

## Assessment of Tumour Free Margins Pathologically By Painting of Surgical Specimen In Case Of Carcinoma Breast

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**Abstract:** Surgical margin as read in a pathology report define the histological measurement of normal or unaffected tissue surrounding the visible tumor under a microscope on a glass mounted histology section. A surgeon often performs a second surgery if a narrow or involved surgical margin is noted on a pathology report. The tumor with surrounding tissue is painted with a special ink so that the outer edges, or margins, are clearly visible under a microscope. If the margins are positive, more surgery is needed. In this study 25 cases of breast cancer were considered. After surgery (lumpectomy/ mastectomy) the surgical margins of specimen were marked with paint and sent for histopathological examination to observe the involvement of margins. Margins positive histopathologically were reoperated.

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### I. Introduction

Surgical margin define the histological measurement of normal or unaffected tissue surrounding the visible tumor under a microscope. The tumor with surrounding tissue is painted so that the outer edges, or margins, are clearly visible under a microscope. This is especially important in deciding whether additional surgery is needed. If the margins are positive, revision surgery is needed. There is consistency in studies that the risk of local recurrence is reduced with very wide margins, e.g. more than 10mm of tumour-free tissue. Therefore, efforts to reduce the number of positive margins should focus on optimizing the surgical procedure itself, because the surgeon lacks real-time intraoperative information on the presence of positive resection margins during breast-conserving surgery.<sup>1</sup>

### II. Review Of Litrarure

Color Coding Surgical Margins with The Davidson Marking System demonstrated by A.V. et al concluded that a common problem faced by pathologists is interpreting surgical margins of tumor biopsies. Surgical margins of a biopsy are commonly painted with a dye that adheres to tissue and is visible under the microscope. This is essential to assess complete/incomplete excision of a tumor. Biopsy margin painting can be done on unfixed or fixed tissues. . The use of different colors (black, blue, green, red, yellow, etc.) for different aspects of mass orientation is superior to using sutures of different colors.<sup>2</sup>

In a study done by Tampi C, she demonstrated that Multiple colors allow identification of five surgical margins rather than just three i.e. two short axis margins, two long axis margins, and the deep margin. Evaluation of the five surgical margins can identify the specific site of an existing tumor and its probable extent beyond the surgical margin of resection for the attending surgeon. Re-excision of the involved margin can then be performed. Coloring gross specimen excision margins with different colors, adds precision to margin examination. It allows postoperative comparison of tissue planes predicted by preoperative imaging. It maintains orientation of grossed and dissected specimens, enabling the pathologist to re-visit the grossed specimen, if required, and confidently allows further sampling if necessary. The study identified specific shades within a brand of acrylic colors that are easily available and simple to use, with good results on microscopic examination.<sup>3</sup>

### Aims And Objectives

1. To study the effectiveness and accuracy of the tumor free margins after painting the specimen margins with colored ink.
2. To study the margins in three categories: Negative margins, positive margins, Close margins.
3. To consider for the re-surgery in case of positive margin (for that specific margin/surface only).
4. To treat the specimen of re-surgery in same way.

### III. Material And Methods

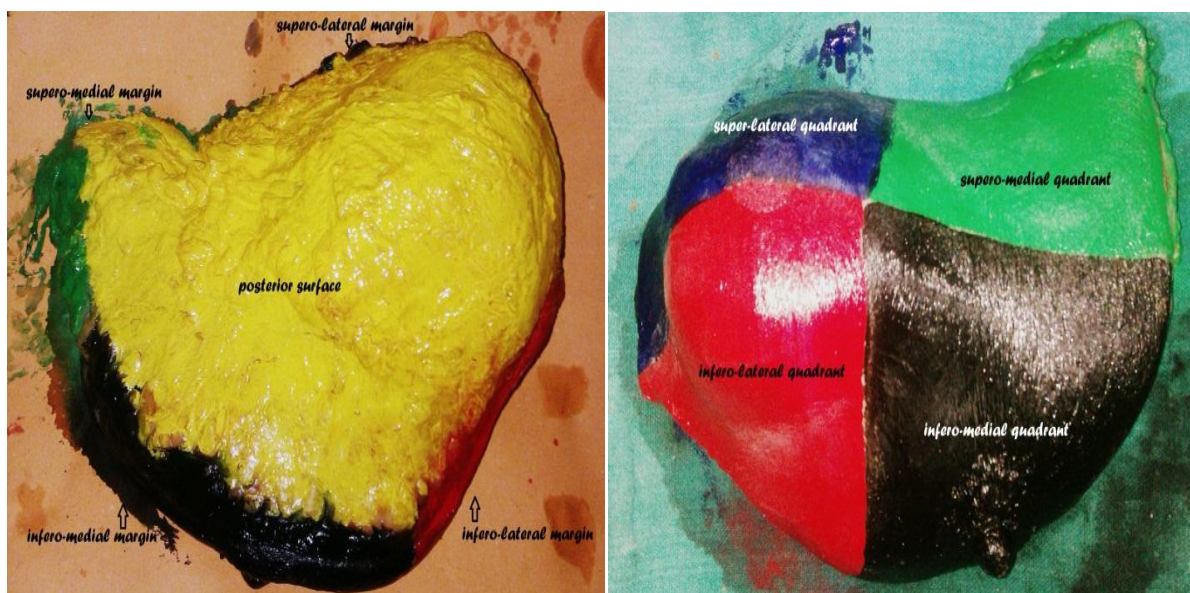
In this study, 25 cases of breast cancer were considered for study. After surgery (Lumpectomy /mastectomy), the specimen was marked for the medial and lateral corner with thread. Margins of specimens were painted as supero-lateral, infero-lateral, supero-medial and infero-medial with different colored inks. Five different colors were used-Blue, Red, Green, Black, and Yellow. The colors indicating respective margins were recorded. Yellow color was used for the inner surface. The specimen after painting was allowed to get dried of the colors before putting in formalin. The color is retained and was helpful to define the margin and extent of invasion. Acrylic colors were used for study.

