Radical mastectomy and immediate breast reconstruction using the Becker prosthesis

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Summary

Background

Radical mastectomy in breast cancer patients creates good conditions for effective oncological treatment, however the significant injury is a cause of psychological and social disorders, lack of self acceptance and can be a cause of postural deformation. Immediate breast reconstruction can prevent or reduce the unfavourable side-effects of amputation.

Aim

The aim of this paper was to present our own observations concerning immediate breast reconstruction after mastectomy for cancer.

Materials/Methods

In the period from 20.09.2000 to 19.09.2003 in the Oncological Surgery Department of the Leszno Hospital, mastectomy followed by immediate breast reconstruction was performed on 65 women in stages 0, I and II of the clinical advancement of breast cancer. Twenty three women were treated by surgery alone, 30 women were given pre or postoperative chemotherapy, 17 received hormone therapy and 6 were given postoperative radiotherapy. The time of post surgical follow-up was between 5 and 36 months.

Results

Of the 65 women treated 54 (83%) found the aesthetic results to be good or very good. In 3 cases (4.6%) the implant had to be removed owing to complications such as infections (2 cases) or local cancer recurrence (1 case).

A symmetry procedure (McKissock, Lejour or Benelli) was later performed on the opposite breast of thirty (46%) of the women.

Conclusions

In conclusion, immediate breast reconstruction using the Becker prosthesis is safe, well accepted and improves the quality of life for patients after oncological treatment.

Key words breast reconstruction • Becker prosthesis • skin sparing mastectomy


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**BACKGROUND**

More than 10,000 women in Poland develop breast cancer annually [1]. The standard method of treatment is surgery. In the cases of most women this means total removal of the breast and axillary lymph nodes. In a few cases (around 10%), treated in specialist oncology centres, attempts are made to operate with conservation of the breast (BCT – breast conserving therapy) which involves removal of the tumour with margins of healthy tissue, axillary lymph nodes and radiotherapy [2].

Radical amputation of the breast gives good conditions for effective oncological treatment though, in a significant number of cases, it is the cause of psychological disorders, a lack of self acceptance, difficulties with interpersonal contact and may lead to significant postural deformation through twisting of the spine [2–4].

For many years some women have been able to return to normal activities following radical breast surgery. Until now the majority of reconstructive surgery has been performed by plastic surgeons a few months or even years after breast amputation. This approach offered patients the chance to regain the natural look of their bodies after the conclusion of their oncological treatment. Developments from this stage of experience led to changes such that increasing numbers of women are being offered the possibility of having their breast cancer operation followed by immediate reconstructive surgery [5–7]. This approach allows a radical oncological amputation (with removal of the axillary lymph nodes) and reshaping of the breast during the same period of anaesthesia. Reconstruction may be achieved through reforming the patient’s own tissue into pedunculated lobes or by use of implants or by both methods together [2,5].

Decisions regarding the choice of oncological treatment and the method of breast reconstruction are made by a multi-disciplinary team in co-operation with the patient. Influencing factors include the stage of advancement of the tumour, the general state of the patient and their psychological condition as well as drips to be inserted after surgery. In no case may reconstructive breast surgery, after a radical amputation, limit planned oncological treatment.

**AIM**

The purpose of the study was to collate and present our experiences with immediate reconstructive breast surgery using the expanding Becker prosthesis in patients who have undergone breast amputation for cancer.

**MATERIALS AND METHODS**


Patients found to be, preoperatively, in stages I or II of the clinical advancement of breast cancer qualified for immediate reconstructive surgery with no exclusions regarding the type of operation. All the women gave their consent to radical surgery and reconstruction and declared their wish to take an active part in postoperative breast reformation and rehabilitation. Post surgical follow-up was between 5 and 36 months. Clinical and demographic analyses of the operated women can be found in Table 1.

**The Becker prosthesis**

The Becker Prosthesis consists of a double celled implant and a connecting 'port' system which is placed under the skin and allows for postoperative filling and shaping of the prosthesis. The outer cell of the implant is filled with a silicone solution and the inner cell is empty but may be filled.

