

## Case Report

# Ultrasound is a Superior Imaging Modality to Detect Early-Stages of Breast Cancer rather than a Supplement to Mammography

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## Abstract

Six cases are presented to demonstrate the superiority of ultrasound over mammography to detect early-stage breast cancer. In three of the cases the woman attended her gynecologist for a routine check-up including a clinical breast examination with ultrasound. Small suspicious tumors were found in sizes 4, 6, and 11 mm. Ultrasound findings were rejected by negative clinical examination, mammography, and supplementary shallow ultrasound at the regional breast cancer department. The radiologists reassured the patients that nothing abnormal was present. No control was advised. One patient was advised to cancel her follow-up appointment with ultrasound. Tumors grow to sizes of 17 to 20 mm over the next 16 to 19 month when tumors became clinically apparent. In one case a scare recurrence of 4 mm after lumpectomy was seen by ultrasound and referred; as the patient controls by clinical examination and mammography were normal no action was taken on the referral to the regional breast cancer center and the recurrence was allowed to grow until it was clinically apparent 12 month later. One case illustrates the depressing power of mammography to reject a breast cancer of 40 mm. The presented cases illustrate serious consequences for patients when mammography is trusted on behalf of meticulously performed ultrasound. Even when tumors were found and described by ultrasound the regional department appointed by the health authorities chose to neglect ultrasound results. Consequences were much delayed treatment. In the official guidelines it is repeatedly stated that mammography is first choice and ultrasound is a good supplement for detecting early-stages of breast cancer. The data, however, suggest that ultrasound is a more sensitive modality and should be preferred as first choice to detect early-stage breast cancer. A suspicion for breast cancer raised by ultrasound should never be neglected; biopsy as recommended in Triple Test and follow-up should be advised. A better training in ultrasound of medical personal dealing with breast cancer is called for.

**Keywords:** Mammography; Breast; Ultrasound

## Case Presentation

Ultrasound is postulated to be a good supplement to mammography to detect breast cancer [1-5]. The following case descriptions illustrate serious consequences and delay in treatment when ultrasound findings are devalued and mammography with cursory supplement ultrasound is trusted to reject suspicion of breast cancer raised by meticulously performed ultrasound.

Regional breast cancer departments are responsible for all breast cancer treatment in Denmark. They follow the guidelines drawn up by the Danish Health Authority, who on the subject is advised by DBCG, The Danish Breast Cancer Cooperative Group. All other doctors are not allowed to treat breast cancer patients but have to admit patients with breast cancer or suspicion of breast cancer to the regional appointed departments. Ultrasound as a primary screening modality is dissuaded by DBCG [6].

Internationally mammography is also first choice, likely because it was the first imaging modality to disclose breast cancer.

Furthermore it is easy to perform and cheap. It is often overlooked that mammography is x-ray radiation. X-ray is very good for diagnoses on bone material and teeth as very small doses are required. When it comes to soft tissue higher doses are required and the exposition is not quite to be neglected. Ultrasound is highly used for fetal diagnoses and for soft tissues diagnoses in many areas, for which is considered harmless. It is of concern how the breast imaging has escaped this medical development. Ultrasound as first choice for detection of breast cancer has not been evaluated in randomized studies. It has been described in a prospective, controlled study by this author [7].

The following cases illustrate the superiority of ultrasound to detect early and late stages of breast cancer where mammography misled doctors to preclude breast cancer. Four of the cases are included in a previously published study [7].

## Case 1

A 71-years-old woman attended her gynecologist (the author as in the following cases) for a routine checkup including a clinical breast



examination with ultrasound. Ultrasound revealed an 11 mm tumor in her left breast. The tumor was non-palpable. She was admitted with suspicion of cancer to the regional breast cancer department where the radiologist in the regional breast cancer department performed mammography, physical examination, and shallow ultrasound. The radiologist was not able to reproduce the finding and diagnosed the breasts healthy, and did not advice follow-up. As the patient trusted the experts at the regional breast cancer department she did not come back to her gynecologist for control. Sixteen month later she could feel the tumor herself and was admitted to the regional breast cancer department by her general practitioner. She was operated for a 20 mm big ductal carcinoma.