### IV. Observation

The present study was conducted in the Department of General Surgery of Guru Nanak Dev Hospital attached to the Government Medical College Amritsar. Total of 25 patients with diagnosis of carcinoma breast admitted to this hospital between 01/01/2013 to 30/06/2014 were taken up for study.

maximum incidence of cases (18) was seen in the age group of 41-60 (72%). 4 cases were seen in the age group 21-40 (16%), and 3 cases were seen in the age group 61-80 (12%). All cases were of female sex and none was male. 1 case was of size <2cm (4%), 14 cases were of size 2-5cm (56%), and 10 cases were >5 cm in size (40%). The right breast was involved in 11 cases (44%), and the left breast was involved in 14 cases (56%). 16 cases involved the supero-lateral quadrant (64%), 3 cases involved the infero-medial quadrant (16%), 4 cases were noted in the supero-medial quadrant, and 1 case each was seen in the infero-lateral quadrant and central area. Clinically palpable lymph nodes were found in 17 cases (68%), while they were not found palpable in 8 cases (32%). 11 cases presented in stage II Ca breast (44%), 13 cases presented in stage III (52%), and one case presented in stage IV Ca breast (4%). The most common histology of carcinoma of breast was found to be intraductal carcinoma seen in 18 cases (72%). fibrocystic disease with metastasis was seen in 2 cases ( 8% ), 1 case each of medullary carcinoma, squamous cell carcinoma, adenosquamous carcinoma ,ADH (ductal carcinoma in-situ/atypical ductal hyperplasia) and Microinvasive ductal carcinoma was noted was noted (4% each).

6 cases of resected carcinoma breast were detected to have positive margins (24%), whereas 19 cases had negative margins (76%). Out of the 6 cases that had positive margins re-surgery was done in 2 cases and the specimen was painted and sent for HPE which came out to be negative for both cases. superolateral and superomedial margin was positive in 1 case, inferomedial and anterior margin was present in 2 cases each, posterior margin was present in 3 cases, and inferolateral was not involved in any of the cases. Superolateral and posterior margin was present in same case, one case of anterior margin was also involving posterior and case involving inferomedial margin was associated with involvement of posterior margin making total no of positive cases "6". out of 6 positive cases ,re-surgery was performed in 2 cases and in 4 cases no surgical intervention was done. out of 2 cases in which re-surgery was done, histopathology report for margin status came out to be negative for both cases. out of 25 cases recurrence occurred in 1 case and in other 24 cases it was absent, 22 cases were uneventful, wound dehiscence, wound infection and flap necrosis occurred in one case each.





