

Parasternal biopsy using Micromate™

Marco van Strijen, MD
Interventional Radiologist, St. Antonius Ziekenhuis, Nieuwegein, The Netherlands



Patient description

54-year-old female

Diagnosed with breast carcinoma in 2017. Treated with chemotherapy. In remission.

Paracardial and parasternal lesions found in follow-up PET-CT scan.

Key Takeaway

Micromate™ helps standardize the workflow for percutaneous soft-tissue biopsies. Its stable instrument guidance enables to coaxially advance biopsy devices through a guidance needle, preventing harmful angular deviations during insertion caused by surrounding tissue or breathing.

Case Rating

When compared to state-of-the-art freehand targeting | doi: 10.2214/AJR.09.3647. PMID: 20410392.



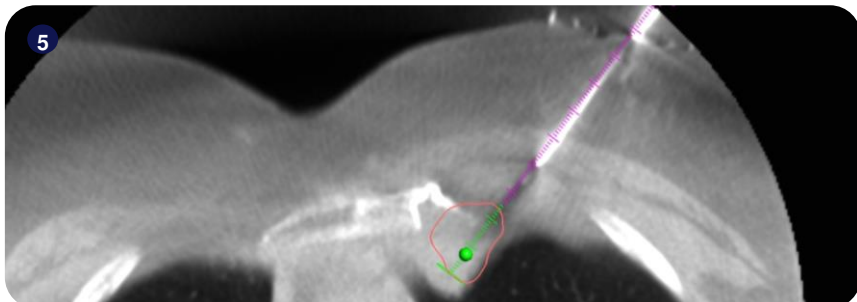
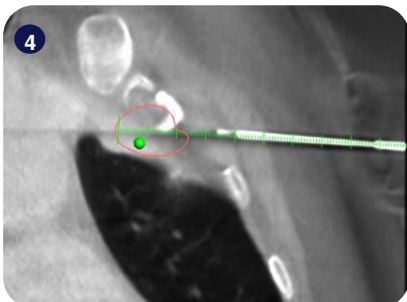
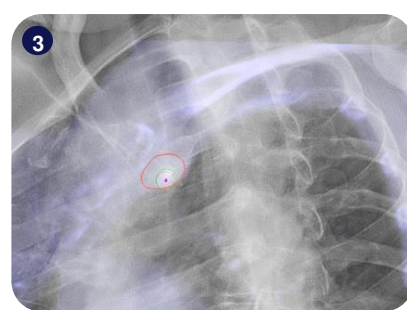
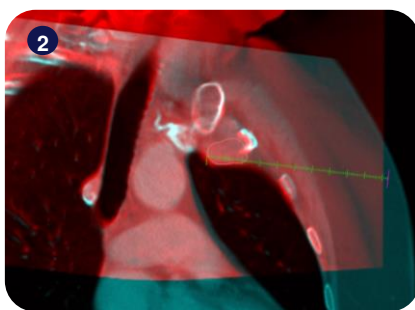
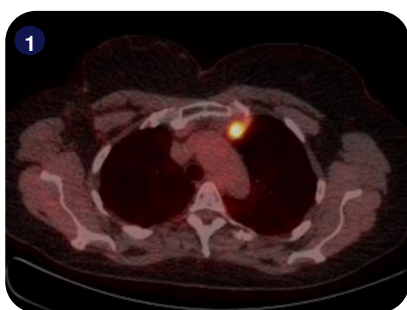
Radiation exposure (mSv)
6.57 mSv
48% less radiation



Procedure duration
19 min
33% faster

An intra-operative 3D scan of the patient in supine position was performed using a Philips Allura Xper FD20 angiography device, and fused with diagnostic PET-CT. The suspicious lesion was segmented, and the surgical trajectory planned using the Xper Guide planning software. A target point for the insertion of the biopsy needle was defined at the distal border of the segmented lesion, to ensure tissue harvesting covered the whole lesion. Micromate™ was then gross-positioned near the predefined entry-point and remotely controlled for alignment to the surgical plan under fluoroscopic live imaging.

After the robotic alignment, an 17G tru-cut biopsy needle was coaxially inserted twice through a 17G guiding needle for tissue harvesting. A (breast) metastatic adenocarcinoma was diagnosed. The procedure lasted 19 minutes. Post-operative accuracy measurements indicated a guidance needle accuracy of 0.00mm (i.e., placement of the needle within the 2 cm cut window) and an angular displacement of 1.41 degrees along the trajectory in the Progress View. Post-operative 3D CBCT scan showed no pneumothorax. A follow-up conventional chest X-ray was taken 4 hours after the procedure. Pneumothorax signs have been found, requiring the insertion of a small chest drain. The coaxial guidance needle was accurately placed. The complication is likely due to a more distal, deliberated, physician-determined insertion of the tru-cut biopsy needle than planned.



1) Pre-operative PET-CT scan view. The paracardial and parasternal lesion is clearly visible; 2) Definition of the surgical plan in the fused PET-CT and intra-operative CBCT scan. The red contour shows the borders of the segmented lesion; 3) Scout scan in the Entry Point View prior to the gross-positioning of Micromate™; 4-5) Intermediate scans of the guidance needle advancement to the vicinity of the lesion, prior to tissue harvesting.