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**Table 1. Demographic and clinical profile of operated women (n=65).**

| Age (years) | 44.5±10.99 (22–70) |
| Height (cm) | 163.3±6.58 (151–176) |
| Weight (kg) | 63.3±8.08 (51–79) |
| Hormonal status: |
| Menstruating | 38 |
| Menopausal | 27 |
| Number of prior pregnancies | 48 |
| Breast feeding | 31 |
| Education: |
| Basic | 17 |
| Intermediate | 30 |
| Higher | 18 |
| Size of tumour |
| Tis | 6 |
| T1 | 35 |
| T2 | 24 |
| T3 | 6 |
| T4 | 6 |
| Lymph node status |
| No | 38 |
| N1 (<2) | 21 |
| N1 (≥3) | 6 |
| Co-existing disease: |
| Heart disease | 12 |
| Hypertension | 17 |
| Obesity | 12 |
| Diabetes | 6 |
| Addicted to tobacco smoking | 21 |
postoperatively, with physiological saline solution. The ability to fill the inner cell of the prosthesis, and reshape tissue, postoperatively is an advantage of the Becker prosthesis over earlier prostheses [8–10].

Table 2. Contraindications to breast reconstruction using the Becker prosthesis.

- active inflammatory process, infections – regardless of cause
- current or recent purulent conditions of the breast area
- ongoing or recurring cancer of the breast
- planned radiotherapy within the oncological treatment scheme
- psychological illness or instability
- a lack of understanding of the idea of breast reconstruction and the need for breast reshaping
- pregnancy or ongoing breast-feeding
- uncontrolled diabetes
- lupus, scleroderma
- radiation damage to the rib cage, state of the pectoral muscles after resection

Figure 1. Thirty six year old woman with breast cancer (ca ductale invasivum, G2, pT1, pN1, Mo) 8 weeks after a skin sparing mastectomy with immediate breast reconstruction using the Becker 25–200cc prosthesis.

Figure 2. Number of operations by year.

Surgical procedure

After diagnosis of malignant disease and qualifying for surgery, each patient was informed of the possible treatments, among these the possibility of immediate breast reconstruction. Patients who expressed an interest in breast reconstruction using the Becker prosthesis were given details, prior to surgery, about the method and about potential problems and complications associated with the treatment.

In the absence of any contraindication (see Table 2) patients were prepared for surgery. The first (oncological) stage of the operation involves radical amputation of the breast tissue while conserving as much skin as possible (SSM – Skin Sparing Mastectomy) [11]. The skin specimen always included the nipple and areolar with intermediate skin covering the tumour which was localised earlier by diagnostic biopsy.

After removal of the breast and axillary lymph nodes and after achieving haemostasis, the reconstructive stage of the surgery begins. Under the pectoral muscles a spacious pocket is formed reaching to the sternum from around 2 cm below the subpectoral fold. After installation of the implant in this prepared space, it is covered completely by the muscles. The port is aligned below the axillary skin on the side wall of the rib cage.

During the operation the outer cell of the implant is partly filled with saline in order to assist with shaping of the breast. Immediately after shaping of the breast the nipple and areolar are reconstructed by the Maltese Cross method and twin pedunculated plates of skin scar from the amputation [2,12].

Results

The first SSM with immediate breast reconstruction using the Becker prosthesis was performed on a 36 year old patient on 20.09.2000 (Figure 1). From this time the number of similar procedures performed increased steadily (see Figure 2). Post operative staging of clinical advancement of disease was stage 0 in 6 patients (5 DCIS, 1 LCIS), stage I in 21 patients (T1 – ca ductale inv. 18; ca lobulare inv. 3), stage IIA in 28 and IIB in 10 patients (Figure 3). Analysis of the group shows that 23 patients were treated by surgery alone and 30 patients were given pre or postoperative...
chemotherapy. 6 patients were given postoperative radiotherapy as they were found to have neoplastic changes in the lymph nodes (≥3). 17 patients were given postoperative hormone therapy. After completion of oncological treatment and reshaping of the breast, symmetry operations were performed on 30 (46%) of the patients (16 – McKissock, 11 – Lejour, 3 – Benelli). During this postoperative period, an independent grading of the aesthetic effects of the treatment was carried out.