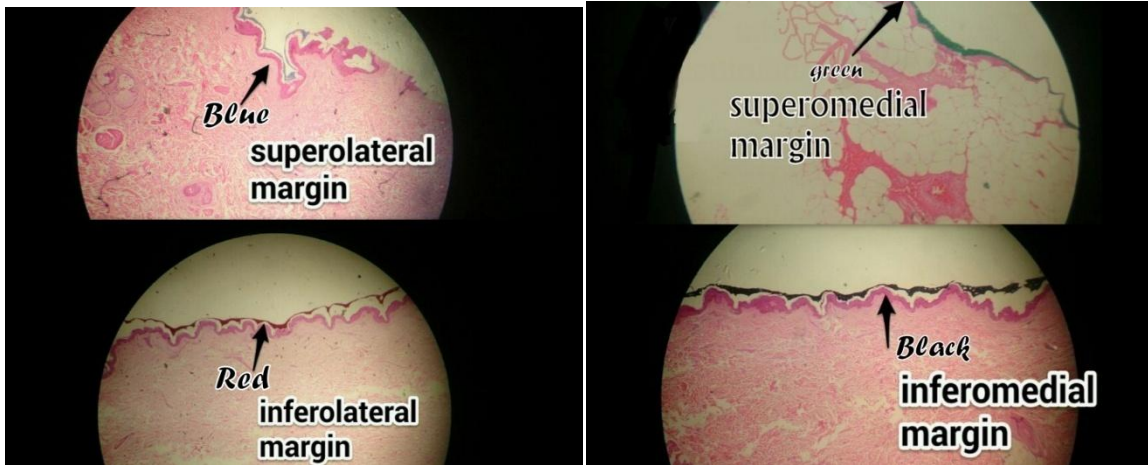


Fig.1-4 Pictures showing gross and microscopic appearance of painted surgical specimen

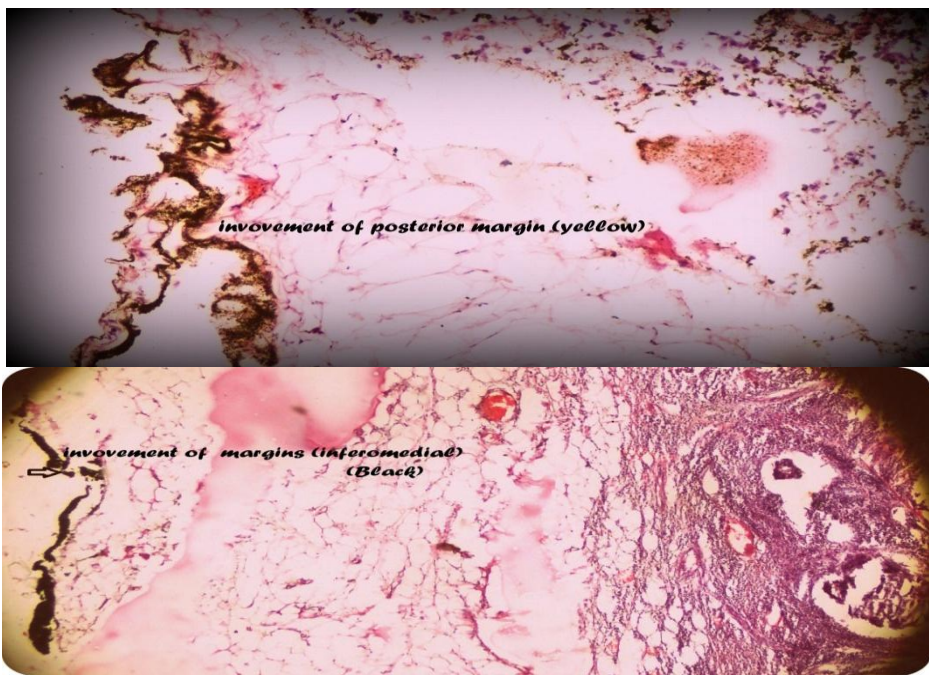


Fig. 5-6 Microscopic appearance of involved margin

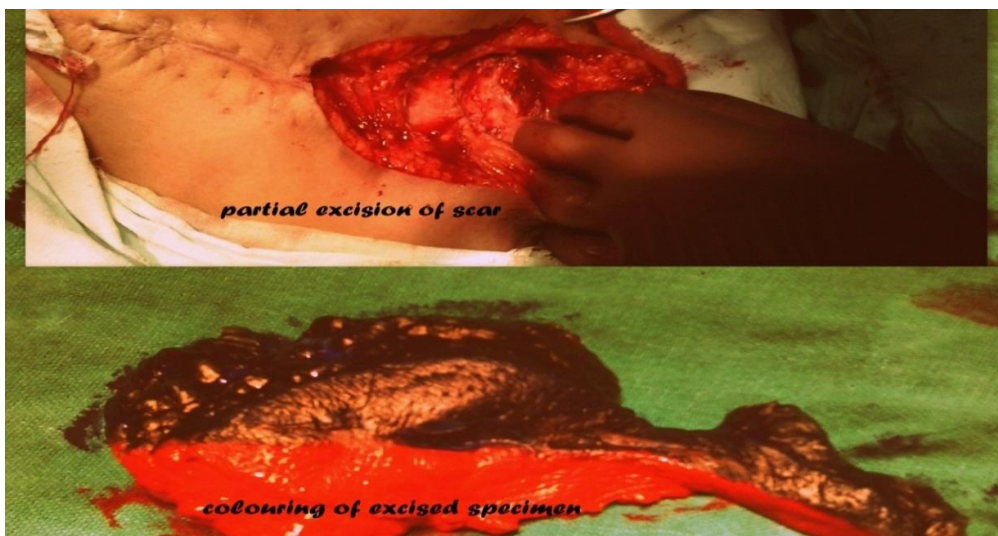


Fig. 7 picture showing re-excision and coloured specimen.



