

The Method of Digital Low-Dose Microfocus Mammography

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Abstract

A method of obtaining high informative X-ray images with high geometric enlargement of the object is described in this work. Presently this method is not used for mammary gland diagnostic. Unlike the common methods of X-ray mammography in which the X-ray tube focal spot is about 100–300 μm and the coefficient of object enlargement is not more than two times. In the proposed method the X-ray tube with focal spot of about 25–50 μm is used that allows obtaining sharp X-ray images of mammary gland with coefficient of object enlargement of 3 to 10 times. Comparative researches using specialized mammography phantom allows to evaluate benefits of microfocus method compared with traditional methods. Images with 5-times object enlargement obtained using microfocus X-ray tubes have much higher information content and contain images of smaller and less contrastive structures than images obtained by traditional mammography. It may be significant for the correct and timely assessment of the pathologic process. It is shown that the exposure with multiply object enlargement allows using X-ray detectors with lower spatial resolution. It allows reducing the exposure dose by increasing the size of a digital detector's pixel.

Key words: Mammography, Microfocus X-ray Diagnostic, Direct Enlargement of X-ray Image.

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