Early Detection of Breast Cancer is an Important Byproduct of Computed Tomography of the Chest

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Dear Editor,

Early detection reduces breast cancer related mortality and morbidity (1). But screening with mammography has several shortcomings: cancer detection in dense breast tissue is limited and there is the problem of overdiagnosis and overtreatment. It also has to be noticed that a substantial portion of invited women are not participating in organized screening programs. On the other hand, a large number of women are undergoing computed tomography of the chest (CT) for various indications (for example for the work-up of suspected lung cancer, complicated cases of pneumonia or pulmonary embolism) and in these CT scans the breasts are included without being systematically reported.

The detection of breast lesion in unenhanced CT scans (i.e. without the application of contrast media) depends on the density of the breast parenchyma, which is known from mammography. But most CT scans of the chest are performed using iodinated contrast media (for the opacification of the vessels) and as malignant breast tumors show a strong contrast uptake they can be distinguished from the normal breast parenchyma (2). In a study on 149 women, contrast-enhanced chest CT detected even more breast cancers than mammography or sonography (3). In contrast to mass lesions, microcalcifications, which are the hallmark of diagnosis of a ductal carcinoma in situ (DCIS), cannot be detected with conventional chest CT (2).

The number of CT scans is steadily increasing. According to the German National Agency for Radiation protection (Bundesamt für Strahlenschutz) around 1.75 million chest CT examinations have been performed in 2014 (4). In a study by Hansen and Jurik from Denmark around 33% of chest CT examinations are performed in women between 45 and 80 years and 19% in women between 45 and 64 years (5). According to this data around 332.500 chest CT examinations in women between 45 and 64 years ("screening age") have been performed in 2014 in Germany. For comparison, 2.86 million women participated in the German breast cancer screening program in 2014, equating to 54% of the invited women (6). I.e. 6.3% of women in the "screening age" undergo chest CT annually with the possibility for early breast cancer detection. There are several retrospective studies reporting about incidental breast findings on chest CT. Reported incidence ranges from 0.6% to 7.6% with a mean frequency of 3% (7-13). Of these incidental findings around 39.9% are malignant, with a reported between 17.3 and 69% (7-15). Given the assumption that 6.31% of women in the "screening age" receive computed tomography of the chest annually, a 3% chance of detection of an incidental breast finding and a rate of malignancy of 39.9% around 3980 incidental breast cancers in women between 45 and 64 could be detected annually in Germany with the help of chest CT scans.

In conclusion, the dedicated review of breast parenchyma in women undergoing CT of the chest may detect a substantial number of breast cancers, in fact about 1.2% of women undergoing chest CT will show an incidental detected breast cancer. Given the clinical importance of an early diagnosis of breast cancer the chance of detecting incidental breast cancers on chest CT should be taken. This is especially important in countries without established breast cancer screening programs. It has to be emphasized that CT should not be used as a primary screening modality of breast cancer, but if performed for other reasons, a systematic review of the breast is mandatory.

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