

Original Article

## **Surgical Margin Status after Breast Conservation Surgery at Aga Khan University Hospital Nairobi**

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### **Abstract**

**Background:** The conservation of the breast in a woman after diagnosis of breast cancer plays a vital role in the overall management of the patient. While the cosmetic outcome enhances the patients' self-image, assurance of clear margins is essential in prognostication. An analysis was carried out to assess the adequacy of surgical margins at our unit. **Methodology:** Retrospective analysis of breast surgery for breast cancer patients was done from 2008 to 2011 at Aga Khan University Hospital. **Results:** Twenty one patients with breast cancer had breast conservation surgery with an average age of 44.8 years. The commonest histological diagnosis (71.4%) was invasive ductal carcinoma. Negative margins were obtained in 85.7%. Modified radical mastectomy was performed on patients who had residual tumour after re-excision. **Conclusion:** Breast conservation surgery can yield acceptable margin status with appropriate clinical and radiological selection of patients with early breast cancer.

**Key Words:** Breast conservation surgery, Surgical margins

## **Introduction**

Breast conservation therapy involves the excision of the tumor (lumpectomy) and post-operative radiotherapy. It has become the preferred method of management for patients with breast cancer in stage 0, I and II (1). The increase in breast cancer screening programs has led to detection of early breast cancer, thus breast conservation therapy is becoming more available. Excision of the tumor with adequate margins and preservation of the cosmetic integrity of the breast are the primary goals of the surgeon performing breast conservation therapy. Breast conservation therapy has similar long term survival rates with radical mastectomy (2). It has also been shown to be as effective as radical mastectomy in terms of local tumor control, recurrence free survival and a 20 year overall survival (3). Further patients who have undergone breast conservation experience easier social adjustments compared to mastectomy for early breast cancer, fewer problems with clothing and better body image (4, 5).

The surgical margin status after breast conservation surgery (BCS) determines the success of the procedure. Margins need to be clear after BCS to minimize the rate of tumor recurrence. The risk of local recurrence associated with a positive margin is approximately 2 to 3 times that compared with a negative margin (6). Positive margins are addressed by re-operative lumpectomy or mastectomy (7).

Breast conservation surgery has been practiced at Aga Khan University Hospital (AKUH) since 2008. A retrospective analysis of breast conserving surgery was done to assess the state of surgical margins after breast conservation surgery as a guide on the success of the procedure. The study aims to demonstrate whether clinical, radiological and pathological selection of patients for BCS yields acceptable margin status as confirmed by frozen section and histology.

## **Methodology**

A retrospective analysis of all patients who had breast cancer surgery between 2008 and 2011 was done. Information on the biodata, size of tumor, histological diagnosis and margin status was collected. This data was entered to an excel spreadsheet and presented in tables and graphs.

The criteria used for breast conservation surgery was early breast cancer described as stage 0 which indicates ductal carcinoma in situ or lobular carcinoma in situ, stage 1 when tumor is less than 2 cm and stage II described as tumor between 2 and 5 cm. However, tumor size relative to breast size was a consideration where a large tumor in small breast was a relative contraindication to BCS. Contraindications for BCS included pregnancy, multicentric disease and previous history of radiation to the affected chest wall.

A needle core biopsy for histology and hormone status was done prior to surgical intervention. A follow up mammogram and ultrasound where necessary, was done to rule out multicentricity of disease.

Intra-operatively, the incision was made with a clear margin of 1 cm of grossly normal breast tissue around the mass with excision of the skin overlying the mass. The dissection was done with a gross margin of 2cm. Gross manipulation of the mass such as aggressive palpation of the mass was avoided to preserve the architecture of the lesion and to avoid distortion of the margins. The specimen was then labeled and sent to the laboratory for frozen section analysis, the results of which were communicated to the surgeon by phone call. This was reported as either positive or negative.

