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Case Report

A Case Report of a Spontaneous Breast Pseudoaneurysm

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Abbreviations

US: ultrasound

CTA: computed tomography
angiography

ABSTRACT

Background

Breast pseudoaneurysms are rare and most commonly associated with iatrogenic causes such as core needle or surgical excisional biopsies. Other causes include blunt force trauma, breast implants, or underlying malignancy. This report describes the presentation and management of a spontaneous breast pseudoaneurysm.

Case Presentation

A 55-year-old female with a past medical history of hypertension and hyperlipidemia presented to the emergency department with sudden onset of a pulsatile left breast mass after a coughing spell. Doppler ultrasound (US) revealed a pulsatile vascular structure with internal arterial waveforms concerning for a breast pseudoaneurysm. The patient underwent a chest computed tomography angiogram (CTA) that confirmed a pseudoaneurysm arising from the left internal mammary artery. Mammography and target ultrasound showed no findings suggestive of underlying malignancy. Conservative management with compression was initiated resulting in partial thrombosis. Repeat doppler US showed persistent internal flow, and therefore, US-guided thrombin injection was performed by vascular surgery with complete thrombosis.

Conclusion

Breast pseudoaneurysms can occur spontaneously and can be managed with both conservative and local invasive interventions.

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Background

Pseudoaneurysms, otherwise known as false aneurysms, are known complications after traumatic injury and vascular catheterizations [1-3]. Breast pseudoaneurysms are extremely uncommon and mainly result from core needle or excisional biopsies [1, 4-6]. The underlying cause amongst all these etiologies is direct transmural vascular injury with subsequent leakage of blood that remains contained and in communication with the arterial flow. In contrast to aneurysms, pseudoaneurysms lack the three layers of the blood vessel wall and instead occur between the media and adventitial layers. On clinical

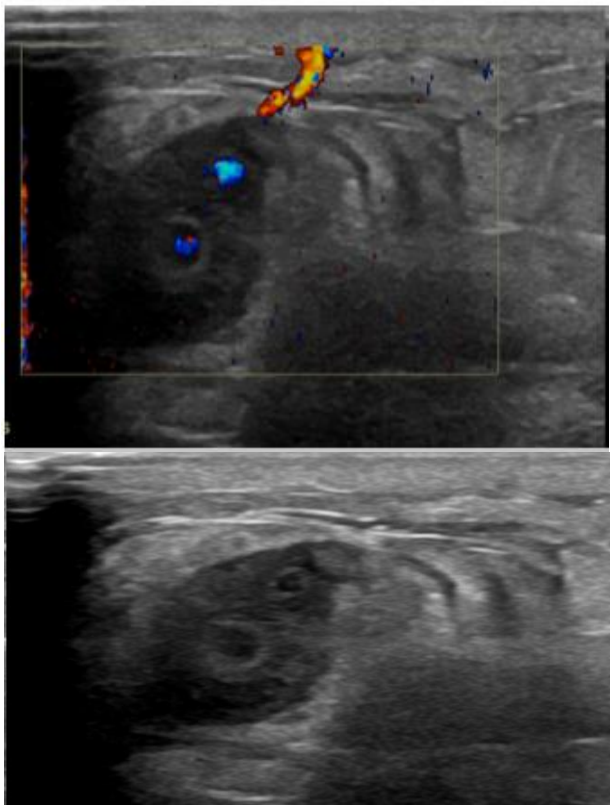
presentation, the patient often describes an enlarging, pulsatile and painful mass with some history of penetrating or blunt trauma to the area.

Breast pseudoaneurysms typically arise from the internal mammary artery, or a branch off this vessel. While uncommon, breast pseudoaneurysms have been reported in the literature most frequently secondary to core needle biopsies [1, 4, 5]. Other etiologies reported include blunt force trauma to the breast, history of breast implants, and underlying malignancy [6, 7, 8]. There have only been two other reported cases in the literature of spontaneous breast pseudoaneurysms [9, 10].

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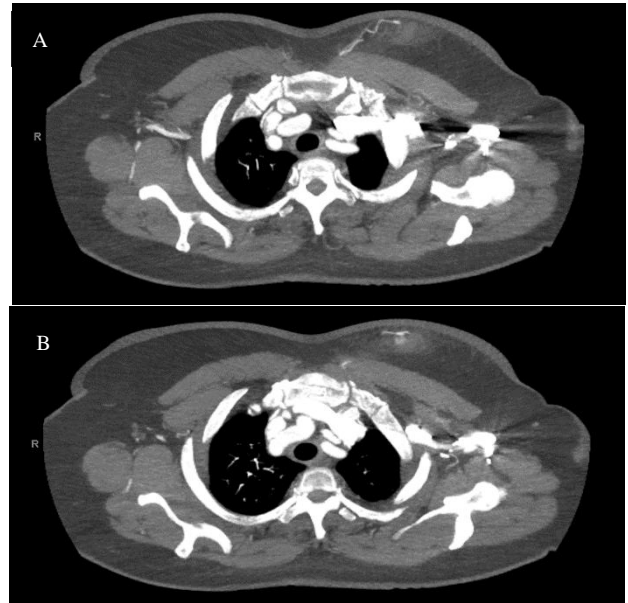
Case Presentation