### Case 2

A woman of 63 had felt her right breast to be lumpy for 4 years. She had attended mammography screening and she had also been examined at the regional breast cancer department including a biopsy of her breast. Probably performed free-hand without ultrasound. Mammography was negative. The biopsy was recorded in the central Danish Pathology Register where the author looked it up to see it was benign and collected 4 month earlier. It included both fine needle and Trucut biopsy. The gynecologist performed ultrasound and disclosed an ultrasonically well demarcated 40 mm tumor. As the regional system had failed the gynecologist took the biopsy herself disobeying the directive from the health authorities. The biopsy showed a lobular carcinoma. The patient was then admitted and was treated for breast cancer.

### Case 3

A 53-years-old woman had a lobular carcinoma of 11 mm in her left breast diagnosed by her gynecologist using ultrasound and biopsy. She was operated by lumpectomy at the regional breast center. Mammography was negative. She attended her gynecologist for follow up by ultrasound as a supplement for the follow-up visits at the regional breast cancer department. One year and 2 month later ultrasound showed a recurrence in the scare region of the breast. She was referred to the center where mammography, clinical examination and ultrasound were normal. A control at the center by physical examination concluded no sign of recurrence of cancer. The patient could feel the tumor by self examination 12 after it was seen in the size of 4 mm. It was admitted by her general practitioner to the regional breast cancer department and mastectomy was carried out.

### Case 4

A 58-years-old woman attended her gynecologist for a routine check-up including a clinical breast examination with ultrasound. Ultrasound revealed a 4 mm suspicious structure in her left breast. So small that it obviously was non-palpable. A shadow was cast behind the structure making it suspicious. She was admitted with suspicion of cancer to the regional breast cancer department, where the radiologist performed mammography, physical examination, and shallow ultrasound. The radiologist failed to see the tumor, claimed her breast healthy, and did not advice follow-up. Nineteen month later the patient noted a growing lymph node in her axilla. Biopsy showed metastasis and a breast cancer of 20 mm was diagnosed in exactly the same place as the initial 4 mm structure.

### Case 5

A 50-years-old woman attended her gynecologist for a routine

check-up including a clinical breast examination with ultrasound. Ultrasound revealed a 6 mm suspicious structure in her right breast. The gynecologist admitted her with suspicion of cancer to the regional breast cancer department, where the radiologist performed mammography, physical examination, and shallow ultrasound and failed to visualize the tumor, told her it was fibroadenomatosis only, so biopsy was not performed. She was advised no further ultrasound breast scanning by the gynecologist, and cancelled an appointment she already had for a control in case the cancer was not confirmed at the regional breast cancer department. Eighteen month later she could feel the tumor herself and was admitted to the regional breast cancer department by her general practitioner. She was operated for a 17 mm big lobular carcinoma with lumpectomy and lymph node resection of the axilla with several metastases. Mammography was negative.

### Case 6

A 43-years-old woman noted a growing lymph node in her left axilla. Mammography and ultrasound of both breasts showed no abnormalities. Biopsy of the lymph node was performed and microscopy indicated a ductal breast carcinoma. The regional breast cancer department performed MR scanning and PET-CT scanning in search for a breast cancer without being able to find the primary tumor. Another ultrasound was performed, but still without demonstration of any pathology. Lymph node resection of the axilla was carried out. The patient was about to start chemotherapy when she attended the gynecologist for a last search for the origin of her presumable breast cancer in the left breast. The examination by the gynecologist using simple ultrasound took place 7 weeks after mammography, 5 weeks after MR scanning, and 4 weeks after PET-CT scanning and revealed 2 tumors in the lateral part of the left breast measuring 8 and 4 mm, respectively. The regional breast cancer department was informed and lumpectomy was carried out.

## Discussion

Small structures in the breast are difficult to detect by palpation. Palpation will miss up till 50% of the cases seen by mammography [8,9]. As mammography in itself fails to reveal about 25% of the present cancers, a lot of cancers are missed and better modality is called for. Ultrasound has proven to be very important as a supplement to mammography [1-5] but larger and randomized studies comparing mammography and ultrasound have not been performed. The only study where ultrasound is used as first choice is not randomized and the included material is not large enough to prove ultrasound as the best modality to detect breast cancer [7]. All the cited studies give a hint, that ultrasound is superior to palpation and mammography.

