

## Pseudoaneurysm of the Breast-A Case Report and Literature Review

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### Abstract

Triple assessment plays an integral role in the investigation of breast disease. Core biopsy is a useful adjunct as it provides definitive histological diagnosis for many abnormalities detected on clinical examination and mammography. Haematoma formation is a well recognised complication of core biopsy and most tend to resolve with conservative management. Pseudoaneurysm of the breast, while described in the literature, is quite rare and tends to occur following core needle biopsy. Both interventional and surgical options are available for the treatment of these pseudoaneurysms. We present the case of a patient who presented with a pseudoaneurysm of her right breast following core biopsy and discuss her subsequent management.

**Keywords:** Pseudoaneurysm; Core needle biopsy; Breast cancer

### Case Report

A 65 year old woman was referred to the Breast Surgery Unit at a local district general hospital for assessment of a right sided breast lump. She first noticed this lump one month ago and it was gradually increasing in size with no associated skin or nipple changes. She had no previous breast symptoms or imaging of her breasts but did report that her sister was diagnosed with breast cancer at age 60. Her past medical history was significant. She was diagnosed with idiopathic pulmonary arterial hypertension for which she was taking warfarin. Her past medical history also included non-insulin dependent diabetes, chronic kidney disease (Stage 3) and hypothyroidism. Her current medication included aripisentan, furosemide, thyroxine and warfarin.

On clinical assessment, she had bilateral breast lumps. On the right, a 2.5 cm lump was palpated at the 3 o'clock position with no associated skin changes. This lump was diffuse with ill-defined borders. There was no associated lymphadenopathy. The symptomatic left sided breast lump was 1.5 cm located at the 9 o'clock position with overlying skin but no associated axillary lymphadenopathy. To complete her triple assessment, she underwent imaging with both mammography and ultrasound.

Mammography confirmed bilateral suspicious lesions (Figure 1). On the right, there was a well defined 29 × 43 × 29 mm well defined mass at the 3 o'clock position with no evidence of multifocality. The left breast lump measured 26 × 25 × 23 mm with features suggestive of malignancy. Under ultrasound guidance, she had core biopsies of these lesions using a 14G automated core biopsy needle. Three cores were obtained on the right. On the left 2 cores were obtained, however, there was significant post procedure bleeding requiring an extended period of compression. She was discharged and reviewed after one week in the outpatient clinic.

At her clinic visit, there was definite evidence of a haematoma in her left breast which made palpation of the cancerous lump difficult. Surgery was deferred for 2 weeks to allow this haematoma to resolve before proceeding

to wide local excision and sentinel lymph node biopsy. Her warfarin was discontinued prior to surgery and low molecular weight heparin prescribed as bridging therapy. Her International Normalized Ratio (INR) level pre-operatively was 1.3.

On the day of surgery, her haematoma was still significant which made palpating the lump difficult. A decision was made to localize the cancer radiologically using ultrasound guidance. This confirmed a 7 mm malignancy (Figure 1) over which a skin mark was placed. However, adjacent to this was a 4.9 × 3.5 cm pulsatile pseudoaneurysm which contained thrombus (Figures 2 and 3).

Intraoperatively, she had a wide local excision of the left sided breast cancer. The artery feeding the pseudoaneurysm was identified and sutured ligated using 2-0 vicryl. A wide local excision was performed on the right side and bilateral sentinel lymph node biopsies were performed. She was discharged the following day with no complications. Pathology confirmed bilateral cancers with free margins and negative sentinel nodes.

