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Mobile gamma camera imaging in sentinel lymph node biopsy of melanoma patients

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Background: Lymph node metastasis is a strong predictor of melanoma-associated mortality. However, the false negative rate for sentinel lymph node biopsy (SLNBx) has been reported as high as 24%. Intra-operative mobile gamma camera (MGC) imaging may improve the accuracy of SLNBx. Methods: From 4/08-9/08, 20 patients undergoing SLNBx for melanoma were imaged with MGC. Participants underwent standard lymphoscintigraphy followed by intra-operative MGC imaging. Hot spots detected by fixed gamma camera (FGC), MGC and hand-held gamma probe were recorded. Intra-operative logistical challenges were scored. Situations in which MGC was useful in adjunct to standard practice were recorded. Results: Among 20 participants, 30 lymph node basins containing SLNs were identified with a total of 46 SLNs. The sensitivities for detection of basins were 97% (29/30) for the FGC and 90% (20/30) for the MGC. 70% of the SLNs (32/46) were detected as individual hot spots by the FGC compared to 93% (43/46) for intraoperative MGC imaging. Among the 12 subjects who receiving 99mTc-SC injection on the day of surgery (as opposed to the previous day) the basin and SLN detection sensitivities for the MGC were both 100%. Investigator opinion of MGC (scale of 1-9; 1=outstanding, 9=inability to complete study) resulted in a mean score of 2.3 for MGC identification of hot spots preoperatively and 2.0 for identification of residual nodes. Conclusions: Real-time, intra-operative imaging in SLNBx for melanoma is sensitive and provides additional information when FGC imaging fails or is ambiguous. Use of the MGC warrants further investigation for its potential to reduce false negative SLNBx.

Author: Dr WILLIAMS, Mark B (Department of Radiology, Department of Biomedical Engineering, Department of Physics University of Virginia)

Co-authors: Dr SLINGLUFF, Craig (Department of Surgery, University of Virginia); Dr DENGEL, Lynn (Department of Surgery, University of Virginia); MORE, Mitali (Department of Biomedical Engineering); JUDY, Patricia (Department of Biomedical Engineering); Dr MAJEWSKI, Stan (Department of Radiology, University of West Virginia)

Presenter: Dr WILLIAMS, Mark B (Department of Radiology, Department of Biomedical Engineering, Department of Physics University of Virginia)

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