Radiol Oncol 1994; 28: 134-7.

Breast tumor aspiration biopsy with a multihole needle

Veljko Vlaisavljević[1] and Dubravka Paja-Perušić[2]

[1]Department of Gynecology, [2]Department of Pathology, Maribor Teaching Hospital, Maribor, Slovenia

In 36 patients, breast tumors or palpable breast masses were punctured with a standard fine needle and a multihole needle. Equal quality of cell material for cytologic investigation was found with both methods, but a significantly larger quantity of material was aspirated (in punctures) using the multihole.

Key words: breast neoplasms – methodology; biopsy, needle; cytology, aspiration biopsy, technique

Introduction

Breast tumor aspiration with a fine needle is a routine method without which it is difficult to organize the complete diagnosis of breast diseases. According to the data from the review article by Us-Krašovec et al. (1982), the percentage of correct diagnoses in breast cancer obtained by cytologic analysis of aspirates ranges from 77–92.3 %. The percentage of false positive (0.2–1.6 %) and false negative (3.2–11.5 %) results is within sufficiently low limits. Similar results were also registered at our institution.[1]

A serious drawback of cytologic diagnosis is a problem which is often not within the power of the cytologist to solve: (not enough) insufficient quantity of diagnostically relevant material. The cause may lie in inadequate collection or poor preparation of biopsy specimens, in greasy plates preventing fixation of specimens, or in the nature of the punctured lesion itself. This is often the case in cyst aspirates where there is little cell material, or in scirrhous carcinoma aspirates where the presence of the epithelial component of tumor is minimal. Thus, various authors report on 3.3–7.9 % of unsuccessful biopsies among carcinomas and on a significantly larger share among benign breast lesions (9.0–24.1 %).[1–4]

Aspiration biopsy of the suspicious breast area presents a special problem when there is no palpable tumor. Increased nodosity is not always the result of proliferation of the glandular component of breast tissue. The amount of glandular tissue varies strongly with regard to breast type and the woman's age. In premenopause it amounts up to 20 %, in postmenopause only up to 2–5 %. In this period of time the share is fatty (50–70 %) and connective tissue (30–40 %) is prevailing. Such transformation of the breast makes collection of representative cytologic samples for analysis difficult.

The aim of our study was to compare the success of puncture using a fine needle – fine

Correspondence to: Veljko Vlaisavljevič, M. D., Ph. D., Department of Gynecology, Maribor, Teaching Hospital, Ljubljanska 5, 62000 Maribor, Slovenia.

UDC: 618.19-006.6-076

needle aspiration cytology (FNAC) with that using a needle with several openings – multihole needle aspiration cytology (MHNAC). This would offer a greater possibility of obtaining an aspirate from a correct site and in a sufficient amount. The needle was made in the needle factory in Kobarid (TIK) according to description from literature.[5]

Some authors report that by using a fine needle with several side openings (a multihole or MH needle) they obtain more cell material for analysis and get better diagnostic results (5). It was our aim to establish whether biopsy specimens obtained by puncture with a MH needle contain an equal, larger or smaller amount of cell material than specimens obtained with a standard fine needle.

Material and methods

The multihole needle was made for research purposes in the TIK factory. For its fabrication a standard disposable needle was used, with three additional openings made at its distal end. Two openings were on the same level and one was on the opposite side.

The technique of aspiration using the MH needle was identical to that used in punctures with the fine needle. Since we were comparing the quality of smears obtained with two different needles, each lesion was punctured in the same manner through the same needle insertion site.

Before puncture, the skin was disinfected. The first puncture was done with a fine needle. A Cameco puncture pistol and a 10 ml syringe were used. The contents of the lesion were aspirated while moving the needle forwards and backwards in different directions through the lesion and simultaneously rotating the syringe. Then the puncture was continued with a MH needle. It was introduced through the same insertion point and the same puncture technique was used. The aspirate was squirted onto a specimen plate and larger pieces of tissue were crushed with the needle.

Cell material obtained by aspiration puncutre was smeared on 2–3 specimen plates, fixed and stained in the cytological laboratory according to three staining methods: May Grünwald-Giemsa, Papanicolaou and hematoxylineosin.

Every pathologic process which could be localized, irrespective of whether it was suspicious or not, presented an indication for aspiration puncture with a fine needle.

The cytologic findings were classified into negative, suspicious and positive. Negative cytologic findings mean the presence of normal glandular epithelium of the breast with or without cellular atypia and the presence of cells of benign breast dysplasia.

