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Breast fine needle aspiration: (for which patients) is it still feasible? An analysis of 2419 cases

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Background: We aimed (1) to assess the conclusiveness of fine needle aspiration (FNA) in a histologically confirmed population of more than 2400 breast lesions, and (2) to evaluate whether FNA conclusiveness can be predicted from clinical and radiologic parameters.

Materials and Methods: We collected data on all histologically confirmed breast lesions presenting between 1999–2007. Aspirates were diagnosed as inadequate, benign, atypical, suspicious or malignant. We defined a conclusive FNA diagnosis as 'benign' in histologically benign lesions and as 'malignant' in histologically malignant lesions.

Results: In 2419 breast lesions, the proportion of conclusive diagnoses was 46.1% (95% confidence interval, 42.0%-50.2%) in histologically benign lesions (n = 571) and 81.6% (95% confidence interval, 79.8%-83.4%) in histologically malignant lesions (n = 1848). On multivariate analysis, factors associated with a conclusive preoperative diagnosis included tumour diameter of 2−2.9 cm (P < 0.001), malignant histology (P < 0.001) and the pathologist examining the aspirate (P = 0.015).

Table. Logistic regression analysis of factors influencing the conclusiveness of preoperative FNA diagnosis in 2349 benign and malignant breast lesions

Factor	Odds ratio (95% CI)	P-value
Age (years)	1.00 (0.99–1.01)	0.784
Palpable (vs. nonpalpable)	1.21 (0.95–1.53)	0.129
Mammographic aspect	–	0.491
Microcalcifications vs. mass	1.06 (0.78–1.45)	0.714
Architectural distortion vs. mass	0.75 (0.48–1.18)	0.213
Negative mammogram vs. mass	1.08 (0.80–1.44)	0.626
Tumor size	–	<0.001
1−1.9 cm vs. <1 cm	0.96 (0.80–1.15)	0.659
2−2.9 cm vs. <1 cm	1.82 (1.45–2.28)	<0.001
3−3.9 cm vs. <1 cm	1.28 (0.95–1.71)	0.101
4−4.9 cm vs. <1 cm	0.96 (0.64–1.43)	0.833
⩾5 cm vs. <1	0.92 (0.64–1.31)	0.623
Malignant histology (vs. benign)	4.81 (3.80–6.10)	<0.001
US-guidance (vs. freehand)	1.33 (0.95–1.86)	0.095
Pathologist	–	0.015

There were 70 cases (2.9%) with missing data.
An odds ratio >1 indicates an increased probability of obtaining a conclusive FNA.
FNA, fine needle aspiration; CI, confidence interval; US, ultrasound.

Conclusions: Breast FNA is of limited use in the routine work-up of breast lesions. At best, it may be used in larger breast lesions with low clinical and radiologic grade of suspicion, to avoid some, but far from all, unnecessary excisions. In more suspicious lesions, FNA can be used to obtain a quick confirmation of malignancy, followed by a core needle biopsy for determination of further tumour characteristics.

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Surveillance of gene mutation carriers with mammography, ultrasound, and magnetic resonance imaging: results of a multicentric prospective trial (REMAGUS interdisciplinary group)

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Background: to evaluate the performance of annual breast MRI compared to standard imaging in gene-mutation carriers.

Material and Methods: Between February 02 and January 05, 202 women (written informed consent) were prospectively recruited by 3 cancer centers for a surveillance protocol of 5 years (clinical examination/6 months, annual mammography, ultrasound and MRI performed within a delay <3 months). Final analysis was based on a population of 199 women (mean age: 45 years, *BRCA*1= 61.8%, *BRCA*2= 37.7%, p53= 0.5%); 97 women (48.7%) were previously treated for a breast cancer (bilateral cancers =11, 30 mastectomies). MRI and standard imaging examinations were independently analyzed; BI-RADS was used for interpretation and lesion categorization.

Results: During follow-up (round 1 = 199, round 2 = 182, round 3 = 168, round 4 = 159, round 5 = 134, 6 deaths), 44 cancers were diagnosed including 5 interval cancers (11.3% of all cancers). Among the 39 cancers detected by imaging (18 new cases, 12 controlateral cancers, 9 local relapses), 12 were detected at the first round, 5 at the second, 11 at the third, 6 at the fourth and 5 at the last round. At pathology, 33 were invasive carcinomas (ductal = 26, lobular = 3, mixed =1, others =3) and 6 ductal carcinomas in situ. These cancers (n = 38, one case excluded − missing data) were detected by all the imaging modalities (BI-RADS categories 4 or 5) in 17 cases (42.1%), by standard imaging alone in 1 case (2.6%, invasive ductal carcinoma), by MRI alone in 10 (26.3%). In 6 cases (15.8%), MRI upgraded the BI-RADS categories of standard imaging (from probably benign 3 to suspicious 4 or 5) whereas in 3 cases (7.9%) MRI downstaged the standard imaging BI-RADS categorization. All imaging modalities classified an invasive cancer as benign or probably benign. This surveillance generated benign percutaneous procedures in 54 women (27%) and a short-time follow-up recommendation with MRI in 32%, 34%, 27%, 19% and 13% according to the successive rounds.

Conclusions: Adding MRI to standard imaging allows a better detection and characterization of breast cancers in gene-mutation carriers but also substantially increases the number of short-time follow-up recommendations.

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Penetrance of breast cancer, ovarian cancer and contralateral breast cancer in BRCA1 and BRCA2 families

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Background: An accurate estimation of the lifetime risk of breast and ovarian cancer is crucial in counseling families with a *BRCA1* or *BRCA2* mutation. In this study we determined breast and ovarian cancer penetrances in *BRCA1* and *BRCA2* families in the Northern Netherlands and compared these with the general female population in the region.

Methods: In 185 families with a pathogenic *BRCA1* or *BRCA2* mutation, all female mutation carriers and first degree female relatives were identified, in total 1188 women. Occurrence of breast cancer, contralateral breast cancer and ovarian cancer was recorded.

The cumulative incidence of breast cancer by age 70 was 71.4% (95% CI 67.2–82.4%) in *BRCA1* and 87.5% (95% CI 82.4–92.6%) in *BRCA2* mutation carriers. The cumulative incidence of ovarian cancer was 58.9% (95% CI 53.5–64.3%) in *BRCA1* and 34.5% (95% CI 25.0–44.0%) in *BRCA2* mutation carriers.

Results: The annual breast cancer incidence for *BRCA1* mutation carriers is highest between age 40 and 50 (0.043) and for *BRCA2* carriers between 60 and 70 years of age (0.115). For ovarian cancer the annual incidence is highest between 60 and 70 years of age for both *BRCA1* (0.049) and *BRCA2* (0.065) mutation carriers.

Conclusion: This study presents breast and ovarian cancer penetrances in a well defined population of proven *BRCA1* and *BRCA2* carriers, assessed in a clinical genetic setting in a large Dutch region. Because of the high breast cancer incidence after 60 years for *BRCA2* mutation carriers, it could be discussed to prolong breast screening for *BRCA2* carriers till 70 years of age.