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Case Report

The Post-Operative Mammographic Appearance of Lymphovenous Bypass and Vascularized Lymph Node Transfer[☆]

Emily S. Nia, MD^{a,*}, Miral M. Patel, MD^a, Edward I. Chang, MD^b, Ravinder S. Legha, MD^a, Megha M. Kapoor, MD^a

^a Department of Breast Imaging, M.D. Anderson Cancer Center, Houston, TX, USA

^b Department of Plastic Surgery, M.D. Anderson Cancer Center, Houston, TX, USA

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ABSTRACT

The postoperative mammographic imaging appearance related to lymphovenous bypass and vascularized lymph node transfer has not been described. It is important for breast imagers to become familiar with the expected appearance of surgical changes that can be seen in the follow up imaging of breast cancer survivors in order to create accurate reports and adjust imaging protocols to improve imaging quality and lessen patient discomfort as needed.

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Case report

A 66-year-old white female presented to our breast imaging clinic for her annual diagnostic mammogram surveillance. Her past medical history was notable for a diagnosis of right breast cancer treated with breast conservation therapy and axillary nodal dissection. After completing radiation therapy, she began to have lymphedema and swelling of the right arm. She is right hand dominant. Her lymphedema was initially treated with massage, compression sleeves, and manual lymph-

phatic drainage. However, the patient had little response to conservative treatments of her lymphedema and continued to experience significant arm swelling complicated by multiple episodes of cellulitis, one of which required hospitalization for intravenous antibiotics therapy. Diagnostic mammogram revealed a stable surgical scar in the upper outer quadrant of the right breast and a new linear density/metallic wire in the right axilla (Fig. 1). After speaking to her treatment team, it was found that the patient had recently undergone a lymphovenous bypass and vascularized lymph node transfer surgery to treat her persistent right-sided lymphedema. The new metallic object in her axilla represented the remnant wire from

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* Corresponding author.

E-mail address: esniamd@mdanderson.org (E.S. Nia).

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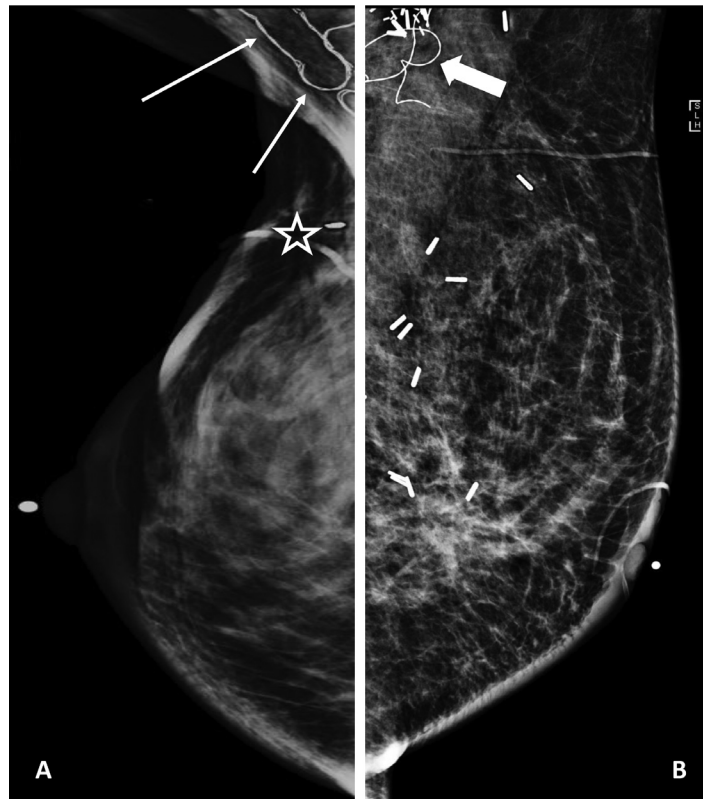


Fig. 1 – A. Right mediolateraloblique (MLO) view mammogram demonstrates a surgical scar with associated surgical clip in the upper outer right breast (white star) and linear density/metallic wire in the right axilla (white arrows) in a patient with a history of breast conservation therapy, lymphovenous bypass, and vascularized lymph node transfer surgery. **B.** Left MLO mammogram demonstrates a similar linear density/metallic wire in the left axilla (white thick arrow) in a different patient with a similar past medical and surgical history. The linear density/metallic wire in both cases represent the remnant wire from the implantable doppler probe utilized to monitor the newly transferred lymph node postoperatively.

