Surgery for minimal breast cancer

KEYWORDS: Breast Neoplasms; Diagnosis; Surgery; Surgical Procedures, Operative

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 2,759 new cases and 1,015 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 tumors 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>
<thead>
<tr>
<th>Type of microcalcifications</th>
<th>Incidence of cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1: sediment like</td>
<td>0%</td>
</tr>
<tr>
<td>Type 2: round and regular</td>
<td>22%</td>
</tr>
<tr>
<td>Type 3: dusty</td>
<td>36%</td>
</tr>
<tr>
<td>Type 4: polymorph</td>
<td>56%</td>
</tr>
<tr>
<td>Type 5: vermicular</td>
<td>91%</td>
</tr>
</tbody>
</table>

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 were 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).

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...
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).

Excision biopsy of suspecting breast tumor
Skin incision is usually placed above the tumor, but it could be done as paraareolar or inframammary incision. It 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 sends 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).

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 caries 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).

Indications for BCS:
- Solitaire tumor (T1, possibly to 3 cm in diameter in big breast)
- Independent to cancer type or location in the breast
- Clinically N0 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
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).

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

<table>
<thead>
<tr>
<th>Trial</th>
<th>Endpoint (years)</th>
<th>BCS &amp; RT</th>
<th>Mastectomy</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milan Cancer Institute Trial (n = 701)</td>
<td>18</td>
<td>65</td>
<td>65</td>
<td>(NS)</td>
</tr>
<tr>
<td>Institut Gustave-Roussy (n = 179)</td>
<td>15</td>
<td>73</td>
<td>65</td>
<td>(0.19)</td>
</tr>
<tr>
<td>NSABP B-36 (n = 1,843)</td>
<td>12</td>
<td>63</td>
<td>59</td>
<td>(0.12)</td>
</tr>
<tr>
<td>National Cancer Institute (n = 237)</td>
<td>10</td>
<td>77</td>
<td>75</td>
<td>(0.89)</td>
</tr>
<tr>
<td>EORTC (n = 900)</td>
<td>8</td>
<td>54</td>
<td>61</td>
<td>(NS)</td>
</tr>
<tr>
<td>Danish Breast Cancer Group (n = 905)</td>
<td>6</td>
<td>79</td>
<td>82</td>
<td>(NS)</td>
</tr>
</tbody>
</table>

Adapted from Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. CA Cancer J Clin 1986;46:65.

**REFERENCES**


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

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