

MAMMOTOME BIOPSY IN DIAGNOSING AND TREATMENT OF INTRADUCTAL PAPILLOMA OF THE BREAST

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Intraductal papilloma is a benign breast tumor which needs histopathological verification because of the risk of cancer coincidence.

The aim of the study was to assess the value of the mammography-guided and ultrasound-guided vacuum-assisted core biopsy in the diagnosis and treatment of intraductal papillomas of breast and to answer the question if mammotome biopsy allows to avoid surgery in these patients.

Material and methods. In the period 2000-2011, a total of 2246 vacuum-assisted core biopsies were performed, of which 1495 were ultrasound-guided and 751 were mammography-guided (stereotaxic). In 76/2246 patients (3.4%), aged 19-88 years (mean age was 51,5) histopathological examination confirmed intraductal papilloma.

Results. Atypical lesions were accompanying intraductal papilloma in 16/76 cases (21%). Open surgical biopsy performed in these group revealed invasive cancer in 3 women. In all 60 cases (79%) with benign papilloma in biopsy specimens, further clinical observation did not show recurrence or malignant transformation of lesions.

Conclusions. Vacuum-assisted core biopsy is a minimally invasive and efficient method used for diagnosing intraductal papilloma of the breast. If histopathological examination confirms a benign character of the lesion, surgery may be avoided but regular follow-up is recommended. However, in all cases histopathological diagnosis of papilloma with atypical hyperplasia, should always be indication for surgical excision.

Key words: intraductal papilloma, vacuum-assisted core biopsy, mammotome biopsy

Intraductal papilloma of the breast is a benign tumour which is usually diagnosed in women between 30 and 55 years of age. According to the literature, it affects 2-3% of female population (1, 2) and not infrequently accompanies malignant hyperplastic lesions. Single papillomas occur mainly near the nipple and are more common in premenopausal women. Multiple papillomas are usually located peripherally and are associated with higher risk of cancer (3, 4). Clinical signs of papilloma include greenish, brown or bloody

discharge from the nipple and occasionally a palpable lump within the breast. However, frequently no signs occur and the lesion is found incidentally (3). The diagnostic work-up includes mammography (MMG), ultrasonography (USG), galactography, cytological examination of the nipple discharge, fine-needle or core biopsy and open surgical biopsy.

Breast papillomas are relatively rare but due to no clear-cut management algorithm, they can pose a diagnostic challenge for radiologists, surgeons and pathologists (2). Most

authors think that papilloma in patients with bloody discharge from the nipple, a palpable lump (particularly located peripherally in the breast) or in whom malignant transformation is suspected based on imaging examination surgical excision of the lesion is necessary (5, 6). Undoubtedly, surgery is necessary in patients with atypia or signs of malignant transformation found on biopsy. Most controversies are related to the management of asymptomatic patients with benign papilloma found on core biopsy (1, 7, 8, 9). There have been an increasing number of reports on the effectiveness of mamotome biopsy (MB) in diagnosing and treating intraductal papilloma of the breast (1, 3, 8, 10). It particularly applies to patients with no clinical or pathological signs of increased risk for malignant transformation (11, 12).

The aim of the study was to assess the value of ultrasound-guided mamotome biopsy (MB) or mammography (stereotactic) in diagnosing and treating intraductal papilloma of the breast and attempt to find out whether or not they allow avoiding surgery in this group of patients.

MATERIAL AND METHODS

Between 2000 and 2011, in the Regional Outpatient Clinic for Early Detection and Treatment of Breast Diseases of 1st Department of General Surgery of UJ Collegium Medicum in Cracow, the total of 2,246 mamotome biopsies were performed, of which 1,495 were ultrasound-guided and 751 mammography-guided (stereotactic). In 76/2,246 patients (3.4%), histopathological examination revealed intraductal papilloma. The study subjects' age ranged between 19 and 88 years, the mean age being 51.5.

All the patients underwent breast ultrasound examination and patients aged 40 and over had an additional mammography. The analysis included: lesion dimensions as found on MMG or USG, lesion location within the breast – peripheral (lesion located in 1/3 of the outer part of the breast) or centrally, lump found on physical examination, nipple discharge and BIRADS (Breast Imaging-Reporting and Data System) classification of the lesion.

Needles with diameters of 10G (Encor) and 11G (Mamotome) were used in biopsies. The

number of specimens collected ranged between 5 and 14, the mean number being 7. Biopsy duration ranged between 10 and 20 minutes. Routinely, a pressure dressing was applied to the biopsy site for 24 hours. The following patients were excluded: not consenting to biopsy, allergic to local anaesthetics and having active skin infections in the breast area.

