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Case Report

Glass shards masquerading as calcifications in the breast: A case report[☆]

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ABSTRACT

Noniatrogenically acquired foreign bodies in the nipple-areola complex or breast skin are rare and can have variable imaging features, depending on the nature of the foreign material. We present the case of a 41-year-old female who had numerous apparent round and punctate calcifications in the right periareolar breast, predominantly within the skin. The biopsy showed multiple glass shards on a background of scar tissue. Further discussion with the patient confirmed that the glass shards were acquired during a motor vehicle accident several years earlier. We also review the types of foreign body material observed in the breast, the imaging appearance of glass foreign bodies in soft tissue, and methods of removal.

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Introduction

The most common foreign materials found in the breast are iatrogenically acquired metallic bodies, such as clips placed during/after biopsy or surgical procedures, or fragments of localization wires [1]. Other foreign bodies that have been encountered occasionally in the breast include gunshot material, sewing needles, pencil lead fragments, and pieces

of broken glass [1–4]. While the Radiology literature mentions glass as a potential foreign body in the breast, there are few reports that provide patient examples. Kopic described a case of dense focal asymmetry on mammography, with biopsy revealing a piece of glass surrounded by inflammation and fibrosis [5]. Our case is a unique example of glass shards masquerading as breast calcifications, requiring a multidisciplinary approach to diagnosis.

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Case report

Screening mammogram of a generally healthy 41-year-old female revealed calcifications in the periareolar region of the right breast (Fig. 1), and no abnormalities in the left breast. These calcifications were present on her prior baseline screening mammogram but were less conspicuous on the prior study due to mild motion artifact. She was at average risk for breast cancer, with no personal history of breast malignancy. The patient underwent additional imaging, with magnification views of the right anterior breast demonstrating numerous apparent round and punctate calcifications in a regional distribution in the right subareolar breast (Fig. 2). Correlation with full field CC and ML tomosynthesis images indicated that these apparent periareolar calcifications were predominantly in the skin, with extension into the nipple. Diagnostic ultrasound was not performed as there was no concern for mass or asymmetry. The patient denied a history of tattoos to the right breast and

was asymptomatic at the time of evaluation. The patient was referred to Dermatology for a skin biopsy.

Because there was no visible or palpable abnormality overlying the radiographic abnormality, a breast radiologist utilized the screening and diagnostic mammograms to localize the skin microcalcifications, thus playing a crucial role in identifying and marking the optimal site for skin biopsy (Fig. 3). The patient then underwent an incisional biopsy of the marked site. Radiograph of the biopsy specimen demonstrated numerous apparent punctate and pleomorphic calcifications (Fig. 4). Histopathological evaluation of the biopsy specimen showed multiple small but variably-sized fragments of foreign material, some with an angulated and refractile appearance consistent with glass shards (Figs. 5A–C) on a background of scar. Follow up discussion with the patient revealed that she sustained a motor vehicle accident several years earlier, with trauma to the chest. The pathological findings were therefore thought to represent glass shards from the shattered windshield.

