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Pneumocystography in nonpalpable breast cysts: effect on remission rate

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ABSTRACT

The purpose of the study was to evaluate the effect on remission rate after pneumocystography among nonpalpable cysts. A series of 206 nonpalpable cysts aspirated using the perforated compression plate technique was reviewed. The effect on remission was evaluated on mammograms obtained 1-3 years after the cyst aspiration. Logistic regression was used to compare the effect between those examined with pneumocystography (n=62) and those aspirated alone (n=144). The ratio of complete remission was 52% (32/62) with pneumocystography compared to 53% (76/144) without. In univariate analysis there was no association between pneumocystography and complete remission. However, complete emptying of the cyst was significantly associated with complete remission (OR = 1.85, 95%CI = 1.05–3.25). In a multivariate model, complete emptying without pneumocystography was significantly associated with complete remission (OR = 2.40, 95%CI = 1.14–5.02) but not complete emptying in combination with pneumocystography (OR = 0.84, 95%CI = 0.24–2.89). Pneumocystography showed a close to two-fold association with complete remission. However, this association was not statistically significant (OR = 1.92, 95%CI = 0.52–7.05). In conclusion, complete emptying of a nonpalpable cyst significantly increased the chance of complete remission when pneumocystography was not performed. Pneumocystography showed no significant effect on remission rate.

INTRODUCTION

Cystic breast disease is a well-known cause for breast lumps in women approaching menopause. Nonpalpable breast cysts are a common finding in screening mammography. These cysts usually appear as newly developed or progressively growing rounded masses which can be difficult to differentiate from small breast cancers by mammography alone. Cysts can be diagnosed with fine-needle aspiration (FNA) or ultrasound (US). Pneumocystography (PCG), i. e. FNA in combination with air insufflation, was reported to be a valuable diagnostic tool to differentiate between benign cysts and cysts with intracystic neoplastic growth (4). Furthermore, PCG has a therapeutic effect in preventing relapse of palpable cysts (1, 5). Similar effect on nonpalpable cysts was reported by Ikeda et al (2). The aim of the study was to evaluate the effect of PCG on the remission rate of nonpalpable breast cysts.

MATERIAL AND METHODS

All cases were collected from a consecutive series of 5,013 women recalled in the Uppsala screening program from the start of the second administrative screening round in March 1990 until June 1994. The screening program has been described in detail elsewhere (6). All cystic lesions from the above-described group where FNA using the perforated compression plate were done and had mammograms within 1–3 years after the procedure were reviewed. Cysts that were aspirated using stereotactical guidance were not included in the study because there were only isolated cases of PCGs performed among these cases. A total of 206 cysts in 199 women fulfilled the above described criteria. The median age was 51 years (range 39–74 years). The mammographic follow-up was generally the following screening mammogram done at an average of 22.3 months after the aspiration. In 4% (9/206) the mammogram was a clinical mammographic consultation.

US examinations were performed by the attending radiologist using an Ultramark 2 with a 7.5 MHz transducer. US was done in 48% (98/206) of the cystic lesions prior to the FNA. Data from the results of the US examinations were prospectively stored in the patient-administrative database during the latter part of the study period. However, these data did not give clear information on whether a visualised mass was judged as cystic or solid. There were 14% (8/57) cystic lesions missed with US during the latter part of the study period.

FNA was performed with the patient in the sitting position, using a CGR Senographe 500 T equipment with an add on perforated compression plate unit. The technique of puncture as described by Mühlow (3), i.e., the lesion is localized in two planes and punctured through the nearest hole of the plate, was followed. In case of a possible cystic diagnosis, a post puncture mammogram was usually performed. However, this was not done in 3 cases in this series.

The examinations were reviewed by one radiologist who noted the following variables: PCG (yes/no), size of lesion and accomplishment of initial emptying (complete, partial or unclear). The remission at follow-up was also evaluated (complete, partial, unclear or relapse).

Odds Ratios (OR) with 95% confidence interval (CI) for logistic regression were calculated with StatView 5 program (SAS institute Inc., Cary, North Carolina).

RESULTS

The median size of all cysts was 12 mm (range 4-50 mm). The median size of the 62 cysts examined with PCG was larger than the 144 cysts without PCG, 18 mm versus 12 mm. At the initial examination, the ratio of complete cyst emptying was higher in the PCG group, 79% (49/62) versus 53% (Table 1). Fewer in the PCG group had complete remission at follow-up among the completely emptied cysts, 51% (25/49) versus 63% (48/76) (Table 2). However, the ratio of complete remission at follow-up was practically the same in both groups; 52% (32/62) in the PCG group compared to 53% (76/144) in the other group.

