

## Indications for and limits of conservative surgery in breast cancer

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**SUMMARY:** Indications for and limits of conservative surgery in breast cancer.

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*Improvements in diagnostic techniques and, above all, breast cancer screening campaigns - essential for early diagnosis - have enabled the objectives of conservative surgery to be pursued: disease control, no or low incidence of recurrences and an excellent esthetic re-*

*sult. However, to reach these objectives, it is essential to ensure a careful evaluation of the medical history of every patient, a detailed clinical examination and the correct interpretation of imaging. Particular attention should be paid to all factors influencing the choice of treatment and/or possible local recurrence: age, site, tumor volume, genetic predisposition, pregnancy, previous radiotherapy, pathological features, and surgical margins. The decision to undertake conservative treatment thus requires a multidisciplinary approach involving pathologists, surgeons and oncological radiologists, as well, of course, as the patient herself.*

KEY WORDS: Breast cancer - Conservative surgery - Quadrantectomy - Radiotherapy.

### Introduction

Conservative surgery for breast cancer is now a well consolidated practice, whose first literature descriptions date back as far as the 18<sup>th</sup> century. Henri Francois Le Dran (1) described cancer as a local disease which spreads through the lymph ducts to locoregional lymph nodes and further afield only at a later moment. This theory was embraced by numerous surgeons of the age, including Jean Louis Petit and, most importantly, James Paget (2), who stressed: i) the importance of hereditary factors in breast cancer; ii) the relationship between the severity of the disease and the patient's age; iii) the role of blood stream in spreading metastases.

Paget was convinced that surgery was useless in advanced stages of the disease. In contrast, other authors, including Charles Moore in 1867 (3), suggested that re-

currence depended on incomplete surgical removal of the tumor, thus advocating that surgery should be as radical as possible.

This was the background for the development and popularity of the procedure proposed by William Stewart Halsted (4), inspired by a legitimate desire for radicalism. He believed that the effective treatment of cancer required a procedure which was undoubtedly mutilating, but necessary to stop its spread.

Since then, technological progress has enabled the identification of ever smaller tumors. This has led to a different therapeutic approach with ever less frequent recourse to mutilating surgery (5, 6), with all surgical schools now preferring conservative techniques (7, 8).

### Caseload

Between 2003-2008, we treated 664 cases of breast cancer in patients aged between 24 and 82 years, of whom only two were male. Preoperative investigations in 431 patients (64.9%) led to the diagnosis of small tumors, with the exclusion of multifocal disease. 214 of these (49.7%) were staged as T1a or T1b, 169 (39.2%) as T1c and the remaining 48 (11.1%) as T2. After careful US localization, all these patients underwent conservative surgery, involving tumorectomy for stages T1a and T1b and quadrantectomy for stages T1c and T2. In all cases, the margin was extended by at least 2 cm from the

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limits of the tumor and down to the pectoralis major fascia, which was systematically removed. Data on the sentinel lymph node are not included, as it was not studied in all cases and the data are therefore not significant.

In 398 cases (92.3%), ipsilateral axillary lymphadenectomy was also performed. Drainage tube was positioned in all cases. Histological examination led to the diagnosis of infiltrating duct carcinoma in 323 cases (74.9%), infiltrating lobular carcinoma in 91 (21.1%), medullary carcinoma in 9 (2.1%) and mucinous carcinoma in 8 cases (1.9%). The margins were completely infiltration-free for at least 1 cm. Lymph node examination revealed micrometastases in 107 patients (26.9%), with clear invasion in all others.

To date, we have recorded 15 cases of recurrence (3.5%), all early onset (between 14 months and 3 years). These patients were all premenopausal and aged between 31 and 48 years. Specifically:

- 9 cases (2 stage T1a or T1b, 5 stage T1c and 2 stage T2) involved the appearance of a small nodule in the same quadrant as originally treated, the early diagnosis of which during follow-up enabled further conservative treatment;
- 4 patients (1 stage T1b, 1 stage T1c and 2 stage T2) presented numerous nodules, requiring radical mastectomy;
- 2 patients (1 stage T1c and the other stage T2), both with positive lymph nodes, developed carcinomatous mastitis, not brought under control with complementary treatments, resulting in death within 6 and 8 months respectively (Table 1).