The tissue specimens were fixed in 10% formalin and then sent for histopathological examination to the Department of Pathomorphology of UJ Collegium Medicum.

Women in whom histopathological examination revealed benign papilloma were followed-up and underwent periodic clinical examination and mammography/ultrasonography after 3 and 6 months, and subsequently at one year intervals. The follow-up period ranged between 14 months and 10 years, the mean follow-up being 5 years. If histopathological examination of the biopsy specimen revealed papilloma accompanied by atypical hyperplasia, patients were qualified for the second stage open surgical biopsy.

RESULTS

The dimensions of biopsy specimens ranged between 3 mm and 18 mm, the mean dimension being 7 mm. Parameters such as location in the breast, clinical evaluation and assessment of lesions on MMG/USG have been presented collectively in tab. 1.

Of all 76 biopsies, 54 were ultrasound-guided (71%) and 22 were digital mammography-guided (39%). Morphologically, papillomas presented on ultrasound as solid nodular lesions, complex cysts or pattern distortions. Mammography revealed shadowing, clusters of microcalcifications and distorted architecture of breast parenchyma (tab. 2).

16/76 patients (21%) in whom papillomas with signs of atypical hyperplasia were found on MB were qualified for open surgical biopsy. In eight patients, the final histopathological examination revealed no atypical lesions. In two patients, it revealed atypical intraductal hyperplasia which was excised with a healthy tissue margin. In one patient, it revealed a radial scar. In three other patients, it revealed invasive cancers – two intraductal infiltrating cancers and one lobular infiltrating cancer (tab. 3). Clinical and pathological features of

Table 1. Clinical and morphological features of biopsy specimens of lesions

Clinical and morphological features of biopsy specimens of lesions	Number of cases n	Percentage of patients %
Right breast	34	42,7
Left breast	42	57,3
Upper outer quadrant	27	35,5
Upper inner quadrant	23	30,2
Lower outer quadrant	16	21
Lower inner quadrant	10	13,3
Nipple discharge	74	97,4
No nipple discharge	2	2,6
Non-palpable lesion	75	98,7
Palpable lesion	1	1,3
Centrally located lesion	55	72,3
Peripherally located lesion	21	27,7
Lesion dimensions < 10 mm	50	65,8
(longest dimension on USG/MMG) \geq 10 mm	26	34,2
BIRADS classification of lesions (USG/MMG)		
Grade 3	2	2,6
Grade 4a	70	94,8
Grade 4b	1	1,3
Grade 4c	3	1,3

Table 2. Morphology of intraductal papillomas on imaging examinations

Examination type	Morphology of lesions	Number (n)	Percentage (%)
USG	solid nodular lesion	46	85,2
	complex cyst	6	11,1
	pattern distortion	2	3,7
MMG	shadowing	10	45,4
	cluster of microcalcifications	10	45,4
	distorted architecture	2	9,2

Table 3. Results of histopathological examination of specimens collected in open surgical biopsies of atypical papillomas found on BM

Results of histopathological examination of specimens collected in mammotome biopsies	Number of patients	Results of histopathological examination of specimens collected in open surgical biopsies	Number of patients
Papilloma with atypical hyperplasia	16	papillomatosis	4
		hyperplasia without atypia	4
		atypical hyperplasia	2
		radial scar	1
		invasive ductal cancer	2
		invasive lobular cancer	1

lesions finally diagnosed as cancer have been presented in tab. 4.

In 50/76 patients (80.6%), histopathological examination of mammotome biopsy specimens revealed benign papilloma without signs of atypia. Longitudinal follow-up of these patients was applied. At successive follow-up imaging examinations, no recurrence of papil-

loma or its malignant transformation was found in any patient.