Cytologic findings are considered suspicious when according to their morphology and their distribution the cells give the impression of a malignant process, and for certain reasons the cytologist cannot take the responsibility for the subsequent radical therapy. Positive cytologic findings mean the presence of malignant cells in the smear of the tumor biopsy specimen.

Biopsy specimens with little or insufficient cell material for cytologic investigation are rather questionable. In view of the fact that cytodiagnosis is a subjective diagnostic method, it is often difficult to determine the limit at which the aspirate is still adequate for investigation and to decide whether a certain number of cells in the aspirate still gives a sample representative for cytologic investigation. In cytologically negative findings with little cell material it is therefore difficult to determine whether they really are negative, taking into account that a high percentage of false negative findings can follow as a result of misinterpretation. In such cases a repeated puncture and follow-up investigation are recommended.

Statistical significance was tested with the chi-square test.

Results and discusion

In our Breast Diagnostic Center, 37 MHNAC and 41 FNAC were carried out in 36 patients.

In 30 patients the same tumor was punctured with a fine and with a MH needle, in 6 patients the puncture was carried out only with the MH needle; 1–4 punctures were done in each patient.

In FNAC, the number of aspirates with an insufficient amount of cell material was larger (n = 18) than in punctures with the MH needle (n = 13), but in specimens obtained with FNAC, the number of positive cytologic findings was larger (n = 7) than in those obtained with the MH needle (n = 5). In both groups the difference was not statistically significant. These two positive cytologic results in aspirates obtained with FNAC we suspicious in aspirates with the MH needle (in one case the amount of cell material in the sample was smaller, in the second case the cell material was less representative – probably obtained by puncture from the tumor margin). The number of suspicous specimens was the same with both types of needle (n = 7). Negative findings were observed more frequently in MH needle group (n = 12 vs. 9)

In 30 patients the cytologic findings and the quantity of cell material obtained by FNAC and MHNAC were compared.

In one third of our cases (10 out of 30) an approximately equal quantity of cell material was found, meaning that the cell sample was equally representative in aspirates with the standard fine needle and with the MH needle.

A more representative cell sample was also found in about one third of cases in aspirates obtained with the MH needle (8 out of 30) and in those obtained with the fine needle (12 our of 30).

Factors affecting the sensitivity of FNAC of the breast include the aptitude of the aspirator, the experience of the cytopathologist, the size of the lesion and certain histological cancer types.

By means of MHNAC we wished to improve the sampling of the punctured lesions. We assumed that the quantity of the material would be larger while the number of inadequate samples would be smaller. This would enable safer application of aspiration cytology for the final definition of benign lesions and conservative treatment of benign tumors.

Today numerous authors speak in favour of a second benign FNAC sample before patients with palpable benign lesions can meet the criteria for conservative management.[6] The reason for this lies above all in the possibility of avoiding the risk of inadequate sample collection in eventual carcinoma.

We believe that the described technique can bi particularly successful in ultrasonically quided punctures as well as in punctures of benign palpable breast masses.

Conclusion

The comparison of puncture biopsy specimens obtained with the standard fine needle and the MH needle revealed approximately equal quality of cell material for cytologic investigation. The quality of the cell material itself did not differ essentially, in spite of the fact that a significantly larger quantity of material was obtained using the MH needle. It would only be possible to assess the value of MHNAC on the basis of a study comprising a larger number of aspirates from palpable and nonpalpable breast lesions.

Acknowledgement

The author wishes to thank Marijana Gajšek-Marchetti, translator at the Medical Research Department, for her contribution in translating the manuscript.

References

1. Paja-Perušić D. Aspiracijska citologija v diagnostiki bolezni dojk. *Zbornik mariborskega ginekološko-porodniškega srečanja,* Maribor, 1982: 61–8.
2. Us-Krašovec M, Golouh R, Lamovec J. Aspiracijska biopsija tumorjev dojke. *Zdrav Vestn* 1982: **51:** 549–53.
3. Vlaisavljević V, Paja-Perušić D, Gorišek B, Rauter Z. Ciste dojke – dijagnostika i liječenje. *Jugosl Ginekol Perinatol* 1985; **25:** 125–8.

4. Ciatto S, Cariaggi P, Bulgaresi P, Confortini M, Bonardi R. Fine needle aspiration cytology of the breast: review of 9533 consecutive cases. *Breast* 1993; **2:** 87–90.

5. Vorhererr H. Breast aspiration biopsy with multihole needles for histologic and cytologic examination. *Am J Obstet Gynecol* 1985; **151:** 70–6.

6. Paraskevoupoulos J, Newton L, Stephenson T, Shorthouse A. Breast audit: a second fine needle aspiration cytology is advisable to exclude malignancy. *Breast* 1993; **2:** 91–2.