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● *Review*

IMAGING FINDINGS OF VARIABLE AXILLARY MASS AND AXILLARY LYMPHADENOPATHY

Sung Hee Park,* Yu Mi Jeong,† So Hyun Cho,† Hyun Kyung Jung,‡ Soo Jin Kim,* and Han Suk Ryu§

*Department of Radiology, Chung-Ang University Hospital, Seoul, Korea; †Department of Radiology, Gachon University Gil Hospital, Incheon, Korea; ‡Department of Radiology, Inje University Haeundae Paik Hospital, Busan, Korea; and §Department of Pathology, Seoul National University Hospital, Seoul, Korea

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Abstract—The axilla is a triangular space that contains mesenchymal tissues such as fat, vessels, nerves and lymph nodes, from which various diseases can develop. This article describes axillary masses and axillary lymphadenopathies using imaging findings from techniques such as ultrasonography, mammography, computed tomography and magnetic resonance imaging. Awareness of the characteristic imaging findings of disease entities that cause axillary masses and various axillary lymphadenopathies will help in the accurate diagnosis of axillary lesions. (E-mail: sungheeparkmd@gmail.com) **© 2014 World Federation for Ultrasound in Medicine & Biology.**

Key Words: **Axilla, Mass, Lymphadenopathy, Ultrasound, Hemangioma, Lymphangioma, Neurogenic tumor, Kikuchi, *Toxoplasma*, Tuberculous, Metastatic.**

INTRODUCTION

The axilla contains mesenchymal tissues, such as fat, vessel, nerves and lymph nodes, from which various diseases can develop. The most common axillary masses are lymph node metastases from breast cancer. Axillary masses arising from soft tissues other than lymph node metastasis are rare, but should be considered in a differential diagnosis. The purpose of this article is to present a spectrum of various axillary masses and axillary lymphadenopathies with their correlative imaging findings, as confirmed by pathologic examinations or pathognomonic findings. Awareness of the characteristic imaging findings of disease entities that cause axillary masses and axillary lymphadenopathies will aid in the accurate diagnosis of axillary lesions.

AXILLA ANATOMY

The axilla is a pyramid-shaped space between the upper part of the arm and the side of the chest, the apex of which is directed toward the neck while the base is directed downward. The boundaries of the axillae consist of several chest walls, fascia and bones (Fishman et al. 1986). The axillary space contains the trunks of the brachial plexus and the axillary artery and vein. Several nodal groups drain lymphatics from the breast. Axillary lymph nodes are divided into levels I, II and III. Level I lymph nodes are located at the lateral border of the pectoralis minor muscle, level II nodes are in the mid-region and level III nodes are at the apex near the medial area of the pectoralis minor muscle.

METHODS

The institutional review board approved this retrospective study, and the requirement to obtain informed consent was waived. Cases were collected among lesions that were initially assessed on sonography, and the pathology results were confirmed by sonographically guided core needle biopsy or surgical excision at our institution.

IMAGING EVALUATIONS

Cavernous hemangioma

Cavernous hemangiomas are the most common benign vascular tumor, but cavernous hemangiomas of

Address correspondence to: Sung Hee Park, MD, Department of Radiology, Chung-Ang University Hospital, Chung-Ang University College of Medicine, 102 Heukseok-ro, Dongjak-gu, Seoul 156-755, Korea. E-mail: sungheeparkmd@gmail.com