Postoperatively, 54 women (83%) said they found the aesthetic results of the surgery to be either good or very good. (See Figure 4).

The remaining 8 subjects were not entirely satisfied with the results of the surgery and in 3 patients it became necessary to remove the implant. In two patients the Becker prosthesis had to be removed because of infection (which culture showed to be Staphylococcus epidermitis) and in patient removal was owing to recurrence of the tumour and the need to irradiate the walls of the rib cage.

Two women from whom the implant was removed said they would like further surgery to reshape the breast. A few months after healing of the tissues and completion of oncological treatment they underwent reconstructive operations using their own tissue through use of plates of skin and muscle taken from the widest part of their backs (LD – Latissimus Dorsi). In both cases the results of the operation were good.

DISCUSSION

Immediate reconstruction of the breast after mastectomy for cancer is safe and is an increasingly accepted method of treatment. Up to the present time use of expandable prostheses has not been found to have any indirect effects on the course of malignant neoplastic disease [13]. Similarly, no issues regarding the use of silicone implants and increased incidence of autoimmune disease are known [14]. Clear guidance for safe usage of silicone prostheses is to be found in the EQUAM (European Committee on Quality Assurance and Medical Devices in Plastic Surgery) declarations of 2000 and 2002 [2,13,15].

The majority of women who underwent mastectomy and immediate breast reconstruction chose restructuring of the breast using the Becker prosthesis, as it is relatively simple, gives a little relief and does not greatly prolong the operation. The knowledge that further follow-up testing or even oncological surgery may be necessary prevented most women from opting for extensive reconstructive surgery using their own tissue [2,5,10,16].

Both the operated women and the treatment teams found the results to be good in terms of functionality and aesthetics, although the professionals’ assessments of the results were slightly lower than those of the patients themselves.

A good psychological state and the will to quickly return to a full and active life characterised the majority of the group of women who underwent immediate breast reconstruction. This is in agreement with the findings of other authors [2,5,17,18]. The first results of computerised photogrametry assessments of the operated women shows that immediate reconstruction using the Becker prosthesis somewhat reduces the postural problems found after conventional mastectomy [3,4]. It must be stressed, however, that use of the prosthesis may give rise to complications which may increase the number of corrective interventions – possibly even leading to removal of the implant. In the tested group of women, this was the case for 3 pa-
patients (4.6%), a result which does not deviate from those of other authors [5–7].

In order to achieve the best possible results for aesthetics and functionality and to limit the number of complications it is necessary to very strictly control which patients qualify for the surgery and to inform them, prior to surgery, of the full details of the procedure and about the potential problems. The full acceptance of the patient to whom the surgery is proposed is a basic condition for the reconstruction.

It is most important that reconstructive surgery should not lead to any situation which would have a negative effect on the process of oncological treatment. Performing a mastectomy with immediate reconstruction of the breast appears to have no effect on oncological treatment or breast reshaping. At every stage of the treatment the whole team worked closely together. An important and difficult problem was that of postoperative radiotherapy. In the cases of 6 patients the most recent histopathology results led to the decision to irradiate the retrosternal, supraclavicular and axillary areas. In observations 9–25 months after completion of the treatment, no complications were observed in this group of patients. However, in cases where the need for radiotherapy is forseen preoperatively, the best course of action is to delay reconstruction or to reconstruct using the patient’s own tissue [2,19–21].

Good teamwork and the agreement of the whole oncology group provides the basis for effective treatment and for good results.

**Conclusions**

1. Immediate reconstruction of the breast using the Becker prosthesis in patients who have undergone radical amputation of the breast because of cancer is a safe and well accepted method of treatment.

2. Proper selection of patients for immediate reconstruction after amputation is a basic element in the procedure, leading to reduced postoperative complications and an improvement to the quality of life of patients, after treatment.

3. Problem-free conditions at every stage of the treatment is a positive effect of full cooperation between the surgeons and the whole oncology team.

**References:**