



Original article

The locoregional recurrence post-mastectomy for ductal carcinoma in situ: Incidence and risk factors



Sahar Bannani ^{a,*}, Sophie Rouquette ^{a,b}, Cecile Bendauid-Athias ^a, Patrick Tas ^a,
Jean Levêque ^{a,b}

^a Surgical Oncology Department, Eugène Marquis Comprehensive Cancer Center, Rue de la Bataille Flandres Dunkerque, F-35 000, Rennes, France

^b Department of Gynecology, Anne de Bretagne University Hospital, 16 Boulevard de Bulgarie, BP 90 347, F-35 203, Rennes, Cedex 2, France

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ABSTRACT

Background: The objective of this retrospective study was to determine the incidence of recurrence of breast cancer after mastectomy for ductal carcinoma in situ (DCIS) in our institution, and to evaluate the associated risk factors while comparing them to those proposed in the literature.

Methods: The files of 218 patients who had undergone mastectomy for pure DCIS or DCIS with micro-invasion at Centre Eugène Marquis between January 2003 and November 2013 were compared for: age at diagnosis, type of mastectomy and immediate reconstruction, tumor characteristics, and the evaluation of the sentinel axillary lymph node. The mean follow-up period was 30.5 months.

Results: In a mean period of 39.13 months, 8 patients (3.67%) developed a recurrence post-mastectomy, 2 of whom with distant metastasis. Two others developed distant metastases subsequently during treatment. All 4 died due to progression of metastases, while the other 4 are alive and disease-free after treatment. The only risk factor was young age at initial diagnosis (<40 years). None of the other factors described in the literature, such as high grade or diffuse disease, comedo-necrosis, positive margins or micro-invasion were statistically significant.

Conclusion: The recurrence of breast cancer after mastectomy for DCIS is rare, however, it carries a high mortality rate for those who do relapse. Patients who have high risk factors such as young age at diagnosis and high risk tumor factors should be followed closely for signs of recurrence and/or metastasis.

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Introduction

Ductal carcinoma in situ (DCIS) is a pathological process in which malignant epithelial cells proliferate in the lactiferous ducts of the mammary gland without invading the basement membrane [1]. With current advances in breast imaging and large-scale screening programs, the incidence of detection of DCIS has increased dramatically, from 3–5% of breast cancer cases 20 years ago, to 20–25% nowadays [2–6]. DCIS is a precancerous lesion that may progress to invasive breast cancer [7] which justifies active management: treatment options for DCIS are either breast

conservative therapy (BCT) which consists of lumpectomy followed by radiotherapy, or mastectomy in the presence of extensive or multifocal disease [8]. The cancer recurrence after mastectomy for DCIS is rare [9–19], however, it remains serious in terms of prognosis: the objective of this work was to determine the incidence of post-mastectomy recurrence in our institution and to compare the risk factors we found to those proposed in the literature.

Patients and methods

Patients' characteristics

This is a retrospective study of the records of 679 patients treated for DCIS between January 2003 and November 2013 at the Center Eugène Marquis in Rennes, France. Four hundred and sixty-six (68%) were treated with conservative surgery followed by adjuvant radiotherapy. The indications for a BCT were a small

* Corresponding author. 14 rue Daniel Danielis, 56000 Vannes, France. Tel.: +33 629806811.

E-mail addresses: s.bannani@hotmail.com (S. Bannani), sophie_rouquette@yahoo.fr (S. Rouquette), c.bendauid@rennes.unicancer.fr (C. Bendauid-Athias), ptas@atalante-pathologie.fr (P. Tas), jean.leveque@chu-rennes.fr (J. Levêque).

unifocal tumor relative to breast volume allowing an acceptable aesthetic post-op result, and the patient's ability and willingness to comply with the post-operative radiotherapy. Of the 218 (32%) remaining cases, 102 (46.8%) had breast-conservative surgery as initial treatment, followed by a mastectomy due to positive margins. The remaining 116 patients (53.2%) had a mastectomy as initial treatment, either because of extensive and/or multifocal disease on pre-operative imaging, a previous ipsilateral breast tumor treated by a BCT, or patient's preference (due to old age hence difficulty of maintaining radiotherapy sessions, or fear of recurrence). The margins of mastectomy specimens were not systematically analyzed, and therefore were not included in this study. However, positive margins were reported in five patients; two received adjuvant radiotherapy followed by hormonal therapy in one case, the other three did not receive any adjuvant treatment.

Methods

Patients who had a history of BCT for an ipsilateral DCIS then subsequently relapsed in the form of DCIS were included, as well as patients who had had a contralateral cancer whether in situ or invasive. Cases of DCIS with micro-invasion (DCISM, defined as less than 2 mm) and/or sentinel lymph node involvement were also included. Only patients with a history of ipsilateral invasive cancer were excluded.

