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Surgery for minimal breast cancer

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INTRODUCTION

Breast is the symbol of sexuality and motherhood. Unfortunately, it is the target of the most frequent malignant tumor in women. Breast cancer surgeon has the key role in prevention, early detection, treatment, and quality of life for patients with breast cancer.

One million women get breast cancer every year. The incidence in the USA is 100/100.000 and in Europe 46-73/100.000. The higher incidence is registered in developed countries. There are 3.500 to 4.000 new cases of breast cancer in Serbia every year. In central Serbia, there was 2759 new cases and 1015 deaths of breast cancer registered in year 2002 (1). The similar incidence is registered in Balkan countries.

Thirty percent of women in developed countries have cancer *in situ* and another 30% have tumor less than 2 cm in diameter at the time of diagnosis. Furthermore, almost 80% does not have lymph node metastases. The situation in developing countries is much worse. Only 1% of cancer *in situ* and about 10% of tumors less than 2 cm in diameter at the time of diagnosis. About 80% does not have lymph node metastases.

The answer to this problem should be search in insufficient screening programs, and education of doctors and population itself.

DIAGNOSTIC SURGERY FOR BREAST CANCER

Indications

In era of mass breast cancer screening, diagnostic surgery and breast cancer surgeon are the key stone in obtaining specimens for histopathology examination of non-palpable but mammography visible breast lesions, as well as palpable suspicious lesions not seen on mammography or ultrasonography (2).

Diagnostic surgery has two goals:

- To remove suspicious lesions
- To preserve breast symmetry

Explorative surgery for non-palpable lesions

Microcalcifications have become a synonym for non-palpable breast lesions. But, not all microcalcifications are suspicious as malignant. Mrs. Le Gal from Curie Institute has defined five types of microcalcifications and ranges them

according to risk of breast cancer (3) (Table 1).

Table 1. Types of microcalcifications

Type of microcalcifications	Incidence of cancer
Type 1: sediment like	0%
Type 2: round and regular	22%
Type 3: dusty	36%
Type 4: polymorph	56%
Type 5: vermicular	91%

The operation is most commonly performed in cases of suspected, proliferative dysplasia (plaque), Paget's disease, or nipple secretion.

Considering non-palpable lesions a preoperative locating is performed. It usually done on computed stereotactic mammographs using a special wire to hook the lesion. Immediately the patient is sent to operating theatre where surgeon removes a small portion of breast tissue around the hook and send it to specimen mammography in order to confirm that he has removed microcalcifications described on mammography. In cases of residual lesion in the breast, the excision is repeated (Figure 1A,B).

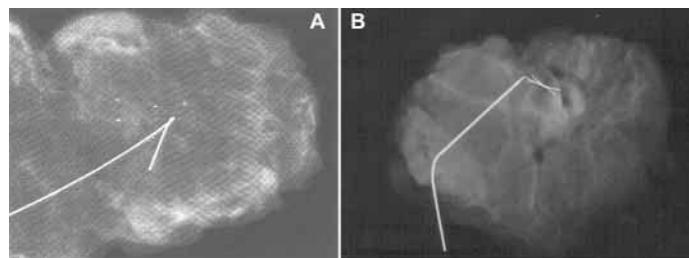


Figure 1 A,B. Specimen mammography for microcalcifications

After the confirmation by radiologist, the specimen is frozen-section examined. There is an approximately 30% of false negative findings on frozen-section so some authors suggest to wait for definitive histopathology. Definitive surgery is planned according to pathology report and patients decision. Breast conserving surgery and sentinel node biopsy is usually performed. In some cases mastectomy with or without primary reconstruction is indicated.

ROLL (radio-guided occult lesion locating) technique enable detection of non-palpable lesions by intraoperative detecting of radio colloid ("hot spot") applied preoperatively by ultrasound guided injection. The technique is based on same principles of sentinel lymph node mapping. In cases of diffuse microcalcifications, locating is not necessary. Skin incision is placed inframammary, whole breast is explored from pectoral plane, and tissue samples are taken and sent to histopathology examination.

In situ cancer is potentially curable at the time of diagnosis. Mastectomy could cure almost all of patients, but for majority of them could be an "over-treatment". Still, inadequate treatment carries a risk of invasive breast cancer. Lobular cancer *in situ* (LCIS) could be cured with surgery alone, but the extent of operation goes from biopsy to bilateral mastectomies, considering the multifocal appearance. Actually, there is no consensus about the best approach for *in situ* cancer.

Ductal cancer *in situ* (DCIS) precedes invasive cancer. Therapeutic dilemmas:

- Mastectomy provides curability in 100% of cases - "over-treatment"?
- Incidence of local relapse is 5-60% - which one is more probable?
- Risk depends on size of DCIS, extent of surgery, free margins, histology subtype,
- Breast conserving surgery (BCS) followed with postoperative radiotherapy should provide the same outcome as mastectomy.

Algorithm of management of ductal carcinoma *in situ* is schematically shown (Figure 2).