DISCUSSION

Algorithm of diagnostic and therapeutic management of patients with intraductal papil-

Table 4. Clinical and pathological features of breast cancer lesions found on open surgical biopsy

No	MMG	USG	Dimensions (mm)	BIRADS	Mammotome biopsy	Open surgical biopsy
1	no lesions	lump	9x6	4c	papilloma with atypical hyperplasia	invasive lobular carcinoma
2	microcalcifications	no lesions	8x4	4c	papilloma with atypical hyperplasia	invasive ductal carcinoma
3	shadowing	lump	8x4	4c	papilloma with atypical hyperplasia	invasive ductal carcinoma

illoma of the breast have been changing over years. At the beginning of the previous century, patients in whom papilloma was suspected and bloody nipple discharge occurred underwent breast amputation. Later on, excision of the papilloma and a breast fragment and – if possible – isolated excision of a changed milk duct was applied (10, 13, 14). At present, it is thought that surgery is necessary in the case of papillomas with signs of cellular atypia or a concurrent malignant process. However, the management algorithm in benign papilloma is still controversial (14). In the opinion of many authors', if a benign nature of papilloma has been confirmed on mammotome biopsy, surgery can be avoided (3, 4, 15). However, it should be emphasised that differentiating between benign and malignant lesions can pose a diagnostic challenge.

Fine needle aspiration biopsy is a minimally invasive technique, but it has low efficiency in diagnosing intraductal papillomas of the breast (13). On the other hand, open surgical biopsy is characterised by high diagnostic accuracy, but it is more invasive and is associated with the excision of a breast parenchyma fragment, possible deformation and a scar. The development of minimally invasive techniques for diagnosing focal lesions in the breast, such as mammography-guided or ultrasound-guided mammotome biopsy, provided interesting alternatives to open surgical biopsy (5, 16, 17). This new modality is minimally invasive, well tolerated by patients, effective and has low complication rate. It has high diagnostic accuracy, reaching 98-100% (18), and comparable with that of the open surgical biopsy, with markedly lower level of invasiveness and relatively lower costs.

The diagnosis of papilloma with signs of atypia based on histopathological examination is always an indication to open surgical

biopsy due to high risk of malignant transformation. According to various authors, it ranges between 3% and 100%, the mean risk being 30% (9, 13, 19, 17, 20, 21). Chang analysed a group of 60 patients with papilloma found on biopsy. In 49, benign lesions were found. In 11, lesions had signs of atypia. Then, all the patients underwent open surgical biopsy. In the first group, no malignant lesions were found in any patient; in the other group, preinvasive ductal cancer was found in two patients. Cancer was found statistically more often in patients with lesions classified as BIRADS grade 4b (5). In our study, in the group of 16 patients with atypical papillomas found on biopsy, invasive cancer was found in three. In all the cases, lesions were classified as BIRADS grade 4c based on imaging examinations. This proves that if clinical picture is not consistent with the result of histopathological examination, open surgical biopsy is necessary.

In our study, all the patients with benign papilloma found on biopsy were followed-up for many months. The mean follow-up period was 5 years. No recurrence of papilloma or its malignant transformation was found in any patient (18, 22). Maxwell analysed 26 cases of benign papilloma excised using core biopsy. In 23 patients followed-up after biopsy (for the mean period of 31 months), no recurrence of papilloma or signs of malignancy were found (3). Another three patients were qualified for open surgical biopsy due to recurrence at the biopsy site. However, the final histopathological examination confirmed the benign nature of the excised lesions. Similar results, indicating that in patients with benign papilloma without signs of atypia, excised using mammotome biopsy, surgery can be abandoned, have been reported also by Dennis (10), Renshaw (19) and Carder (21).

The risk of papilloma recurrence can be connected with incomplete excision in the biopsy. Bonawentura, who analysed 13 cases of benign papilloma which were followed-up, reports two cases of recurrence after 22 and 26 months. Imaging examinations revealed lesions similar to the ones found before the biopsy and with the same location (4). These observations support the necessity of periodical follow-up following lesion excision in core biopsy.

The appropriate assessment of the biopsy specimen requires sufficient quantity of tissue. In the study presented, the 10G and 11G needles were used. In the authors' opinion, such diameters of biopsy needles are adequate for obtaining sufficient quantity of tissue. Undoubtedly, what is vital for the accuracy of the mammotome biopsy result is an adequate experience of the physician who performs the biopsy (4).

The only complication in our study was a haematoma at the biopsy site, which occurred in three patients (4.8%). In no case was surgical intervention required, which proves that MB is a safe modality, well tolerated by patients (23, 24).

CONCLUSIONS

Mammotome biopsy is a minimally invasive and efficient modality which can be successfully used in diagnosing intraductal papilloma of the breast. In the authors' opinion, if a lesion is benign and the clinical picture is consistent, surgery can be abandoned provided that patients are regularly followed-up. On the other hand, if histopathological examination reveals papilloma with signs of atypical hyperplasia or gives rise to a suspicion of malignancy, open surgical biopsy is indicated in all cases.

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