Magnetic Resonance Imaging for Axillary Staging in Breast Cancer Patients Receiving Neoadjuvant Chemotherapy: Comparison with Ultrasonography and Positron Emission Tomography

S. Kim[1], C. Lyou[1], and M. Jang[1]

[1]Seoul National University Bundang Hospital, Seongnam-Si, Gyunggido, Korea, Republic of

Background and purpose: The presence of axillary lymph node (LN) metastases in breast cancer is an important factor in assessing prognosis and determines management. Although surgical biopsy remains the gold standard for the diagnosis of axillary LN metastasis but standard for surgical biopsy in monitoring for chemotherapy response does not established yet. Comprehensive and sequential staging of axilla using noninvasive diagnostic modalities has been approached and which would represent an importance advance in the management of breast cancer patients. In complete remission group, sentinel LN biopsy have been tried to replace axillary lymph node dissection (ALND). The purpose of this study to evaluate the accuracy of comprehensive pre- and post-neoadjuvant chemotheraphy(CTX) axillary staging via MRI, ultrasound imaging (US) and positron emission tomography (PET).

Material and Methods: From November 2006 to February 2008, 151 neoadjuvant CTX patients at our hospital underwent axillary staging by MRI, US, PET or a combination of those. Among those, we include 84cases which did all follow-up image studies e.g. MRI, US, and PET at pre- and post-CTX. We compared each modality at pre- and post-neoadjuvant CTX in monitoring axillary staging according to FNAB results and ALND, respectively.

Results: At pre-CTX, 74 patients have positive finding of suspicious axillary metastasis on MRI, 73 patients on US, 68 patients on PET. 70 patients with suspicious finding on US underwent US guided FNAB. In 62 cases, axillary metastases were confirmed by FNAB.

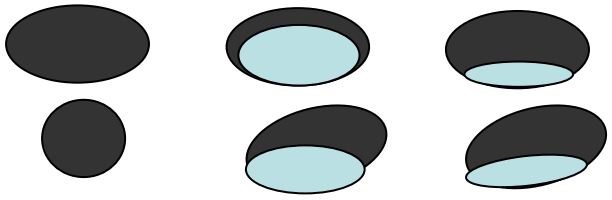
On post-CTX imaging all metastatic LNs except one case showed decreased in size and numbers. In 52 cases, LN metastases were confirmed by ALND. Positive findings were remained in 18, 18 and 18 patients on MRI, US and PET, respectively. The sensitivity and specificity of MRI, US and PET at post-CTX are 30.8%/ 93.8%, 23.1%/81.3% and 34.6%/100%, respectively comparing with surgical axillary LN biopsy. And positive predictive value (PPV) and negative predictive value (NPV) MRI, US and PET at post-CTX are 88.9%/ 45.5%, 66.7%/39.4% and 100% / 48.5%, respectively.

Conclusion: Our experience suggests that MRI, US and PET monitoring neoadjuvant CTX is useful in axillary staging. MRI and PET show high specificity and positive predictive value, it can be offer useful information to select sentinel LN biopsy candidates after CTX.

◆ Sensitivity, Specificity, PPV, NPV and Accuracy of Post Neoadjuvent MRI, US and PET

	MRI	US	PET
Sensitivity (%)	30.8	23.1	34.6
Specificity (%)	93.8	81.3	100
PPV	88.9	66.7	100
NPV	45.5	39.4	48.5
Accuracy	54.8	45.2	59.5

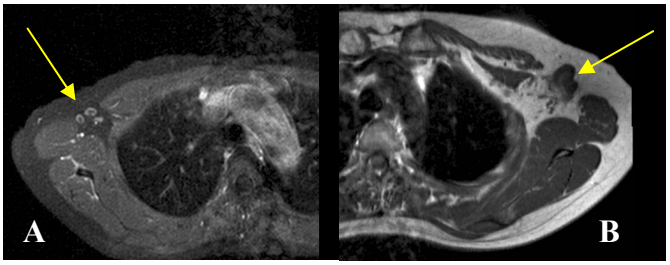
◆ Morphologic Criteria for Suspicious Metastatic LN



Round or oval mass with loss of fatty hilum

Even or uneven cortical thickening over 3mm with preserved hilum

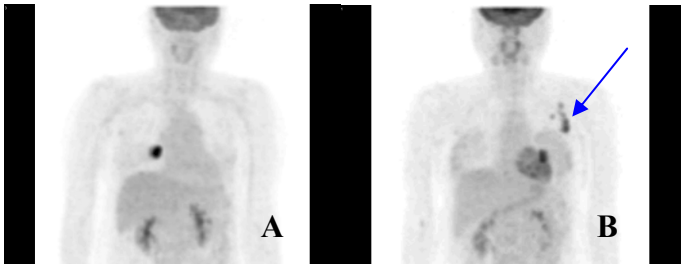
Even or uneven cortical thickening over 3mm with compressed hilum



MRI example of normal LNs(A) and metastatic LNs(B)

A: oval shape LNs and preserved fatty hilum (arrow)

B: Cortical thickened LN with compressed fatty hilum(arrow)



PET example of normal LNs(A) and metastatic LNs(B)

Metastatic LNs with hot FDG uptake (max SUV-4.7, arrow, B)