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# The role of the radiographer in performing breast biopsy guided by magnetic resonace: an analysis of the procedure and technical aspects

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#### PURPOSE

The purpose of the study was to describe an innovative procedure developed in the diagnostic field aimed at the examination of breast and breast diseases: breast biopsy performed under the guidance of magnetic resonance imaging. The study analyses some practical aspects of fundamental importance for the success of the procedure such as the type of sequences usually performed, the preparation of the room and of the patient, the different professional figures involved and the actions performed by Radiologist and Radiology Technicians.

#### **METHODS**

The target group consisted of three patients, a breast biopsy performed under the guidance of magnetic resonance in the Oulu University Hospital, during the April 2019. The execution of breast MRI-guided procedures is justified by the need to characterize suspicious lesions identified by MRI, but not distinguishable by other imaging techniques such as mammography, tomosynthesis and ultrasound. The data collected during the practical training was then analyzed and integrated with descriptive data from the literature, from articles and publication about the breast biopsy guided by MRI. The nature of study was experimental.

#### **KEY RESULTS**

Among the imaging techniques currently available in the senological field, magnetic resonance imaging has the highest sensitivity ever: it is able to identify about 95% of invasive carcinomas, maintaining a high percentage, between 80-92%, even for ductal carcinomas in situ. In the clinical practice, the percentage of lesions detected for the first time by MRI and secondly by retrospective second look varies from 22% to 82%. The most commonly used technique for guided MRI sampling is Vacuum-Assisted Biopsy (VAB). This system is highly accurate for small ( $\leq 1$ cm) or poorly enhanced lesions, it minimizes positioning errors and it ensures a high probability of final collection (De Falco A. D. et al. 2016, Burtea et al. 2008). VAB guided MRI sampling is very accurate, but there is a relatively low percentage, about 8-12%, of cases where lesion sampling is inadequate, with related 1-2.5% of false negatives after biopsy (Perlet et al. 2016, Morris et al. 2008).

#### Significance of results for radiography

Both breast MRI and the bioptic MRI-guided procedures, prove to be a fundamental clinical tool and allow the breast team to designate an optimized and personalized treatment, based on the characteristics of the lesion and the real extent of the disease (De Falco A. D. et al. 2016.) The radiographers performs tasks of fundamental importance starting from the preparation of the room and the patient. Radiographer takes care of washing and disinfecting all the instruments used, of reorganize the dedicated instrumentation and of prepare the magnet room on the basis of the next MRI examination. During the execution phase of the procedure, at least two radiographers must always be present: the first will be responsible exclusively for the acquisition of the MRI sequences, while the second one will provide support to the radiologist, to the patient and will manage the MRI Atec facility (Parker & Burbank 1996). The Physician and radiographers who perform the MRI-guided procedures must be familiar with the VAB procedure under radio-stereotactic guidance. It is also useful to underline that, in order to perform an optimal procedure, the collaboration between the radiographer and the radiologist is fundamental: each of these two professionals, in fact, carries out specific and precise tasks, and could not complete the biopsy without the help of the other members of the team

The undisputed limit of the MRI guided biopsy, at least for what concerns the Italian work environment, is constituted by the small number of centers that perform the procedure. From the economic point of view, in fact, high costs and expenses, such as those necessary for the dedicated instrumentation, are not sustainable in relation to the relatively low percentage of procedures that would be performed. The most important development in the future italian working world could therefore concern precisely this aspect: the use of greater resources in order to obtain a more extensive increase in an innovative procedure, essential to ensure optimal treatment for all patients with suspected breast lesions.

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