
CASE REPORT

Osseous Metaplasia of the Breast: Diagnosis with Stereotactic Core Biopsy

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■ **Abstract:** There are approximately 200 reported cases of breast tumors containing areas of bone. The majority of the neoplasms are sarcomas, phylloides tumors, or fibroadenomata. We present a case of osseous metaplasia mammographically detected by clustered heterogeneous calcifications. Stereotactic core biopsy revealed the presence of well-formed bone tissue without associated neoplasia. The case represents the first reported case of mammographically detected osseous metaplasia confirmed by core biopsy. ■

Key Words: stereotactic core biopsy, osseous metaplasia, mammography

A 37-year-old woman presented for her first screening mammogram. She underwent hysterectomy for an early stage endometrial cancer 2 years prior. She received no postoperative irradiation or chemotherapy and was asymptomatic. She had no history of trauma, previous breast surgery, collagen vascular disease, or any other pertinent medical conditions. The routine mammogram

and additional magnified images revealed what were thought to be a suspicious cluster of calcifications in the upper inner quadrant of the anterior left breast (Fig. 1). The patient subsequently underwent stereotactic 11-gauge vacuum-assisted core biopsy (Fig. 2), which showed that the supposed calcifications in the fatty breast tissue were bone (Fig. 3). Microscopic examination demonstrated no signs of malignancy.

Postprocedure mammogram showed the clip and no residual densities. Follow-up mammogram was recommended in 1 year.

DISCUSSION

Pathologic ossification has to be differentiated from simple dystrophic calcification (deposition of lime in dead or degenerating tissues) or metastatic calcification (precipitation of calcium salts caused by an excess in circulating blood).

The finding of extraskelatal bone in soft tissue has been recognized since the early 18th century (1). Extraskelatal osseous metaplasia can occur anywhere in the soft tissue and is a well-recognized entity. Etiologies include trauma, posttraumatic hematoma, and soft-tissue tumors, especially slow-growing types and tumors treated by radiation. Metaplastic osseous lesions may

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Figure 1. Left breast crano-caudal focal compression view. High-density branching-type calcifications suggest that the lesion can be high-grade intraductal carcinoma.

resemble neoplasms in the clinical and imaging appearances and may cause a diagnostic dilemma (2).

In order to explain the pathogenesis of formation of bone within tumors, Virchow first published in 1863 that bone may arise by metaplasia from fibroblasts (3). He regarded the osteoblast as a modified fibroblast. The origin of metaplastic bone is like the development of normal bone. It may originate either directly from fibrous tissue or may be secondary to cartilage formation. In human breast tissue, the incidence of bony lesions is rare if compared with those of other mammals, especially with canine mammary lesions. Interestingly, in bitches, there is a strikingly high incidence of cartilaginous and osseous metaplasia in breast tumors (4).

It is generally agreed that bone in breast tissue occurs in a variety of human mammary lesions and may have more than one mechanism of formation.

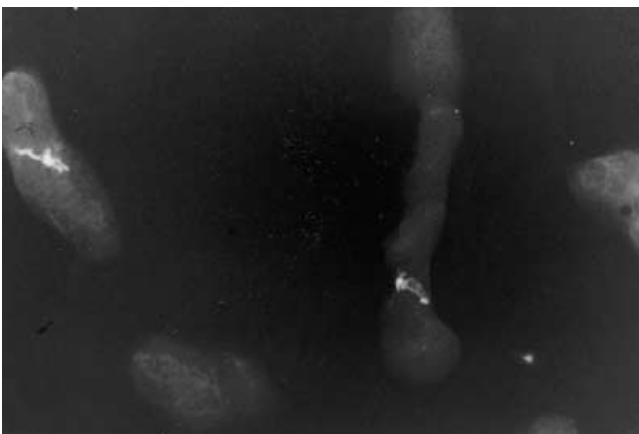


Figure 2. A core biopsy specimen radiograph shows the removed calcifications.



Figure 3. Breast tissue with a focus of bone formation (thick arrows) and calcification (thin arrow) (hematoxylin and eosin, original magnification $\times 200$).

Smith and Taylor divided the cartilage- and bone-containing tumors of the breast into four groups having different therapeutic and prognostic significance (5). These are as follows: (a) lesions similar in appearance to mixed tumors of the salivary gland, (b) cystosarcoma phylloides with bone as stromal component, (c) stromal sarcomas, and (d) adenocarcinoma with osseous metaplasia. Bone has also been reported in association with fibroadenoma (6), papilloma (7), and amyloid tumors (8,9). Our case is unique. Pure osseous metaplasia does not fit in any of these categories. To our knowledge, imaging findings of nonneoplastic osseous metaplasia of the breast were reported only once (10). The mammograms in this case showed extensive focal ossification of both breasts in association with chronic nonspecific mastitis.

Imaging findings of osseous metaplasia in breast neoplasms have been reported in the literature. The findings basically depend on the nature of the underlying neoplasm. Mammogram and sonogram demonstrate a well-defined, oval lesion with coarse calcifications in a case of fibroadenoma or cystosarcoma phylloides (6). Osteogenic sarcoma and ductal carcinoma with osseous metaplasia can present as a circumscribed mass with dense calcifications resembling fibroadenoma (11–13). In some reported malignant tumors, spiculated, malignant-looking appearances were observed (14,15).

SUMMARY

Our case was an asymptomatic 37-year-old woman with no detectable associated neoplasm or underlying medical condition. Diagnosis and removal of the

metaplastic bony lesion were achieved by stereotactic core biopsy.

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