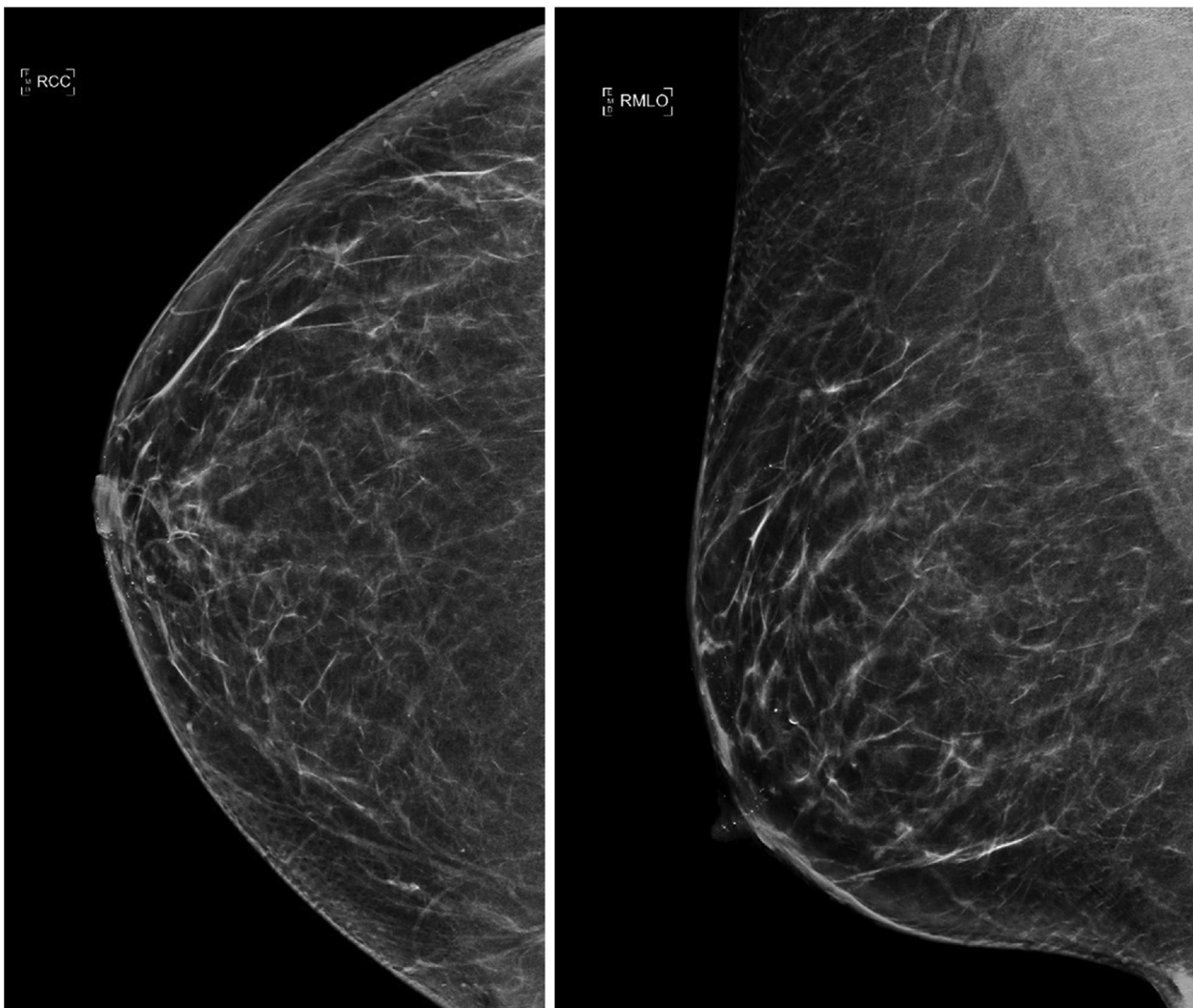


Fig. 1 – Right craniocaudal (CC) and mediolateral oblique (MLO) images from screening digital mammogram demonstrate apparent calcifications in the periareolar region of the right breast.