The presented cases illustrate serious consequences for patients when mammography is trusted on behalf of meticulously performed ultrasound. Even when tumors were found and described by ultrasound the regional department appointed by the health authorities chose to neglect ultrasound results. In the official guidelines it is repeatedly stated that mammography is first choice and ultrasound is a good supplement for detecting early-stages of breast cancer. The data, however, suggest that ultrasound is a more sensitive modality and should be preferred as first choice to detect early-stage breast cancer.



Case 1, 4, and 5 gives an impression of the growth rate of breast cancer. It took between 16 and 19 month for the breast cancer to grow from a size of 4 to 11 mm to the size of 17-20 mm. It gives plenty of time for control visits when breast cancer suspicion is raised by ultrasound but not confirmed at the regional breast cancer department. In case 1 and 4 no control appointment was advised. In case 5 the patient was dissuaded to go back for an appointment at her gynecologist and she cancelled her appointment.

The patient in case 3 had been operated for a mammography negative breast cancer. She was controlled by palpation and mammography at the regional breast center. She came to the gynecologist for second opinion by ultrasound and a 4 mm suspicious tumor was seen. She was admitted to the center with suspicion of recurrence in the scare region of the breast. Still it was not detected by the procedures at the center, and the tumor grew further until the patient could feel it herself 12 month later.

Case 2 is a grotesque story of trust in mammography.

Case 6 shows the insufficiency of mammography, PET-CT, and MR to reveal a cancer in the breast even with a strong suspicion. Only meticulously performed ultrasound came up with the right answer and the precise location of the tumor(s).

When mammography is relied on as the best modality a serious delay in treatment followed in these cases. Precious month were lost for the treatment. With later diagnosis and more extended disease more post-treatment is required. Lymph node resection, chemotherapy, anti-hormonal treatment, and radiation treatment are all hard to go through for breast cancer patients and with long term consequences on body functions.

A suspicion for breast cancer raised by ultrasound should never be neglected; biopsy as recommended in Triple Test and follow-up should be advised. A better training in ultrasound of medical personal dealing with breast cancer is called for.

## References

1. Buchberger W, DeKoekkoek-Doll P, Springer P, Obrist P, Dunser M. Incidental findings on sonography of the breast: clinical significance and diagnostic workup. *AJR*. 1999; 173: 921-927.
2. Zonderland HM, Coerkamp EG, Hermans J, van de Vijver, van Voorthuisen MD. Diagnosis of breast cancer: contribution of US as an adjunct to mammography. *Radiology*. 1999; 213: 413-422.
3. Kolb TM, Lichy J, Newhouse JH. Comparison of the performance of Screening mammography, Physical Examination, and breast US and evaluation of factors that influence them: an analysis of 27,825 Patient Evaluations. *Radiology*. 2002; 225: 165-175.
4. Flobbe K, Nelemans PJ, Kessels AG, Beets GL, von Meyenfeldt MF, van Engelshoven JM. The role of ultrasonography as an adjunct to mammography in the detection of breast cancer. A systematic review. *Eur J Cancer*. 2002; 38: 1044-1050.
5. Xuexiang Y, Yanping L, Xiaotian X, Bin Hu, Zhuhua, pingqing MM. A comparison of mammography and Ultrasound in Woman with breast Disease: A Receiver Operating Characteristic Analysis. *Breast Journal*. 2012; 18: 130-138.
6. DBCG retningslinjer for diagnostik af brystkræft. 2011.
7. Lenz S. Breast Ultrasound in office Gynecology – ten years of experience. *European J Ultrasound*. 2011; 32: 3-7.
8. Miller AB, Baines CJ, To T, Wall C. Canadian National Breast Screening Study: 1. Breast cancer detection and death rates among women aged 40-49 years. *CMAJ*. 1992; 147: 1459-1476.
9. Miller AB, Baines CJ, To T, Wall C. Canadian national Breast Screening Study 2. Breast cancer detection and death rates among women aged 50-59 years. *CMAJ*. 1992; 147: 1477-1488.