

CRITERIA AND PROCEDURES FOR BREAST CONSERVING SURGERY

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ABSTRACT

Aim: Emphasizing circumstances that determine increasingly popular surgical approach of breast conserving surgery (BCS), used in lower grade breast tumors, while maintaining survival that is found when more radical procedures are used. **Patients and methods:** Several leading oncological protocols in the world are compared, using PubMed database, and our own experience. Data gathered are compared to conclusions of Consensus Con-

ference on Breast Conservation [Milan, 2005]. Furthermore, surgical contraindications found in our everyday work are considered, having in mind satisfactory cosmetic outcome, as well as keeping the 1 cm border of "clear" edges. Such more practical problems of edge detection can compromise BCS results. **Results:** After observing several relevant protocols, we found very high frequency of mastectomy vs. BCS, despite the fact that stage of disease was low. We also found only 20% of absolute contraindications for BCS. Most frequent con-

traindication for BCS was multicentricity of the tumor (with micro calcifications), especially in ductal in situ carcinoma. **Conclusion:** BCS followed by radiation therapy with tumor-free edges is standard procedure in treatment of T1 and small T2 breast cancers. This approach implies higher risk of local recurrence (LR), although local recurrence is low (1% per year), with rates of survival similar to radical procedures.

Key words: breast conserving, surgery, mastectomy, medical contraindication.

1. INTRODUCTION

Breast conserving surgery (BCS) with radiation therapy is today standard therapy for low grade Breast Cancer. It is safe and preferred therapeutic procedure in all early detected breast cancers, because it provides the same level of overall survival as mastectomy. Same survival rates as seen in patients treated with mastectomy, have been found by several prospective and randomized studies and number of clinical trials (1).

Besides that, BCS provides much better cosmetic effect, compared to radical treatments, a significant gain for patients, if tumors of grade I and II are considered.

International consensus conference about BCS (Milan, 2005) defines as: "... complete removal of the breast tissue with a concentric margin of surrounding healthy tissue performed in a cosmetically acceptable manner (lumpectomy) usually followed by radiation therapy" (2).

It should be noted that patients treated with BCS for cancer carry some higher risk of local recurrence of breast cancer for life (3).

Number of conditions must be fulfilled to treat a breast cancer with BCS.

There are number of factors that favor BCS:

- Smaller, monocentric tumors;
- Younger age;
- Treatment carried in specialised institutions;
- Favorable physical factors;
- Localization of tumor;
- Patient compliance.

Besides that, accomplishing a good cosmetic effect is of key importance when using BCS, balanced with width of excision, and achieving low local recurrence rate. These basic questions are in front of each breast surgeon, and to some extent to pathologist (4). Local recurrence is not in correspondence with regional and visceral secondary metastatic disease, but it does

not work in favor of BCS. Having in mind that number of malignant breast cancer cells at periphery of the tumor decreases progressively as we go further away from the edges, the crucial question is: how much tissue should be removed, to avoid local recurrence (LR)?

The goal of BCT should be a 10-year local recurrence rate less than 1% of LR (5).

Absolute contraindications for BCA (6):

- Locally widespread disease;
- Multicentricity;
- Diffuse (malignant) micro calcifications;
- I or II trimester;
- Patients with mutations on BRCA 1 and 2 genes;
- Already irradiated thoracic wall.

Since ductal carcinoma in situ (DCIS) usually presents diffuse micro calcifications, it is very hard to achieve clean excision edges, despite "en block" incision, including micro calcifications. Therefore it is

advised to mark a tumor with two wires, and after removal, control mammography should be done.

Bifocal tumors presentation gives rise to dilemmas: is it a case for radical or BCT?

It is possible to try to perform BCS if the tumors can be removed with negative edges, and volume of the breast is satisfactory from cosmetic standpoint. Tumors should be in same quadrant!

Due to higher LR rate, patients with BRCA 1 and 2 mutations, do have significantly higher risk of secondary disease after the irradiation. Despite inconsistencies in such reports, such patients can be candidates for BCS, but they have to be fully aware of the risk of new cancer.

- Relative contraindications for BCS;
- Invasive lobular carcinoma (ILC);
- Lobular carcinoma in situ (LCIS);
- Positive family history (“burden”);
- Collagen sclerodermia and LE (not RA) –due to poor irradiation tolerance.

Paget disease was also considered as contraindication, but today we perform central segmentectomy with reconstruction of nipple and areola, after irradiation.

Local disease is treated as objective “threat” to BCA, as mammography and sonography can be non-specific, such as enlargement of glandular tissue, and due to potential contralateral presentation of the primary tumor. Nevertheless, there are several studies that confirm ILC and LCIS can be treated with BCS successfully.

It is known that coexisting lobular caners and infiltrating tumors increase risk for new primary malignancy in breast.

2. EDGES OF EXCISED TISSUE

Despite the fact that there is no common definition of optimal edges – tumor free margin, it is common, even after consensus of Milan, that edge is 1 cm wide if possible, with possibility that postoperative irradiation can destroy microscopic remains of disease.