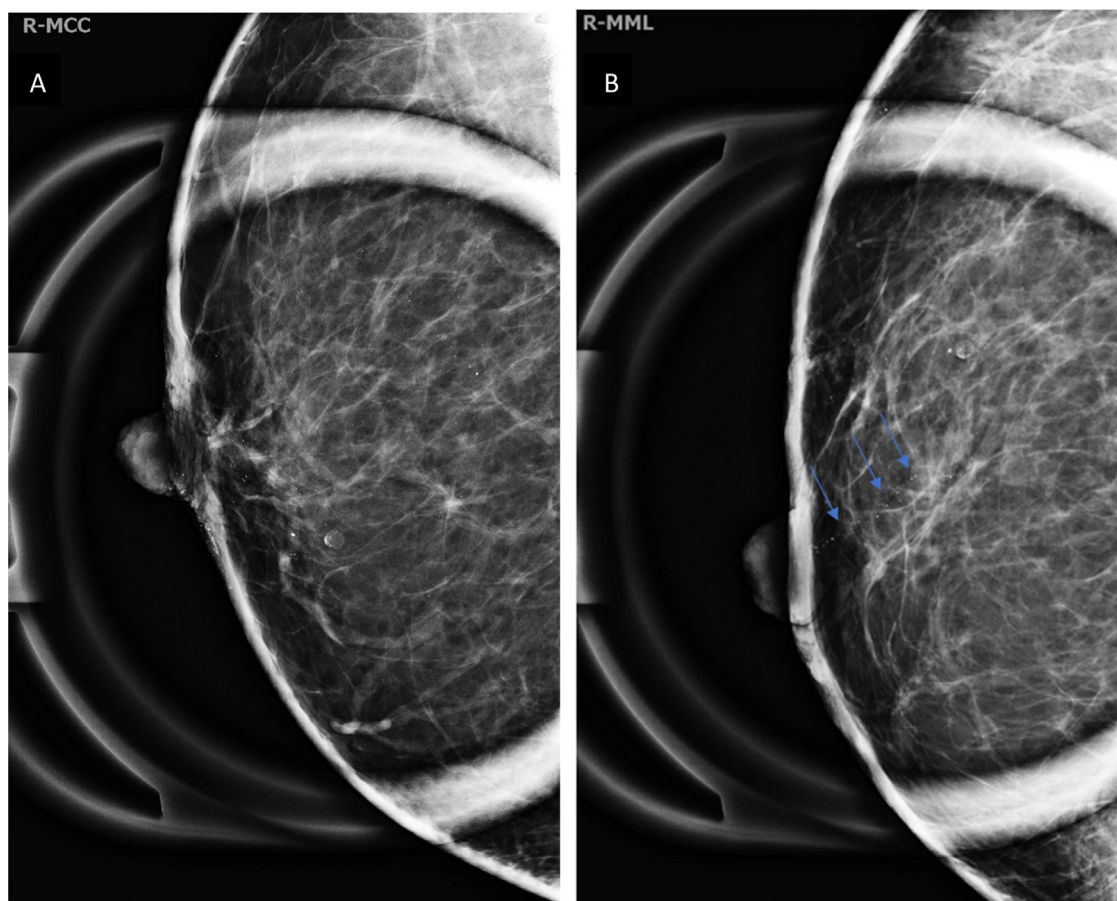


Fig. 2 – Right magnification views in the (A) craniocaudal (CC) and (B) mediolateral (ML) projections from diagnostic digital mammogram further illustrate the appearance of numerous round and punctate calcifications in a regional distribution in the right periareolar breast. Many of these apparent periareolar calcifications are located in the skin with associated extension into the nipple best seen medially on the magnification CC view. Blue arrows indicate the area marked for excisional biopsy.

Discussion

Glass foreign bodies in the breast are rare, typically occurring in the setting of trauma, most commonly during a motor vehicle accident. Kupic described a 61-year-old female who had fragment of glass in her breast, related to ejection through the windshield in a motor vehicle collision when she was 2 years old [5]. Glass foreign bodies have been described in many other areas of the body, with glass representing 9%-24% of all retained foreign bodies [6]. Previously it was thought that visibility of glass in radiographs was related to associated lead or heavy metal content, but that theory has been invalidated [7]. Indeed, most types of glass are radiopaque and thus should be visualized on radiographs, with ease of detection related to the size of the glass fragment [6,8]. Most glass fragments larger than 2mm can be readily detected by radiography [6]. On ultrasound, glass foreign bodies typically appear hyperechoic, with dirty posterior shadow or reverberation artifacts related to their smooth flat surfaces [6,9]. Secondary infections accompanying glass foreign material are uncommon. However,

possible soft tissue laceration due to the sharp angles of glass is a concern, especially if there is a risk of glass migration away from the site of impact.

Depending on composition and potential for harm, foreign bodies in the breast do not necessarily need to be removed. However, retained foreign material may be removed if associated with pain, potential for future harm, or if requested by the patient. Options for removal generally depend on the type of foreign body as well as its size and location within the breast. Surgical excision of a palpable foreign body is typically straightforward. For nonpalpable lesions, wire localization may be indicated to identify the affected location. Alternatively, Parker et al. used the mammotome to remove a retained localization wire, avoiding the need for surgical removal [10]. Aydoğan et al. [1] were the first to employ the radioguided occult lesion localization (ROLL) technique to localize a non-palpable metallic breast foreign body, using perilesional injection of 0.2 mL 99Tcm-labeled macroaggregate albumin (MAA) under mammography guidance. This technique has since been applied to the localization of other types of foreign material [2]. The ROLL technique can be useful in patients



Fig. 3 – Photo of the breast with skin markings about the areola and additional linear blue-ish lines noted about the breast (blue arrows) corresponding to the linear apparent calcifications seen mammographically. Similar blue-ish line was seen in the areolar region, obscured by the pen marking at the site for excisional biopsy, corresponding to the linear region of apparent calcifications marked with blue arrows in [Figure 2B](#).

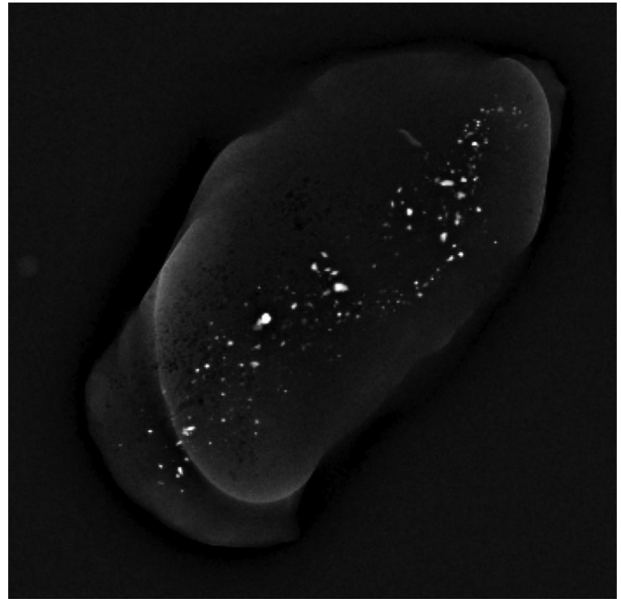


Fig. 4 – Specimen radiograph of the excisional skin punch biopsy sample revealing multiple apparent punctate and pleomorphic calcifications within the skin.