A 55-year-old female with a significant past medical history of hypertension and hyperlipidemia, presented to the emergency department for evaluation of a pulsatile left breast mass that developed four days prior to admission. The patient initially noticed the breast mass after a coughing spell. She delayed treatment for 4 days, but when the mass did not resolve, the patient came for evaluation. On presentation, she denied a history of trauma to the breast or any breast biopsies. Her vitals were stable. On physical exam there was a palpable, pulsatile mass at the 11 o'clock axis in the left breast, 4 cm from the nipple. A bruit could be heard in the mass with a stethoscope. Doppler US of the mass revealed a bilobed structure with internal arterial waveforms concerning for a pseudoaneurysm with a surrounding hematoma (Figure 1). The patient subsequently underwent a chest CTA which confirmed the presence of a pseudoaneurysm arising from the proximal left internal mammary artery (Figure 2). During the first day of hospital admission, conservative management was initiated with local compression. A doppler US on hospital day 2 revealed partial compression, and local compression was continued for a second day. However, repeat doppler US on hospital day 3 revealed only partial thrombosis with persistent flow in the mass. The vascular surgery team proceeded with US guided thrombin injection resulting in cessation of vascular flow and complete thrombosis (Figure 3). She remained hemodynamically stable with stable daily hemoglobin levels (11.6, 10.8, 10.8, respectively). The patient was discharged home with follow-up in our breast surgery clinic.



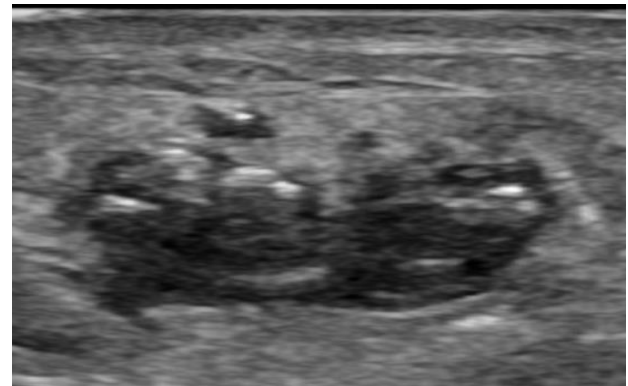
Doppler ultrasound of the left upper chest showing 2 pulsatile vascular structures and internal arterial waveforms consistent with a pseudoaneurysm and a surrounding hematoma

Figure 1: Initial Doppler Ultrasound of the Left Chest Mass



Chest computed tomography angiography axial maximum intensity projection reformats (a-b) showing the feeding artery of the pseudoaneurysm, likely originating from the proximal left internal mammary artery.

Figure 2: Chest Computed Tomography Angiography



Doppler ultrasound after thrombin injection shows abatement of flow and heterogeneous low density within the pseudoaneurysm representing thrombus following therapeutic thrombin injection.

Figure 3: Doppler Ultrasound After Thrombin Injection

Conclusion

While rare, pseudoaneurysms of the breast can occur spontaneously. In both prior case reports of spontaneous breast pseudoaneurysms, the patients had a known medical history of hypertension, suggesting that increased blood pressure might contribute to the pathogenesis of these pseudoaneurysms [9-11]. While the natural history of our patient's pseudoaneurysm remains unknown, the patient reports that the mass developed after a severe coughing spell. We hypothesize that this resulted in a transient increase in blood pressure resulting in trauma to the vascular wall and development of the pseudoaneurysm. More common etiologies include breast trauma or iatrogenic injury from core needle biopsies. Management of pseudoaneurysms of the breast is

similar to that of pseudoaneurysms in other locations in the body using a graduated approach from conservative measures to more invasive interventions. These include initiation of local therapy with compression, followed by US-guided injection with thrombin or alcohol. Surgical intervention is usually reserved for patients without resolution after more conservation measures are employed. We also recommend imaging work-up to evaluation for underlying malignancy. Overall, spontaneous pseudoaneurysms should be included in the differential of sudden onset breast masses since invasive procedures in this setting can lead to potential adverse outcomes.

Declarations

We have no financial disclosures

Ethics Approval

Not applicable

Consent for Publication

Consent was obtained from the patient for publication of this case report

Competing Interests

No competing interests to declare

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None

Authors' contributions

AR assisted in the management of the patient on the floor and writing of the manuscript; SK assisted in editing the manuscript and discussing the patient's management; AL performed the thrombin injection; NG supervised the management of the patient and edited the case report. All authors read and approved the edited the manuscript.

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