## Discussion

In recent decades, improvements in diagnostic techniques and implementation of screening campaigns for breast cancer, which are essential for early diagnosis, have enabled the objectives of conservative surgery - control of the disease, no or low incidence of recurrences and an excellent esthetic result - to be pursued without any loss of radicalism (9). All oncological surgeons are thus oriented towards conservative treatments, where specifically indicated. A careful assessment must be made of a series of factors, some concerning the patient's medical history, others the characteristics of the mammary gland and the tumor itself. The opinion of the duly informed patients must also be taken into account (10, 11).

### A - Factors concerning medical history

*Age.* Even today, it is difficult to establish the exact influence of age on the outcome after conservative surgery, especially in the young (< 35 years). This may be due to different study procedures, the heterogeneity of the caseloads and, above all, how "young age" is defined (12, 13). In fact, some studies in the literature report the greatest number of local recurrences and/or lowest survival in young patients undergoing conservative surgery, while others have found no such correlation (14). In any case, other factors affecting the long-term outcome of these patients should always be borne in mind. These include incomplete excision, any extensive intraductal component, negativity of estrogen receptors and high histological stage. These are the real culprits behind a higher local recurrence rate and must be carefully evalua-

ted before proposing conservative surgery. In such cases, the option of offering nonsurgical treatment should also be considered (15-19).

*Family history and genetic predisposition.* A family history of breast cancer is not an absolute contraindication to conservative surgery (20). However, such patients have a higher risk of developing breast cancer, especially if they also have BRCA1 and BRCA2 gene mutations (55-85% probability of developing cancer, often bilateral, before the age of 70 years). In addition, as reported by Haffy et al., local recurrence is significantly more common in patients with genetic mutations undergoing conservative surgery for breast cancer than in women with sporadic cancer (21, 22).

*Pregnancy.* Not only is conservative surgery possible in pregnancy, but it is a perfectly safe therapeutic option if carried out in the second trimester, enabling radiotherapy to be postponed until after the birth, due to the risk of fetal radiotoxicity (23, 24).

*Collagen diseases.* These can cause severe complications during radiotherapy after conservative surgery. Chen et al. reported a greater incidence of complications and recurrences in a group of patients with a collagen disease, specifically in a subgroup with scleroderma (25).

*Previous radiotherapy of the chest wall.* Where additional radiotherapy cycles are expected after conservative treatment, excessive radiation could induce not only toxicity but also damage severe enough to cause breast disfigurement (26). In such patients, radical mastectomy is indicated.

### B - Factors concerning the characteristics of the mammary gland and tumor

*Location.* Careful choice of the site and extension of the skin incision is essential to achieve surgical radicalism, limit the risk of recurrence and obtain the best esthetic results. With cancers in the outer quadrants, a radial incision should be used, enabling the ample excision of the breast tissue surrounding the tumor and removal of the underlying muscle fascia. For cancers in the upper outer quadrant, this incision also enables axillary dissection. For the inner quadrants, a radial incision or, especially in the lower inner quadrant, an upside-down T incision may be useful. In these cases, the need to carry out axillary lymph node dissection requires a double incision. Finally, for central or sub/peri-areolar carcinomas, a peri-areolar incision should be used. However, this can lead to ditching of the areola or nipple, especially in small breasts (27, 28).

*Tumor size.* If complete excision is achieved, there should not be any correlation between tumor size and the risk of local recurrence. Conservative surgery is known to offer high success rates in the control of stage T1 and T2 cancers. For large tumors, especially those above 5 cm, the same guarantees cannot be offered. Moreover, especially in the case of small breasts, not only the long-

TABLE 1 - CASELOAD: PATIENTS (TOTAL 431) WITH SMALL TUMOUR AND PREOPERATIVE EXCLUSION OF MULTIFOCAL DISEASE.

