

**FDG avid internal mammary lymphadenopathy and implant rupture in PET/CT  
unveiling clinically unsuspected silicone granuloma in treated breast cancer**

**Short running title: FDG avid lymph node: benign/ malignant**

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**Abstract:**

Fluorine-18 fluorodeoxyglucose (F-18 FDG) uptake in enlarged lymph nodes is always suspicious, especially in cancer patients. We report a case of hypermetabolic internal mammary lymphadenopathy in a breast cancer patient who was previously treated with bilateral mastectomy and implants. The abnormal nodal uptake turned out to be due to foreign body induced inflammation, confirmed on histopathology. Vigilant PET interpretation is required in breast cancer patients with evidence of breast implant rupture.

**Keywords**

Silicone breast implant; implant rupture; lymphadenopathy; FDG PET/CT; breast cancer

## **Introduction**

Breast cancer patients are often followed up with F-18 FDG PET/ CT to detect local recurrence and metastasis. Any focus of abnormally increased radiotracer uptake should not be overlooked, as the activity could be due to malignancy or other benign conditions which cause high cellular metabolism. Silicone induced lymphadenopathy is an uncommon late complication following breast implant surgery.

## **Case report**

A 54-year-old female presented to our hospital with bilateral chest wall pain deep to her breast implants. She had undergone bilateral mastectomy with reconstruction 14 years back. Right mastectomy was done as definitive treatment for ductal carcinoma in-situ and the left mastectomy was prophylactic. She was referred for whole body PET/CT scan to rule out tumor recurrence and help with a more conclusive diagnosis. PET scan showed nonspecific multifocal moderate hypermetabolic activity around the breast implants, more prominent on left (Fig. 1A, 1B), possibly inflammatory changes. A wavelike contour of bilateral breast implants (Fig. 1C) suggested implant rupture. Moderate hypermetabolic activity was noted (Fig. 1A, 1B) in enlarged right internal mammary lymph nodes (Fig. 1C). No abnormal findings were noted elsewhere. Breast magnetic resonance imaging (MRI) confirmed bilateral breast implant rupture and right internal mammary lymphadenopathy (not shown). The suspicious node was excised. Histopathology showed lymph node with foreign body giant cell response.

## **Discussion**

Breast implant rupture is categorized as intracapsular and extracapsular. Intracapsular rupture is often unnoticed clinically as the free silicone is kept in place by a surrounding fibrous capsule. Extracapsular rupture is often associated with silicone migration [1]. Leaked silicone can either remain within the breast, or migrate to axillary and sometimes internal mammary nodes and even distal nodal and extra nodal sites [2]. Differential diagnosis on PET includes cancer recurrence, de novo malignancy, metastasis and silicone granuloma.

Physical examination is less sensitive to detect silicone breast implant rupture especially when there is no capsular contracture. Dedicated breast MRI is the imaging modality to detect and evaluate clinically unnoticed rupture [3]. Unfortunately, some women cannot undergo MRI because of contraindications like having cardiac pacemakers, other devices or claustrophobia. PET imaging can show increased FDG uptake in the regions of silicone induced inflammation [4]. Histopathological examination is crucial for a definitive diagnosis [5]. Ruptured implant removal should be considered to prevent further complications from silicone-gel migration.

## **Conclusion**

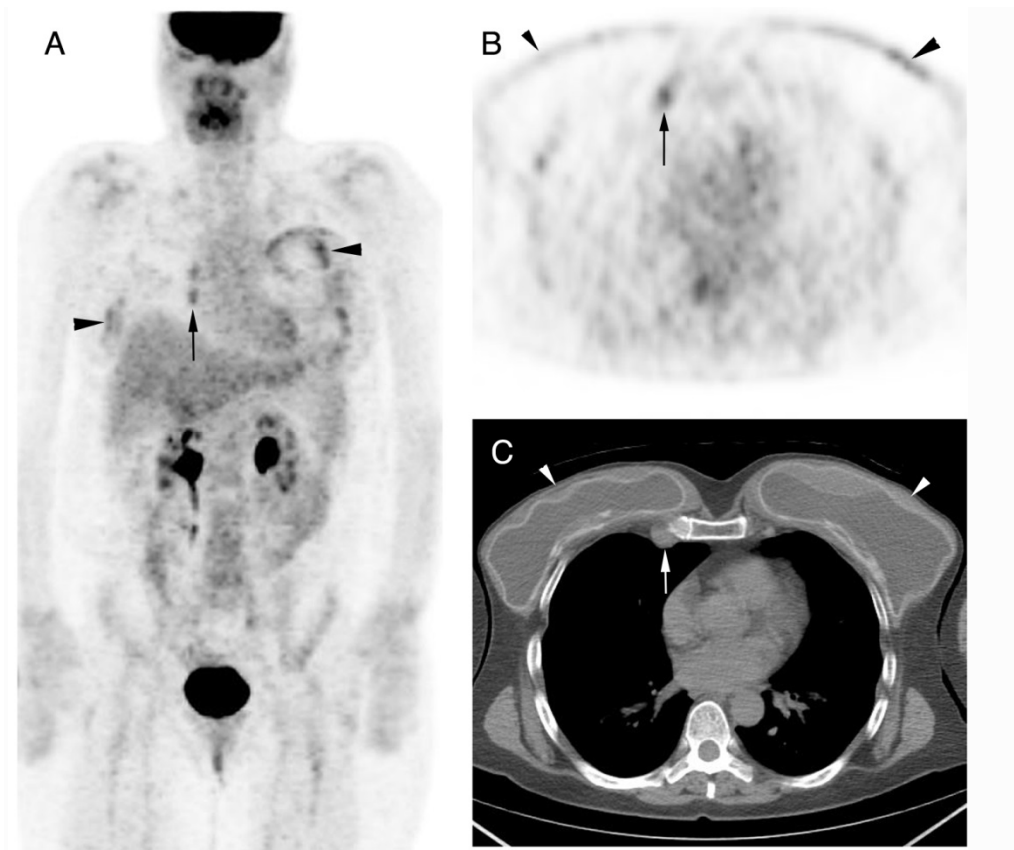
FDG uptake in nodal or even extra-nodal sites is non-specific in patients with history of breast cancer and breast implant rupture. Any uptake should be interpreted with caution as this could be malignant or benign from granulomatous inflammation. Once the foci of increased FDG uptake are determined, correlation with histopathology is decisive before further treatment.

## Disclosure

The authors declare that they have no conflicts of interest.

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**FIGURE 1****Figure Legends**

**FIGURES 1A and 1B:** Maximum intensity projection (MIP) (A) and axial FDG PET (B) images show patchy activity around breast implants, left more than right (arrowheads) and hypermetabolic right internal mammary nodes (vertical arrows).

**FIGURE 1C:** Axial unenhanced CT thorax image at the level of breasts show wavy contour of bilateral breast implants (arrowheads) suggesting rupture, and enlarged right internal mammary node (vertical arrow).