with deeper nonpalpable targets, tends to be more comfortable for the patient, and can be performed the day prior to surgery, allowing for more flexibility.

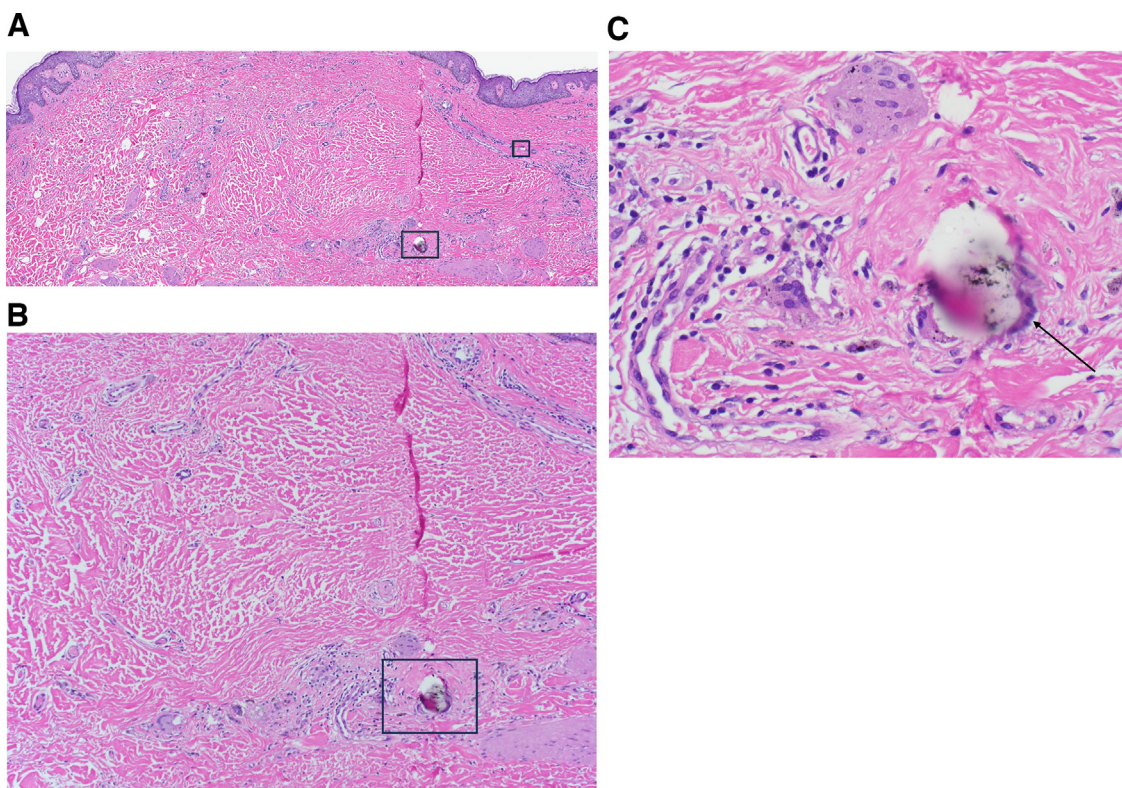


Fig. 5 – (A–C): Skin biopsy showed foreign material (in rectangles) morphologically consistent with glass shards, on a background of scar (H&E x 100, x 200, and x 400 respectively), variably surrounded by a foreign body-type multinucleated giant cell (arrow) (C).

Conclusion

Glass foreign bodies are common and have been found at various anatomic sites but rarely in the breast. Usually acquired during trauma from a motor vehicle accident, glass shards in the breast can have a variable appearance on imaging, depending on their size and shape, but typically are radiopaque and thus visualized on mammography. Nevertheless, a biopsy may be indicated to confirm that the radiographic abnormality is indeed due to foreign material even in a patient with a history of trauma, given nonspecific imaging features that may be similar to those seen with malignancy.

Patient consent

Written, informed consent was obtained from the patient for publication of this case.

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