3. TYPES OF SURGICAL EDGES

- Positive edges – tumor cells are

present at the edge;

- Focal presence of tumor cells – at least three fields of view at low enlargement tumor cells are visible or are at the edge;
- More than focal presence – tumor cells are present in more than three fields of view at low enlargement;
- Narrow edges – tumor cells are 1/2 mm from edges;
- Negative edges – there are no tumor cells or the distance between edges and tumor cells is more than 1 mm.

Basic question for each surgeon is: how much healthy tissue should be removed to achieve clean edges, since positive edges are usually “frontline” of LR, and axillar and remote metastatic disease (7)?

Answer lies in direct dependency of size and histology characteristics of tumor, and methods of preoperative tumor detection, and surgeon experience.

So the main reasons of an failure in tumor edges detection are:

- Inappropriate excision of breast issue;
- Random specimen for biopsy;
- Discontinuous tumor cells expansion from the primary seat.

To avoid these failure Veronessi and al. 1991. proposed the use of monoclonal antibodies in tracking down carcinoma cells on specimen surface.

4. COMMENTS

Globally acceptable basic oncological priority:

Maximize disease control and satisfactory cosmetic outcome.

To fulfil this demand, there is a rigorous selection of candidates for BCT. Beside complete anamnesis and clinical examination the most important rule has preoperative imaging diagnostic including MRI (9). In the establishment of the International Consensus on BCT basic pattern gave American College of Radiology (ACR), American College of Surgeons (ACS), College of American Pathologists (CAP) and Society of Surgical Oncology (SSO)(10).

In the mean time there was a lot of problems in margins classifica-

tion, specially in positive margin unique definition! These definitions went from «positive edges are only tumor cells on colored specimen surface» until «only if tumor cells founded inside 5 mm colored area».

These renounces in margin classifications are usually result of previously mentioned mistakes in specimen biopsy among individuals and institutions with different margin evaluations (11).

Some sources mentioned failure in biopsy of few samples that interfere margin evaluation.

It is also difficult to define a real edge from fatty, too big and rough sample surface. Today there is a strong believe that extensive intraductal components (EIC) is potent marker for patients with diffuse microscopic carcinoma taint. EIC is also significant predictor of local recurrence, specially for positive edge tumors. Consequently, in many publications local recurrence higher incidence correspond to increase ratio of EIC-positive tumors.

In all studies the highest local re-occurrence rate correspond to «more than focally positive margins» and lowest local recurrences rate to «negative margin tumors».

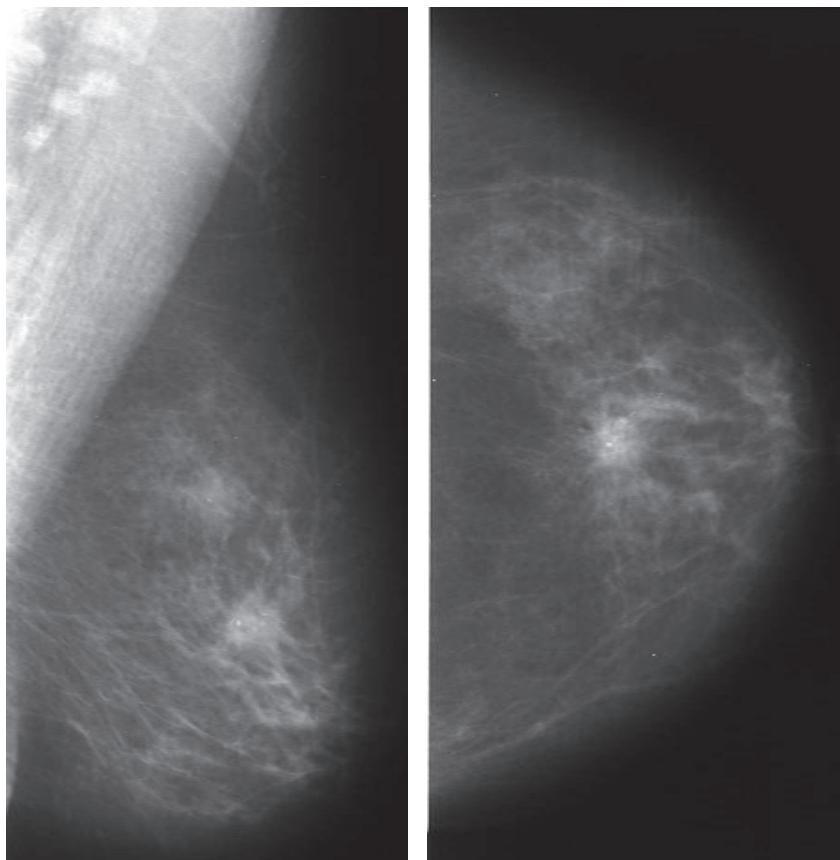
There are also data about the highest BTC contraindication rate (more than 40%) for multi focal tumors including DCIS.