No. cases	%	Stage	Surgical procedure	Results	
214	49.7	T1a and T1b	Tumorectomy	Cure	211
				Recurrence (single nodule)	2
				Recurrence involving numerous nodules	1
169	9.2	T1c	Quadrantectomy	Cure	161
				Recurrence (single nodule)	5
				Recurrence (multiple nodules)	1
				Carcinomatous mastitis	1
48	11.1	T2	Quadrantectomy	Cure	44
				Recurrence (single nodule)	2
				Recurrence (multiple nodules)	2
				Carcinomatous mastitis	1

term outcome but also the risk of a poor esthetic result should be taken into consideration (29-31). With large tumors and/or a disadvantageous breast tumor volume ratio, the possibility of an esthetic result not matching the patient's expectations as well as recurrence of disease should be carefully assessed, especially after neoadjuvant therapy.

**Pathological features.** Histotype and grading, any tumor necrosis, vascular and/or lymphatic invasion and lymph node status, although having a solely predictive value and therefore not totally contraindicating the use of conservative surgery, should be borne in mind when assessing the possibility of local recurrence (32, 33).

**Infiltrating lobular carcinoma.** This histotype is often associated with a high percentage of multicentric disease. This is not associated with an increase in local recurrence so does not totally contraindicate conservative surgery, but it does indicate the need to enlarge the excision, more than for other histotypes, to ensure negative margins (34, 35).

**Extensive intraductal component.** In cases with an intraductal component of more than 25% of the tumor volume, a high local recurrence rate should be expected after conservative surgery (36). In these patients too, broad negative margins are necessary to ensure adequate local control of the disease (37).

**Multicentric and multifocal disease.** These conditions seem to be predisposing factors for recurrence, found in 25-40% of patients treated with conservative surgery. Careful preoperative assessment using accurate mapping is essential to establish the existence of multicentric cancer, an absolute contraindication to conservative treatment. Patients with multifocal cancer can be treated conservatively, as long as the margins are negative, and a good esthetic result can be achieved (38-40).

**Negativity of the margins.** There is as yet no complete consensus on how much healthy tissue should be removed in order to reduce the risk of recurrence. In most cases, a margin with no cancer cells 2-3 mm from its edge under microscopic examination can be considered as negative. A positive margin is associated with a 2-3 times higher risk of local recurrence (41, 42).

### C - Patient expectations and preferences

Many studies have compared the quality of life and sex life of patients undergoing conservative surgery or mastectomy, finding no substantial differences between the two groups. Despite this, the diagnosis of cancer and the consequent mutilation of a breast is a traumatic event in the life of every woman and her family (43). Patients must therefore be informed, with due consideration of their character and psychological aspects, of the relative risks and benefits of conservative surgery and mastectomy, enabling them to contribute to the choice of treatment, where possible.

## Conclusions

Candidates for conservative treatment of breast cancer must have a single tumor with an adequate ratio between breast and tumor volume, facilitating the achievement of negative margins and an acceptable esthetic result. Conservative treatment is absolutely contraindicated in cases of multicentric disease, some collagen disorders, a history of previous radiotherapy of the chest wall and a predicted difficulty in obtaining negative margins.

The selection of candidates for conservative surgery requires the active participation of a multidisciplinary team including pathologists, surgeons and oncological

radiologists. The involvement of the patient in the decision-making process is also important, given that she is the one who has to face and accept the reality of a disease requiring both surgery and radio- and/or chemotherapy in order to ensure the best quality of life. Whe-

re this is not possible and radical surgery is necessary, it is to be hoped that every patient takes to heart a comment made by Patey in 1948: "Quality of life is very important, but it cannot be the only parameter by which results should be judged".

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