 10 cases. *Skeletal Radiol* 2006;35:579-589
7. Hertzanu Y, Mendelsohn DB, Louridas G. CT findings in hibernoma of the thigh. *J Comput Assist Tomogr* 1983;7:1109-1111
8. Sertkaya M, Emre A, Baykara M, Baykara M, Kale IT. A rare tumor of the fatty tissue in the axilla; hibernoma. *Surg Chron* 2019;36-38
9. Honoki K, Morita K, Kasai T, Fujii H, Kido A, Tsukamoto S, et al. Hibernoma of the axillary region: a rare benign adipocytic tumor. *Rare Tumors* 2010;2:e7

10. Lateur L, Van Ongeval C, Samson I, Van Damme B, Baert AL. Case report 842. Benign hibernoma. *Skeletal Radiol* 1994;23:306-309

액와부 갈색지방종의 증례 보고: 초음파, 컴퓨터단층촬영, 자기공명영상, 병리 소견

박지연¹ · 이성윤^{2*} · 이지영¹ · 권태정³

갈색지방종은 갈색지방조직의 드문 양성 종양이다. 저자들은 53세 여자 환자에서 액와부 갈색지방종의 다양한 영상 소견을 보고하고자 한다. 초음파에서 오른쪽 액와부에 4.5 cm의 경계가 분명한 타원형의 비균질한 고에코의 종괴였으며, 액와부 혈관들을 앞쪽으로 전위시키고 있었다. 조영 전 흉부 단층촬영에서 5 cm의 경계가 분명한 타원형의 저감쇠의 종괴로 보였다. 자기공명영상에서는 T1과 T2 강조영상에서 비균질한 중간 및 고신호강도의 5.5 cm 종괴였으며, 변연부에서 불규칙한 조영증강을 보였다. 환자는 초음파유도중심부바늘생검을 받아 최종적으로 갈색지방종으로 진단되었다.

인제대학교 일산백병원 ¹영상의학과, ²혈액종양내과,
³한양대학교 명지병원 병리과