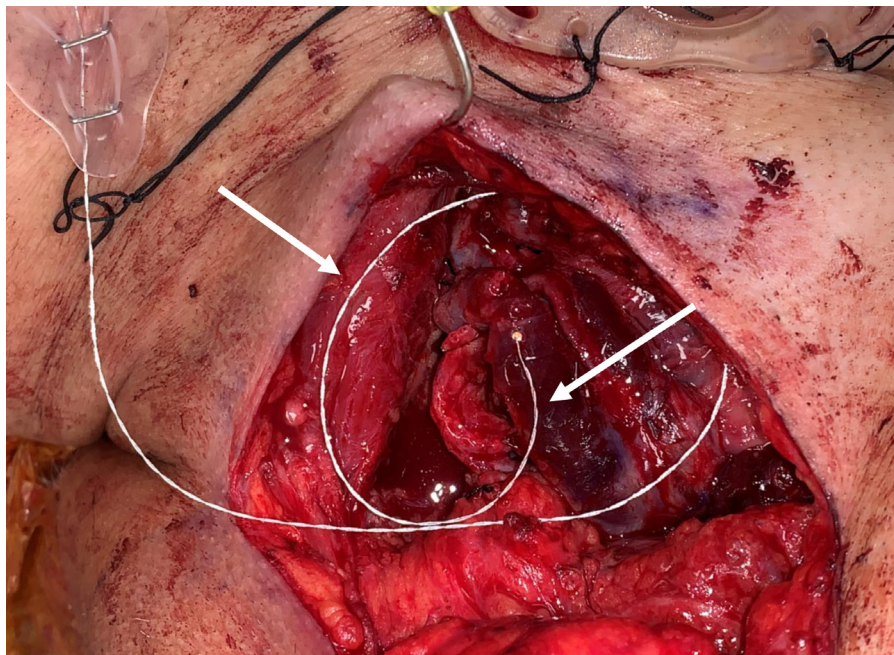


Fig. 2 – Representative intra-operative image demonstrating the implantable Doppler probe (arrows).

the implantable doppler probe utilized to monitor the newly transferred lymph node postoperatively (Fig. 2).

Discussion

Lymphedema is one of the most common and debilitating complications of breast cancer survivors secondary to axillary lymph node dissection as part of the surgical treatment [1–3]. Lymphedema arises from the interstitial accumulation of protein-rich fluid that would normally drain via the lymphatic system back to the venous circulation. Chronic swelling leads to soft-tissue fibrosis and adipose tissue hypertrophy, and it increases patients risk for cellulitis that can further damage the lymphatic capillaries [4]. Upper limb swelling, pain, heaviness, tightness, decreased range of motion and restriction ensues resulting in emotional distress and significant impact on the quality of life of breast cancer survivors [1].

No definitive treatment currently exists for lymphedema. Nonsurgical treatment options for lymphedema include manual lymphatic drainage, bandaging with short stretch bandages, the use of compression sleeves, skin care, and remedial exercises [4]. Given recent advances in microsurgical techniques, procedures such as lymphovenous bypass and vascularized lymph node transfer have gained popularity in the treatment of lymphedema. Lymphovenous bypass is a technique in which surgeons use a super microsurgical technique to anastomose subdermal lymphatic vessels and adjacent venules less than 0.8 mm in diameter creating new drainage channels. These new channels drain excess fluid trapped in lymphedematous areas into the venous circulation to increase the region's capacity to transport fluid [5–7]. Vascularized lymph node transfer involves the microvascular transplantation of functional lymph nodes into an extremity to restore physiological lymphatic function. It is most commonly performed by transferring combined deep inferior epigastric artery perforator and superficial inguinal lymph node flaps [8]. Historically, these 2 procedures were performed separately; however, recently these two techniques have been performed together as one procedure to increase efficacy in the treatment of lymphedema. Studies show lymphovenous bypass and vascularized lymph node transfer as an effective technique in the treatment of lymphedema in breast cancer survivors [5,8].

In an era of increasing utilization of surgical treatments for lymphedema, it is important for radiologists to stay up to date with the imaging appearance of the post-operative axilla. On mammogram, the wire from the vascularized lymph node transfer monitor is seen as a linear metallic density foreign body along the axilla. It is important not to mistake these wires for other similar appearing foreign bodies such as wires related to placement of central vascular lines.

The presence of foreign bodies can impact mammograms

by decreasing image quality and increasing radiation [9–11]. By becoming familiar with the postoperative imaging appearance of treatments experienced by breast cancer survivors such as lymphovenous bypass and vascularized lymph node transfer, imaging protocols can potentially be adjusted to improve image quality, decrease radiation dose, and improve patient positioning.

Patient Consent

Written informed consent for publication of their case was obtained from our patient.

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