

Systematic cavity shaving: Modifications of breast cancer management and long-term local recurrence, a multicentre study

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Abstract

Background: The status of the surgical margins of lumpectomy is one of the most important determinants of local recurrence in breast cancer. Systematically practicing cavity margin resection is debated but may avoid surgical re-excision and allow the diagnosis of multifocality. **Methods:** This multicentric retrospective study included 294 patients who underwent conservative management of breast cancer with 2–4 systematic cavity shavings. Clinico-biological characteristics of the patients were collected in order to establish whether surgical management was modified by systematic cavity shaving. Local recurrence rate with a long-term follow up of minimum 4 years was evaluated. **Results:** Cavity shaving avoided the need for re-excision in 25% of cases and helped in the diagnosis of multifocality in 8% of cases. Resection volume was not associated with usefulness of the cavity shaving. No predictive factor of positive cavity shaving was found. The rate of local recurrence was 3.7% and appeared in a median time of 3 years and 8 month. Only one quarter of the patients with local recurrence had initially positive lumpectomy margins but negative cavity shaving.

Discussion: Systematic cavity shaving can change surgical management of conservative treatment. No specific target population for useful cavity shaving was found, such that we recommend utilising it systematically.

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Keywords: Breast cancer; Breast conservative surgery; Cavity shaving; Lumpectomy; Margin; Local recurrence

Interest in systematic cavity shaving

Systematic cavity shaving is a part of breast-conserving treatment. It helps to avoid re-excision and identify multicentricity. It appears to be a safe procedure; the local recurrence rate is equivalent to that described for classic lumpectomy.

Introduction

Breast cancer is the most frequent cancer observed in women in France. In 2010, 74% of breast cancer patients

underwent conservative breast cancer management in France.¹ Several randomised studies have shown equivalent survival rates between conservative management (i.e., lumpectomy and radiotherapy) and mastectomy.^{2,3} The most important risk factor of local recurrence in conservative management cases is margin status.^{4,5} The other risk factors for local recurrence after lumpectomy and radiotherapy are young patients, cancer size, positive oestrogen receptors, HER2 overexpression, histopathological grade, and high Ki67.^{6,7}

Conservative management has both oncologic and aesthetic challenges. The cancer excision must be complete with negative margins to decrease the risk of local recurrence. Surgical re-excision is needed when the margins are not free of cancer. Several techniques can help to decrease the rate of positive margins, including pre-

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operative targeting of the lesion with ultrasound or radiography, histopathological examination of the margins during surgery, and lumpectomy radiography during surgery. Some surgeons have introduced the concept of systematic cavity shaving at the time of primary breast-conserving surgery. Surgeons opposed to this procedure argue that the usefulness of cavity shaving depends on the surgical technique and resection volume. Systematic cavity shaving allows for a better analysis of the margins; all the separate cavity shavings are fixed in formalin and analysed.

In this study, we aimed to evaluate immediate interest in and the local recurrence rate of systematic cavity shaving breast-conserving surgery.

Materials and methods

A total of 294 patients who underwent breast-conserving surgery for cancer were included in this retrospective multicentric study between January 2003 and August 2008.

Surgical technique

Lumpectomies for in situ or invasive breast cancer were performed by trained surgeons in the gynaecology departments of 3 French teaching hospitals. Lumpectomy consisted of an excision extending from subcutis to the pectoral fascia. Therefore, neither anterior nor posterior additional cavity shavings were collected. At the same time, 2 to 4 separate systematic cavity shavings (superior, inferior, medial, and lateral) were collected from the wall of the residual cavity. Only 2 or 3 cavity shavings were collected when cancer was situated close to the breast glandular limit. All specimens were oriented and promptly delivered to the pathologist. Intra-operative specimen radiology was also performed if indicated.

Pathological examination

Histopathological analysis was standardised in the 3 centres. The macroscopic examination consisted of measuring the specimen in 3 dimensions and opening the lumpectomy piece to determine the greatest dimension of the tumour. Margin samples were then inked, and the specimens were fixed in formalin. The same procedure was used for the lumpectomy and the cavity margins. The margins were considered positive when cancer was identified less than 2 mm from any inked border.

Data collection

The following data were collected from the charts of all included patients: age, personal history of breast cancer, menopause status, preoperative imaging tumour size (US scan and/or mammogram and/or magnetic resonance imaging), histological tumour size and volume, tumour type, histological grade (Scarff, Bloom and Richardson), oestrogen

receptor status, progesterone receptor status, HER2 status, lymph node status, and local recurrences.

Modifications of breast cancer management

A systematic cavity shaving analysis was included in management decisions during multidisciplinary committee meetings in the 3 centres. We considered systematic cavity margins as useful when re-excision was avoided or multifocality was diagnosed.

Follow-up

All patients had a long-term follow-up of at least 4 years, which consisted of biannual clinical examinations and annual breast radiography.

Table 1
Clinical characteristics, histopathological characteristics and margin status.

	<i>n</i> or median	% or range
Age, years	57	[28–91]
Personal history of cancer	47	16%
Menopause	185	63%
Tumour size (US scan, before surgery), mm	12	[2–50]
Histological size, mm	17	[2–85]
Histological type		
Invasive ductal carcinoma	129	44%
In situ ductal carcinoma	35	12%
Invasive ductal carcinoma+ in situ ductal carcinoma	98	33%
Invasive lobular carcinoma	21	7%
In situ lobular carcinoma	1	<1%
Invasive lobular carcinoma + in situ lobular carcinoma	8	3%
Invasive ductal carcinoma + invasive lobular carcinoma	2	<1%
Tumour grade, invasive carcinoma (<i>n</i> = 258)		
I	95	37%
II	121	46.9%
III	42	16.3%
Tumour grade, in situ carcinoma (<i>n</i> = 142)		
Low	21	15%
Intermediate	58	49%
High	63	44%
Positive oestrogen receptor	214	73%
Positive progesterone receptor	150	51%
HER2 overexpression	35	12%
Positive lymph node	71	24%
Lumpectomy volume, cm ³	48	[3–446]
Positive lumpectomy margins	129	44%
Cavity shaving		
2	46	16%
3	50	17%
4	198	67%
Total cavity shaving volume, cm ³	16	[1–272]
Positive cavity shaving (<i>n</i> patients)	98	33%
Positive cavity shaving (<i>n</i> pieces)		
1	54	18%
2	33	11%
3	6	2%
4	5	2%
Positive cavity shaving margins	69	24%

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