the breast are rare and are even rarer in the axillary region (Bellina 1982). Cavernous hemangiomas consist of dilated blood vessels lined with single endothelial cells. Microscopically, hemangiomas consist of thin-walled, blood-filled, anastomosing vascular spaces separated by fibrous septa with extensive fibrosis and phleboliths. Hemangiomas have dilated vascular channels varying considerably in size from capillary to cavernous, and are formed by endothelial cells. These hemangiomas are usually located superficially, either subdermally or within subcutaneous tissue. The typical clinical presentation is a superficial palpable mass with or without skin erythema or discoloration. Ultrasonography (US) reveals a circumscribed hypoechoic solid mass with a multilobulated margin. A cavernous hemangioma can appear iso-echoic or hyper-echoic or with heterogeneous echotexture. The degree of echogenicity depends on the dominant size of the vascular channels, which may have internal septations and calcification. Diagnoses of hypovascularity with a single vascular pole are usually associated with benign lesions; hyper-vascularity with multiple peripheral poles is more common in malignant lesions. A well-differentiated angiosarcoma may resemble a hemangioma. Lesion size is important to distinguish hemangiomas from angiosarcomas because angiosarcomas are rarely smaller than 2 cm (Jozefczyk and Rosen 1985; Rosen 1985). Our case showed that cavernous hemangiomas appear as multilobulated hypo-echoic masses with internal septation on US, lobulated hyperdense masses on mammography, and multilobulated margined masses with little enhancement on enhanced computed tomography (CT) (Fig. 1). The diagnosis can

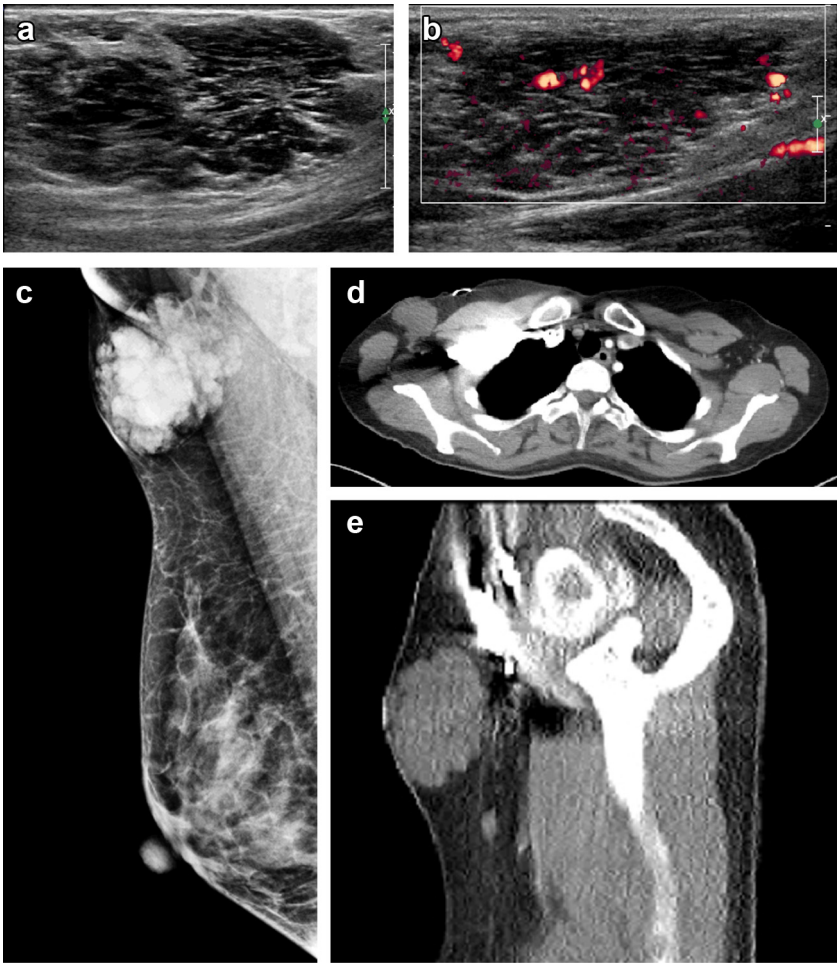

Fig. 1. Cavernous hemangioma in a 39-y-old woman. (a, b) Ultrasonography revealed a multi lobulated hypo-echoic mass located underneath the dermis, with heterogeneous parenchymal echotexture and focal hyper-vascularity. The mass consisted of innumerable thin, channel-like structures with mild posterior acoustic enhancement on US. (c) Mammography revealed a multilobulated margined mass with low to high density in the right axilla. (d, e) Enhanced axial and sagittal chest computed tomography images also revealed a multilobulated margined hypo-dense mass with little enhancement in the right axilla.