Positive margins were defined as tumor within 2mm of the resected margins, while negative margins as absence of tumor within 2mm of resected margins. When the margin status was reported as positive, the surgeon performed re-excision at the same sitting. The margin status was later confirmed by histopathology. Patients who had positive margins on histology underwent mastectomy at a later date. Patients with positive axillary lymphadenopathy had axillary lymph node dissection. Sentinel lymph node biopsy was performed on patients with non-palpable nodes. Histology was performed to grade the tumor (1, 2 or 3) defining the level of differentiation of the tumor which predicts the aggressive potential of the disease.

## **Results**

General characteristic of patients who had breast conservation surgery is shown in table 1 below. Ninety six patients had breast surgery with twenty one (21.9%) having breast conservation therapy. The average tumor size was 2.35cm. The average age was 44.8 years.

Insert Table 1 here

Eighteen (85.7%) of the patients who underwent breast conservation had negative margins. Three (15.3%) patients had positive margins after frozen section and had re-excision of the tumor performed in the same sitting as the lumpectomy. Two out of the three had positive margins after re-excision and had subsequent modified radical mastectomy.

## **Discussion**

About one in every five patients with breast cancer had breast conservation therapy. This is lower than what models have illustrated BCS to be appropriate in 48% of cancer patients (8). This could be explained by few patients presenting in early stage of breast cancer in our setting.

We report a negative margin rate of 85.7% in patients undergoing BCS. Majority of these patients had tumors less than 2cm. Seventy two percent of them had invasive ductal carcinoma, half of them had tumor grade III and only 30% with nodal metastasis. The tumor grade and nodal involvement did not influence margin status adversely as demonstrated in other studies (9).

Three out of twenty one patients had positive margins and had subsequent re-excision. The re-excision rate of 14.3% at AKUH is comparable to published rates of 13-72% (10-12) in other centers. The wide variability in margin definition is associated with different re-excision rates.

We considered margins to be positive if tumor was within 2mm of the resected margins. Wider margins of 5mm have been used in other centers although there's no significant difference in local recurrence rates with margins greater than 2mm (13).

Two of the three patients who had positive margins after re-excision had a modified radical mastectomy. This was associated with gross tumor size greater 2.5cm. Studies that analyzed tumor size reported it to affect margin positivity (14, 15). Jorns et al demonstrated this association was consistent with tumors larger than 2cm (16). Two out of the three patients with positive margins were below 40 years. This is in keeping with other studies that have shown young age (below 40 years) to be a factor associated with margin positivity (10). The two patients with persistent positive margins after re-excision of tumor had characteristics that may have favored the positivity. One of the patients had dense breast on mammography which has been linked to difficult radiographic and intra-operative localization of the tumor (17). The second patient had multifocal disease which was demonstrated during histology. This finding supports several studies that have demonstrated multifocal disease adversely affects the margin status (11, 14, 18).

Other factors that have been cited by other studies to influence margin positivity include lobular histology and lympho-vascular invasion, metastatic axillary lymphadenopathy and presence of micro-calcification on mammography (9). However, these factors did not influence the margin status in our series possibly due to the low volumes.

## **Conclusion**

Breast conservation surgery can be carried out with comparable margin status when adequate patient selection, radiological and pathological work up is made. In the absence of frozen section, the clinical, radiological selection can yield an acceptable margin status for breast conservation surgery.

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Table 1-general characteristic of patients who had BCS

<b>Characteristic</b>	<b>Number of patients (n=21)</b>	<b>Positive margins (n=2)</b>
Age		
<40 years	6 (29)	1
>40 years	15 (71)	1
Tumor size		
< 2cm	7 (33)	
>2cm	14 (67)	2
Grade		
1	2 (10)	
2	6 (29)	1
3	13 (61)	1
LVI		
Present	9 (43)	1
Absent	12 (57)	1
Nodal metastasis		
Present	2 (10)	0
Absent	19 (90)	2
Histology		
Lobular	1 (5)	0
Ductal	17 (81)	2
Other *	3 (14)	0
Multifocality		
Present	1 (5)	1
Absent	20 (95)	1

Values are presented as number(%)

LVI Lympho-vascular invasion; \* medullary, tubular, mucinous carcinoma