The protocol used in our pathology lab to analyze mastectomy specimens consisted of making a large block of 6 × 6 cm centered around the lesions (as shown in radiograph), followed by microscopically analyzing a slide of 5 micron in every 4–5 mm of the block. If the tumor is larger than 6 × 6 cm, a slide of 5 micron is analyzed in every 4–5 mm outside the block.

Sentinel lymph nodes (SLN) were analyzed either by standard histopathology or by One-Step Amplification of Nucleic Acids (OSNA[®], Sysmex Corp, Japan).

Locoregional recurrence (LRR) was defined by the ipsilateral appearance of histologically proven cancerous lesions - whether on the chest wall, the axillary tail of the breast or in the axillary fold.

The two groups of patients (no LRR vs. LRR after mastectomy) were compared for: age at first diagnosis, grade and size of the DCIS, the quadrant involved and multifocality, the presence of comedo-necrosis, micro-invasion or positive sentinel lymph node, and the type of mastectomy and reconstruction. The mean follow-up period was 30.5 months (2.5 years, range of 0–113 months). Given the importance of biological age and hormonal status of the female population, patients were divided again into two groups: those aged 40 years or younger at diagnosis, and those more than 40 years. Table 1 summarizes the patients' characteristics.

Fischer's exact test was used to compare the groups, with a statistically significant *p*-value of ≤0.05.

Results

Table 2 describes the characteristics of patients with recurrences as well as the characteristics of their initial and recurred diseases.

Out of 218 DCIS cases treated with mastectomy, 8 (3.67%) had developed a LRR after a mean period of 39.13 months (3.2 years, range 7–67 months), suspected by clinical examination and later confirmed by cytology or histopathology. Three (37.50%) recurrences were on the chest wall, 3 in the axillary tail, 1 (12.50%) in the axillary lymph nodes and 1 in the sub-clavicular lymph nodes. All 8 recurrences were in invasive form, with a tendency towards high grade disease (62.50% had grade 3 disease). Only 2 patients (25%) had distant metastasis at the time of diagnosis,

Table 1
Patients' characteristics.

	All patients	Patients without LRR No. (%)	Patients with LRR No. (%)	<i>p</i>
Number	218	210 (96.33%)	8 (3.67%)	
Mean age at diagnosis (years)	53.69 (range 31–82)			
≤ 40 years	21	18 (8.57%)	3 (37.50%)	0.0316
> 40 years	197	192 (91.43%)	5 (62.50%)	
Initial surgery				
Conservative then mastectomy	102 (46.79%)	98 (46.67%)	4 (50%)	1.0000
Mastectomy	116 (53.21%)	112 (53.33%)	4 (50%)	
Type of mastectomy				
Simple	64 (29.36%)	61 (29.05%)	3 (37.50%)	0.6954
Skin-Sparing	154 (70.64%)	149 (70.95%)	5 (62.50%)	
Immediate reconstruction	148 (67.9%)	143 (68%)	5 (62.5%)	0.5409
Implant	128 (58.72%)	124 (59.05%)	4 (50%)	
Latissimus dorsi flap	11 (5.05%)	10 (4.76%)	1 (12.50%)	
Latissimus dorsi flap and implant	9 (4.13%)	9 (4.29%)	0	
Mean size (mm) ^a	52.85 (range 4–140)	52.67 mm (range 4–140 mm)	57.38 (range 42–82 mm)	
Nuclear grade^b				
1	22 (10.23%)	22 (10.63%)	0	0.4020
2	79 (36.74%)	74 (35.75%)	5 (62.50%)	
3	114 (53.02%)	111 (53.62%)	3 (37.50%)	
Presence of comedonecrosis ^c	93 (43.46%)	89 (43.20%)	4 (50.00%)	0.1942
Presence of microinvasion ^b	13 (6.05%)	11 (5.31%)	2 (25.00%)	0.0770
Presence of positive sentinel axillary lymph node ^d	3 (2.29%)	3 (2.38%)	0	1.0000
Presence of multifocal disease	61 (27.98%)	61 (29.05%)	0	0.3218
History of previous breast cancer^b	11 (5.12%)	9 (4.35%)	2 (25%)	0.0564
Ipsilateral	6 (2.79%)	6 (2.90%)	0	1.0000
Contralateral	5 (2.33%)	3 (1.45%)	2 (25%)	0.0115
Concomittant Contralateral Breast Cancer ^b	7 (3.26%)	7 (3.38%)	0	1.0000

^a Data missing for 5 patients.

^b Data missing for 3 patients.

^c Data missing for 4 patients.

^d Of the 131 patients who had the sentinel axillary lymph node evaluated.

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