Comparing different BCT methods there is interesting data from Milan Study. There was no difference in overall survival during seven years among quadrantectomy vs. lumpectomy followed by radiation therapy patients (1).

One study from 1995 present 5% of local recurrence followed quadrantectomy (12). Among many open issues followed BCT literature emphasize systematic spread of breast cancer. So, the main predictors of systematic spread (recidivus) are:

- Unilateral (ipsolateral);
- Positive edge;
- Tumor size (more than 2 cm.);
- Positive lymph nodes;
- Young age.

Ipsolateral breast tumor recidivus (IBTR) along with positive edges is the main predictor of tumor sys-



Slika 1. Mamografija - standardne projekcije: mediolateralna kosa (MLO) i kraniokaudalna (CC)

tematic spread (13). Consequently the most significant surgeon aim is to provide wide negative surgical margin to minimize risk of local recurrence.

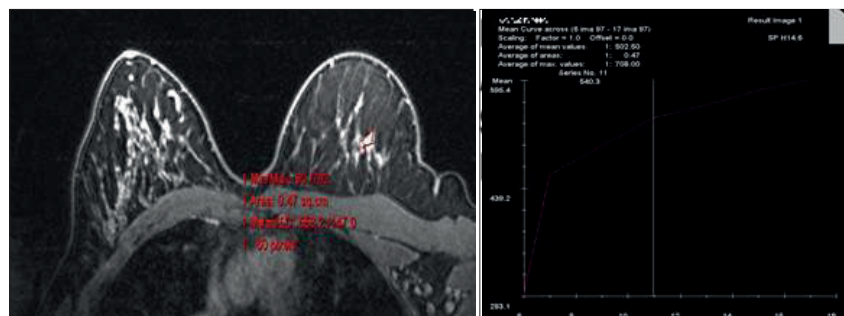
Dilemma (if exists) of how to treat “*in breast recidivus*” is resolved in Milan Consensus: *Mastectomy with or without reconstruction !!!*

Also, in matter of axillary recidivus after SLNB complete axillary dissection is strongly recommended. It is also recommended to perform oncoplastic surgical breast-reshaping techniques at the time of initial surgical excision because of poor cosmetic outcome after radiation therapy.

One of the most important conclusions from Milan Consensus is that width of the clear surgical margin after local excision of the primary tumor should be between 1-10 mm.

Very important conclusion is that DCIS inside of the primary lesion is not contraindication for BCT!

Despite all strong arguments for BCT, according to American College of Surgeons (ACS) (identical overall survival) only 15 years ago,



Slika 2. Magnetna rezonancija dojki: poslijekontrastni dinami ki prikaz u T1 mjerenom vremenu sa supresijom signala masti i prikazom normalne kineti ke krivulje zdravog parenhima

more than 50% of all patients with early stages breast cancer was surgically treated by Mastectomy (14, 15).

So there is a question: how much medical contraindication influence on decision about surgical method and how much patients wish for good cosmetic outcome?

There are arguments for mastectomy:

- Lower recurrence rate;
- Without irradiation therapy (IR);
- Without other surgery.

Arguments for BCT are:

- Cosmetic effects-minimal scar;
- Avoid reconstructions and prothesis;
- Minimal breast issue excision.

In majority of protocols older age is connected with higher mastectomy rate. Despite to growth of BC procedures for low grade breast cancers in last three decades, according to literature these procedures in USA include in total 10-45% of patients (16, 17), in some BCT protocols even 73% (18). According to prospective study (19) analysis was performed in 432 women with stage 1 and 2 breast cancer. Group for BCT was selected by ACS, ACR, ACP and SSO criteria. All patients from this group had an option to be operated by:

- BCT;
- Radically;
- Radically with immediately reconstruction.

The great percentage of contraindications for BCT was in group of patients with DCIS (33%). No matter of race and age 81% of patients wanted BCT option. Some other studies showed that in BCT ratio influenced geographical origin (20, 21), patients age (22, 23) and carcinoma stage.

It is well known that final success of BCT depends not only on technical but also a well known biological factors:

- Tumor size;
- Lobular and ductal structure;
- Extensive and ductal components (EIC).

5. CONCLUSION

In selecting patients for BCT there is no strictly limitation in view of tumor size if the primary tumor can be excised adequately with clear margins and acceptable cosmetic outcome. However, the majority of women with T1 and small T2 cancers are currently considered as suitable candidates for breast conservation.

If these criteria are followed BCT become international reference standard for treatment of T1 and small T2 Breast cancers.

Analyzing a few relevant studies we concluded that only 20% of operated women had absolute contraindications for BCT. In some domestic and international hospitals ratio of radical breast surgical procedures is still too high.

Therefore, it is valuable to remember Milan Consensus Conference 2005 recommendation:

“... to apply BCT for younger patients until a patient and doctor together accept higher risk.”

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