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Mammography program at ELETTRA: clinical conclusions of the first study

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In the last decade the use of different Synchrotron Radiation (SR)-based techniques for breast imaging has been extensively explored. In this framework, at the SYRMEP beamline, a dedicated research program has started in the late '90s and reached the clinical phase in 2006.

The aim of the first protocol with patients was to evaluate the diagnostic contribution of phase contrast mammography with SR in patients with questionable or suspicious breast abnormalities identified at combined conventional mammography and ultrasonography.

Patients accessing the University Hospital of Trieste for their mammography exams were recruited by radiologists according to the research program approved by the local Ethic Committee. 71 patients were studied in this first protocol.

Compared with conventional mammography, examinations with SR showed mainly a higher specificity, reducing in particular the number of false positives [1]. The diagnoses performed using the SR images have a higher agreement with the final diagnoses based on the golden standard, i.e. the biopsy, compared with those achieved from the conventional exams held at the hospital.

A qualitative comparison between the SR and conventional images was performed applying a relative scoring procedure. The outcome was that mammography with SR represented with higher quality both the normal anatomic breast structures, including fat and glands, and the abnormal findings, including masses and calcifications [1].

In the talk the main clinical considerations about the first experience with patients and the discussion of some key cases are presented.

The detector used in this study was a conventional mammographic film-screen system: the choice was motivated by its high intrinsic spatial resolution. A new clinical trial using a commercial digital system provided by Fuji has started this year and is still running.

1. Castelli et al. (2011), Radiology, Vol.259, p.684-694.