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Title: Usefulness of magnetic resonance imaging with optimized conventional and non-conventional sequences in the assessment of solitary pulmonary nodules and large size lesions: Preliminary experience

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Body: Despite the current availability of diagnostic procedures, the diagnosis of solitary pulmonary nodules still remains challenging. The aim of this clinical study is to evaluate the lung magnetic resonance imaging (MRI) with focused conventional sequences and diffusion weighted imaging. Methods: we assessed 55 subjects with pulmonary lesions under blinded conditions using a MRI scanner. The exam was carried out with diffusion-weighted sequences (B500 and B1000 DWIBS) and ADC map with a qualitative and quantitative study. Results: Out of 5 mm nodules (n=23) studied with DWIBS, 16 did not show abnormalities and were unchanged in 1 year follow-up and 3 were not identified compared with CT. DWIBS was positive in 2 cases, false-positive in 1 case and false-negative in 1 case. In 32 lesions >10 mm, histologically confirmed, DWIBS helped the biopsy planning, the definition of neoplastic tissue within atelectatic lung parenchyma, the differentiation of parietal pleura from pleural effusion and the characterization of mediastinal lymph nodes. Conclusion: The study on large size lesions and nodules showed a considerable statistical significance (p<0.001; diagnostic accuracy 86.5%). The technique, despite the limitations of a preliminary study, may increase nodules detection and, with CT or PET, provide additional useful information.