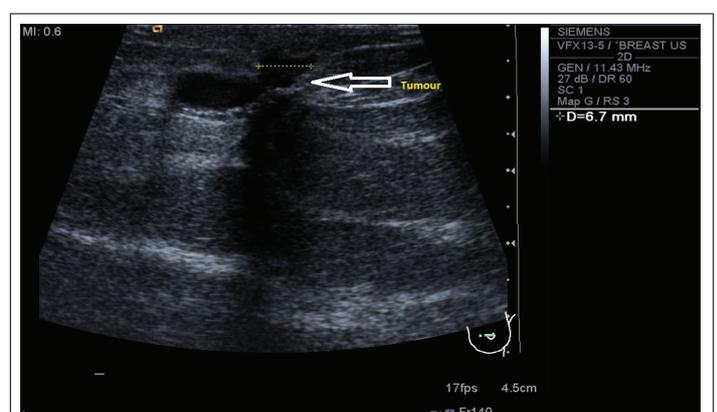
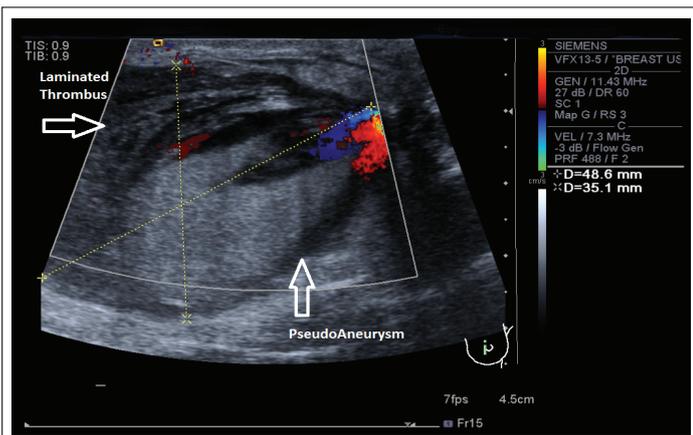
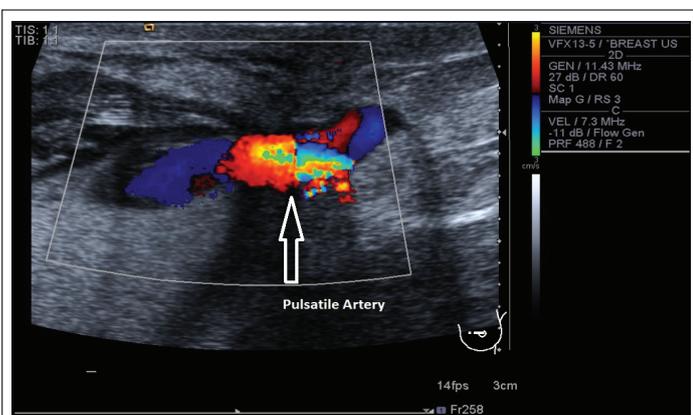


Figure 1: Ultrasound scan demonstrating 7 mm superficial tumour



**Figure 2:** Ultrasound appearances of 4.8 × 3.5 pseudoaneurysm with laminated thrombus adjacent to tumour



**Figure 3:** Ultrasound identification of artery supplying pseudoaneurysm

## Discussion

Breast pseudoaneurysms are quite rare with only 19 reported cases in the literature [1]. The majority of the cases were after core biopsies for the investigation of breast disease [2,3] but it has also been reported to occur after vacuum assisted procedures [4], lumpectomy [5] and fine needle aspiration cytology procedures [6]. Despite its rarity, the management is frequently radiological with percutaneous injection of ethanol [6,7] and coiling being feasible options [8].

Our patient developed bleeding immediately after core biopsy. The most likely mechanism is inadvertent puncture of a superficial artery. In most cases, compression should lead to clot formation, limiting bleeding and preventing the development of a haematoma. However, it is possible that the anticoagulant effect of warfarin, combined with puncture of an artery, predisposed our patient to a pseudoaneurysm. Additionally, the presence of pulmonary arterial hypertension could reflect systemic hypertension and added an additional predisposing factor to pseudoaneurysm formation.

Interestingly, the patient did not complain of any additional pain or sensation of a pulsatile mass in her breast. Furthermore, on clinical exam, the haematoma was not pulsatile and the differential of a pseudoaneurysm was not entertained. Fortunately, the availability of radiological services enabled us to determine the nature of the breast swelling and thereby allowed appropriate planning of the operation minimising potential significant blood loss. It is therefore reasonable, that patients with a non-resolving haematoma should have an ultrasound scan prior to surgery to exclude a pseudoaneurysm especially if they were at high risk (on anticoagulation, hypertension).

Doppler ultrasound is useful in the evaluation of breast pseudoaneurysms and typically displays a swirling flow in the mass [7] aiding to differentiate from a haematoma. Traditionally, these pseudoaneurysms were treated surgically, however newer techniques have evolved such as coiling [8] or percutaneous treatment with alcohol [7]. Compression techniques are often unsuccessful as the neck of the aneurysm may be too wide following puncture with a 14G needle [7]. Our patient was treated surgically, as she required synchronous resection of a malignant tumour. Additionally the feeding vessel was quite small and easily accessible to the operating surgeon.

## Conclusion

In conclusion, pseudoaneurysms of the breast are rare but can detect following core needle biopsies and should be suspected in patients with post-procedure haematoma on anticoagulation and hypertension. Doppler ultrasound has a high sensitivity for pseudoaneurysms and is a useful adjunct in diagnosing these lesions. Treatment options could be surgical if there is a need for synchronous resection of malignant lesions; however, radiological intervention is a feasible alternative.

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