Global breast exploration

The surgical exploration in cases of proliferative dysplastic zones in the breast is sometimes suggested to the patient with positive family history for breast

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cancer or positive BRCA genes, fear of malignant tumor, atypical cytology findings or multiple fibroadenomas. In such cases on patients decision global breast exploration and biopsies of suspecting zones is performed via inframammary incision (Figure 3).

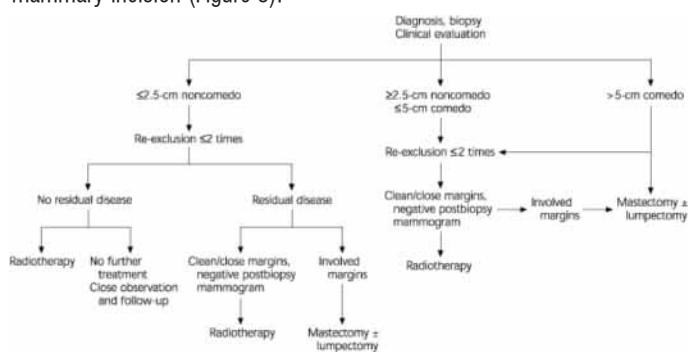


Figure 2. Management of ductal carcinoma *in situ* (Reprinted from Levitt SH. Radiotherapy for breast cancer. In: Kavanagh JJ, Singletary SE, Einhorn N, DePetrillo AD, eds. Breast cancer. Malden, Mass.: Blackwell Science; 1999. p. 106.)



Figure 3. Inframammary incision

Excision biopsy for nipple secretion

The operation is indicated in cases of nipple secretion with atypical cytology findings, ductectasia, intraductal papilloma with blood secretion. The approach is periareolar and dissection of critical duct is performed towards pectoral fascia. The specimen is routinely examined on frozen-section (4) (Figures 4 A,B).

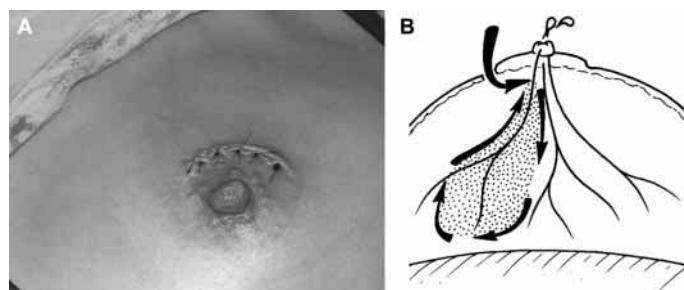


Figure 4 A,B. Paraareolar incision

Palpable tumor

Diagnostic surgery of palpable tumor comprises lumpectomy for frozen-section examination to obtain data of cancer size, type, extension, and free margins. Surgeon - pathologist intraoperative consultation are crucial in decision of type of operation. Type of lumpectomy is dictated by tumor location.

Excision biopsy of suspecting breast tumor

Skin incision is usually placed above the tumor, but it could be done as paraareolar or inframammary incision. If there is a skin impression excision is recommended. The glandular tissue should be cut vertically towards deep breast fascia with the minimal free margins of 1 centimeter. The tissue specimen is oriented and sent to frozen-section examination. Tumor size and free margins are analyzed by pathologist. In cases of close margins re-excision should be done.

New technologies

Mammotom - is a new computerized machine, which enables sampling of non-palpable breast lesions guided by ultrasonography under local anesthesia. Mammary ductoscopy is new endoscopic method, which enables visualization of intraductal pre-malignant and malignant tumors using fiber-optic equipment (5).

Breast conserving surgery (BCS) for early breast cancer

Mastectomy is no longer a synonym for breast cancer surgery. Early diagnosis and advantages of neo-adjuvant chemotherapy and postoperative radiotherapy enabled breast-conserving surgery for breast cancer less than 25 mm in diameter (6,7).

Types of operation

- Lumpectomy/quadrantectomy with axillary node dissection (level I and II)
- Lumpectomy/quadrantectomy with sentinel lymph node biopsy - SLNB (dissection if positive)
- Lumpectomy with SLNB and intraoperative radiotherapy (ELIOT) (8).

After partial breast removal a good esthetic results could be achieved with intra-glandular flaps so a plastic surgeon is an important member of multidisciplinary team (9) (Figure 5 A,B,C).

Sentinel lymph node biopsy has become a routine procedure in specialized centers (10). In cases of negative SLN, axillary dissection could be avoided as well the consequent morbidity. Of course, if the SLN carries metastases immediate dissection is indicated.

The results of some randomized follow-up studies of relapse rate and survival of patients without axillary dissection if SLN were negative, are expecting this year (Table 2).