Using univariate analysis, no association between PCG and complete remission at the follow-up was found (0.95, CI = 0.53–1.73). However, complete emptying of the

Table 1. Immediate results of intervention in cysts examined with or without PCG.

	Complete emptying		Partial emptying		Unclear emptying		Total	
PCG	49	79%	13	21%	0	0%	62	100%
No PCG	76	53%	49	34%	19	13%	144	100%
Total	125	61%	62	30%	19	9%	206	100%

Table 2. Remission at follow-up by initial emptying for cysts examined with or without PCG.

	Complete emptying		Partial emptying		Unclear emptying		Total	
PCG	25/49	(51%)	7/13	(54%)	0		32/62	(52%)
No PCG	48/76	(63%)	21/49	(43%)	7/19	(37%)	76/144	(53%)
Total	73/125	(58%)	28/62	(45%)	7/19	(37%)	108/206	(52%)

Table 3. Multivariate odds ratios (with 95% confidence interval) for complete remission at follow-up with incomplete emptying as the reference.

PCG	1.92	(0.52–7.05)
Diameter continuos (mm)	0.98	(0.94–1.02)
Unclear emptying (no PCG)	0.79	(0.26–2.35)
Complete emptying at PCG	0.84	(0.24–2.89)
Complete emptying without PCG	2.40	(1.14–5.02)

cyst was significantly associated with complete remission at follow-up (OR = 1.85, CI = 1.05–3.25). In multivariate analysis (Table 3), complete emptying with or without PCG was analysed as separate variables. Complete emptying without PCG was significantly associated with complete remission at the follow-up (OR = 2.40, CI = 1.14–5.02) but not complete emptying in combination with PCG (OR = 0.84). In this multivariate model, PCG showed a close to two-fold increased chance for complete remission at follow-up. However, this association was not statistically significant as shown by the 95% confidence limits (OR = 1.92, CI = 0.52–7.05). In other multivariate models including age or handling diameter as a dichotomised or categorised variable, the results of the other variables were similar to the presented results (data not shown).

DISCUSSION

PCG could not be shown to have a significant effect on remission rate in nonpalpable cysts. On the other hand, complete emptying of a cyst without PCG increased the rate of remission. The observed remission rate of 52% (32/62) in nonpalpable cysts examined with PCG is far less than reported in two studies of palpable cysts. Tabár

et al reported a remission rate of 88% (114/130) on the first attempt and 97% (126/130) after repeated PCG with a 1-year follow-up period (5). Dyreborg et al reported 95% (111/117) remission rate with PCG in palpable benign cysts during a 6-month follow-up (1).

The primary aim of FNA in the work-up of recalled women was to differentiate between cystic and solid rounded masses. US was not a reliable method for this task with the equipment available since some cysts were missed and other cysts were not anechoic. The rationale for emptying a recalled cystic lesion was to minimise difficulties in the future evaluation of a breast with a growing cyst. Obviously, US-guided FNA can also be used to empty cystic lesions. The reasons for performing PCG were to diagnose intracystic neoplastic growth and lessen the risk of relapse.

One report has addressed the effect of PCG on nonpalpable cysts. Ikeda et al reported of a series of 41 nonpalpable cysts of which 18 were treated with PCG (2). The remission rate was 78% (14/18) in the PCG group after 3 years follow-up, a result higher than in the present study. They also reported a lower remission rate of 43% (10/23) at follow-up among the group examined with FNA alone compared to the present study. Ikeda et al concluded after doing Fisher's exact test that nonpalpable breast cysts are less likely to recur than cysts treated by aspiration alone. However, the outcome of the statistical test can be criticised since it was performed twice after exclusion of 4 and 7 cases, respectively. Fisher's exact test would not become statistically significant without these exclusions ($p = 0.06$).

The present study reviewed a larger series of nonpalpable cysts than that of Ikeda et al (2). The rate of complete remission was almost the same in the group examined with PCG compared to the group aspirated alone. On the other hand, complete emptying of the cyst was significantly associated with complete remission when PCG was not done but seemed to have of no significance when PCG was done. The rationale for dealing with complete emptying with or without PCG as separate variables in the multivariate analysis was that the effect might differ because of air insufflation at PCG. A possible positive effect of PCG on the remission rate of nonpalpable cysts cannot be excluded since there was a close to two-fold increased chance of remission for cysts treated with PCG after correcting for size and emptying. However, this observation was not statistically significant.

In conclusion, complete emptying of a nonpalpable cyst significantly increased the chance of complete remission when pneumocystography was not performed. No significant effect on remission rate was shown with pneumocystography.

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