

MRI-guided mediastinal biopsies: retrospective evaluation on 15 cases

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Purpose

To determine whether MRI allows safe and accurate real-time guidance for biopsies of mediastinal masses.

Material and methods

We retrospectively collected the procedural and histopathological data from all mediastinal biopsies performed under MRI guidance between February 2010 and January 2014. Regarding procedural data, we reviewed the size and location of the lesions, the position of the patient for the biopsy and the duration of the procedure (from the planning MR-scan to the last post-biopsy control). We also evaluated the time necessary to position the biopsy needle (from local anesthesia to the first biopsy). Regarding histological data, we collected the results of all percutaneous biopsies and also those of surgical specimen when the patient underwent surgery in a second step.

Results

There were 15 patients (7women/8men) included in this retrospective study. Mean age was 74 years old (18-82). Lesions were located in the anterior mediastinum (n=13) and middle mediastinum (n=2). Mean size of the greatest axial diameter of the lesions was 7,1 cm (3,6-11). Biopsies were performed in supine position in 13 cases and in prone position in 2 cases. Total duration of procedure was 42 minutes on average (27-62), with a mean time to position the needle biopsy of 9,4 minutes (3-18). Histological analysis revealed malignancy in 12 cases, with 4 of this 12 lesions being confirmed at surgery. These 12 biopsies were all considered as true positive biopsies. One biopsy was considered as true negative as histology revealed granulomatous inflammation consistent with a sarcoidosis, without any modification of the size of the lesion at 1-year follow-up. One biopsy was considered as false negative as percutaneous biopsy concluded to mesothelial hyperplasia, whereas surgery revealed malignancy. Finally, one biopsy was not diagnostic as there was no clear histological result possible. The lesion turned out to be a thymic hyperplasia on a secondary CT-guided percutaneous biopsy. Given these results, sensitivity, specificity, positive predictive value, negative predictive value and accuracy of MRI-guided biopsies in our study were respectively 92,3%, 100%, 100%, 50% and 86,6%. There was no immediate complication.

Fig.1: biopsy of a mediastinal mass using two orthogonal views. The real-time sequence show good positioning of the needle's tip inside the tumor

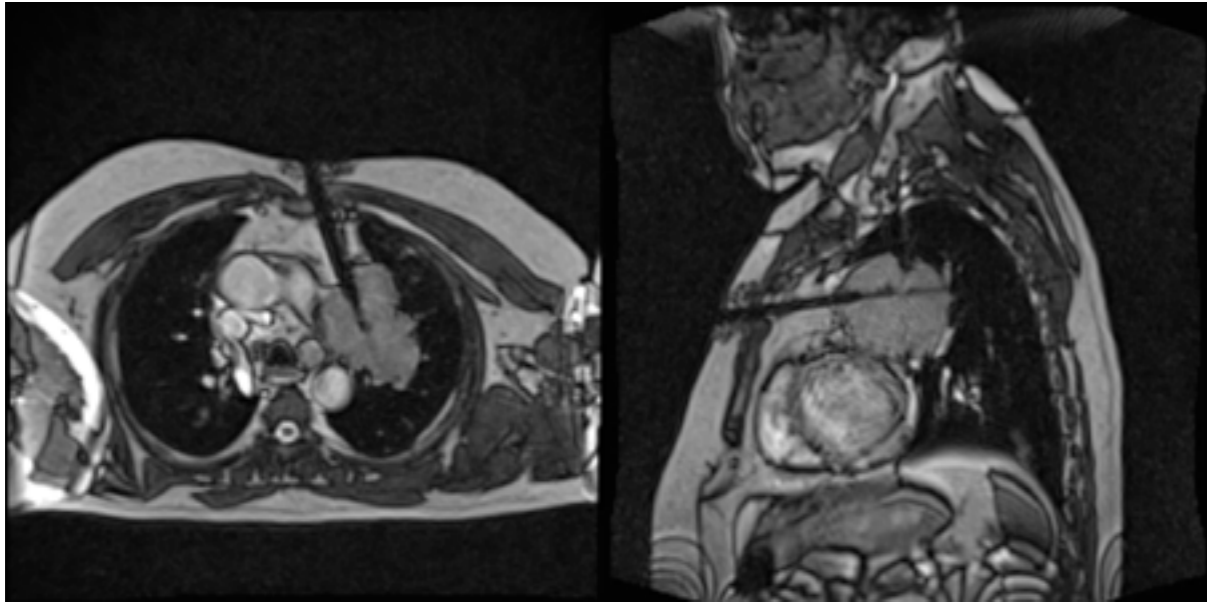


Fig.2: biopsy of a mediastinal mass using a posterior approach. MRI clearly shows the mass, the lung and the great vessels.

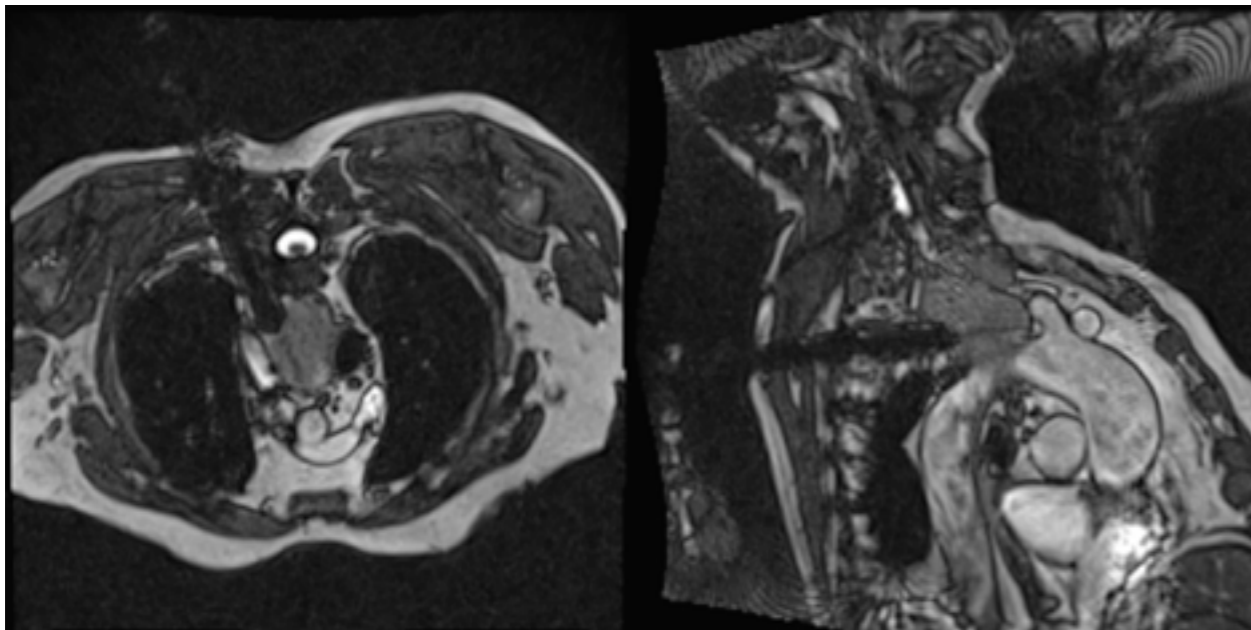


Fig.3: biopsy of a mediastinal mass using an anterior approach. The good contrast resolution of MRI allows to avoid targeting the necrotic parts of the tumor.