Table 2. On-going randomized studies of patients without axillary dissection if SCN were negative

Trial	Begin	Inclusions	No pts	Method
Milan	1998	2 years	516	Isotopic
NSABP B32	1999	4 years	4000	Blue and isotope
ACOSOG Z0010	1999	3 years	5300	Blue and isotope
ALMANAC	1999	2 years	1260	Blue and isotope

Indications for BCS:

- Solitary tumor (T1, possibly to 3 cm in diameter in big breast)
- Independent to cancer type or location in the breast
- Clinically NO or N1
- Patients decision

Contraindications for BCS:

Absolute

- Two or more tumors
- Synchronous suspecting microcalcifications
- Preoperative radiotherapy
- Pregnancy
- Impossible to obtain „free“ margins

Relative

- Collagenosis
- Vascular diseases
- Tumor size

Table 3. Prospective randomized studies of outcome of BCS plus RT vs mastectomy

Trial	Endpoint (years)	BCS & RT	Mastectomy	(P value)
Milan Cancer Institute Trial (n = 701)	18	65	65	(NS)
Institut Gustave-Roussy (n = 179)	15	73	65	(0.19)
NSABP B-06 (n = 1,843)	12	63	59	(0.12)
National Cancer Institute (n = 237)	10	77	75	(0.89)
EORTC (n = 903)	8	54	61	(NS)
Danish Breast Cancer Group (n = 905)	6	79	82	(NS)

Adapted from Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. CA Cancer J Clin 1998;48:85.

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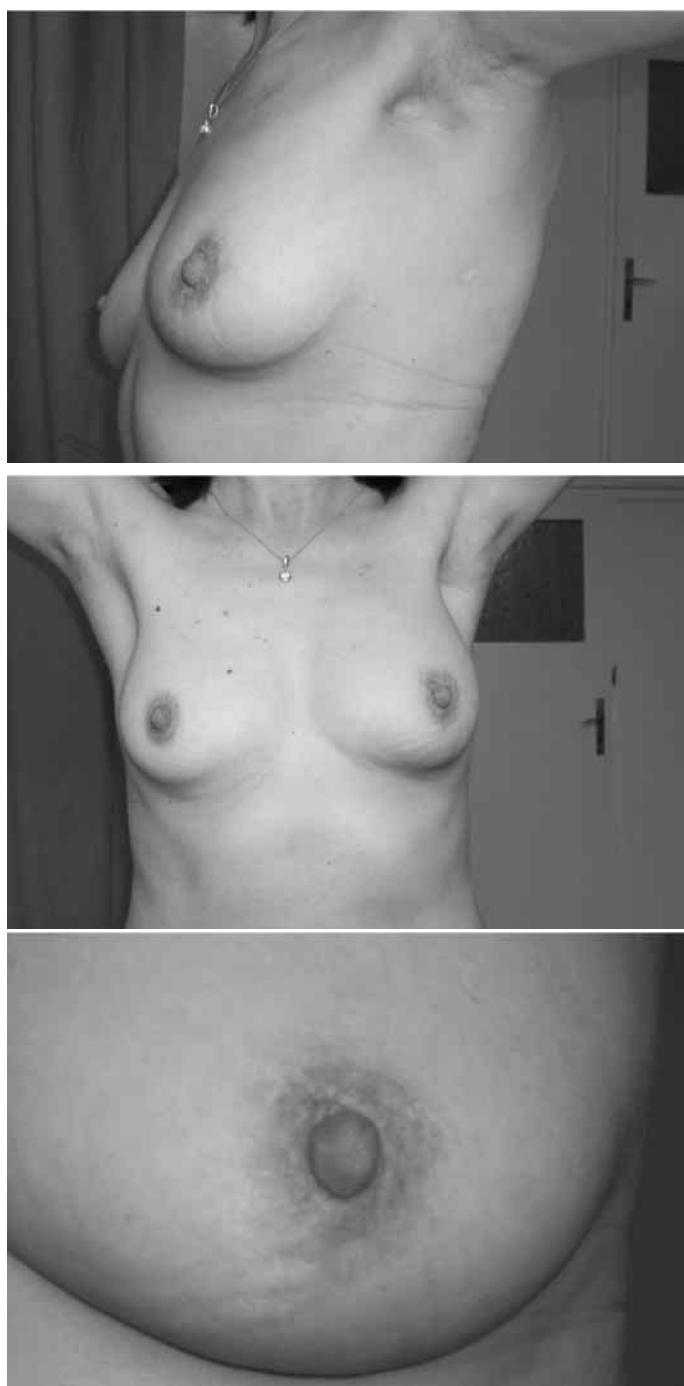


Figure 5 A,B,C. Good cosmetic and functional results of BCS via inframammary and axillary incision

In cases when BCS is contraindicated mastectomy with immediate breast reconstruction should be considered.

BCS - psychological aspects and outcome

Patients' wish is always crucial in decision of operation type. Women with preserved breast have significantly less depression, anxiety, insomnia, and fear of relapse and death (11,12).

Randomized studies have shown a higher incidence of local relapse in patients not receiving a postoperative radiotherapy after BCS (13).

Many prospective randomized clinical trials have shown no difference in survival of patients treated with BCS plus radiotherapy in comparison to those treated with mastectomy for early breast cancer (Table 3).