Fig 8. Picture showing microscopic appearance of re-excised specimen

## V. Discussion

Our study shows that maximum incidence of cases (18) was seen in the age group of 41-60 (72%). 4 cases were seen in the age group 21-40 (16%), and 3 cases were seen in the age group 61-80 (12%). The results are consistent with study done by Kakarala M et.al which shows that Indian women are more likely to develop breast cancer at earlier ages than their Western counterparts<sup>4</sup> and that breast cancer peaks from ages 45-50 years in India.<sup>5</sup> Study show that all cases were of female sex and none was male. This may be due to small sample size but various studies in past shows that female breast carcinoma is much more common than male breast carcinoma. Our study shows that 1 case was of size <2cm (T1=4%), 14 cases were of size 2-5cm (T2= 56%), and 10 cases were >5cm (T3=40). Recent studies shows that in western countries this scenario is opposite with respect to size of tumor at time of presentation.<sup>7</sup>

The right breast was involved in 11 cases (44%), and the left breast was involved in 14 cases (56%). This is in consistency to a cohort study which shows that involvement of left breast 753 (51%) is slightly more than right 724 (49%).<sup>7</sup>

Our study shows that 16 cases involved the supero-lateral quadrant (64%), 3 cases involved the infero-medial quadrant (12%), 4 cases were noted in the supero-medial quadrant (16%), and 1 case each was seen in the infero-lateral quadrant and central area (4%) each. Our result are similar to a study showing the site of breast cancer in different quadrants in two cohorts during 1957-59 and 1997-99. During 1997-1999 the frequency of involvement of different quadrants were UOQ 788 (53.4%), LOQ 147 (10%), UIQ 175 (11.8%) LIQ 91 (6.2%) and Central 69 (4.7%).<sup>7</sup>

Clinically palpable lymph nodes were found in 17 cases (68%), while they were not found palpable in 8 cases (32%).

Our study shows that 11 cases presented in stage II Ca breast (44%), 13 cases presented in stage III (52%), and one case presented in stage IV Ca breast (4%). Various other studies show that nearly all breast cancer cases are clinically detected in India<sup>8</sup> with the majority presenting with locally advanced disease<sup>9</sup>. Nearly one-third of breast cancer patients have skin/chest wall involvement at the time of presentation.

In our study MRM was performed as a surgical procedure in all out of 25 cases as most of the patients were locally advanced breast cancer.

The most common histology of carcinoma of breast was found to be intraductal carcinoma seen in 18 cases (72%). fibrocystic disease with metastasis was seen in 2 cases (8%), 1 case each of medullary carcinoma, squamous cell carcinoma, adeno-squamous carcinoma, ADH (ductal carcinoma in-situ/atypical ductal hyperplasia) and Microinvasive ductal carcinoma was noted was noted (4%) each. Our result is consistent with all other studies which shows that intraductal carcinoma is most common of all types.<sup>6</sup>

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Our study shows that superolateral and superomedial margin was positive in 1 case, inferomedial and anterior margin was present in 2 cases each, posterior margin was present in 3 cases, and inferolateral was not involved in any of the cases.

Superolateral and posterior margin was present in same patient, one case of anterior margin was also involving posterior and case involving inferomedial margin was associated with involvement of posterior margin making total no of positive cases "6". out of 6 positive cases ,re-surgery was performed in 2 cases and in 4 cases no surgical intervention was done and out of 2 cases in which re-surgery was done, histopathology report for margin status came out to be negative for both cases

Study showed that out of 25 cases recurrence occurred in 1 case and in other 24 cases it was absent. also 22 cases were uneventful, wound dehiscence, wound infection and flap necrosis occurred in one case each.

## **VI. Summary & Conclusion**

It was noted that the use of different colour for different margin results in better assessment of pathological report. The colours used were clearly distinguishable. The colour was retained during all processing of specimen and was visible in slides blocks and microscopically. Due to painting of different margins with different colours the resurgery was needed for a specific margin only avoiding a major resurgery and burden on patient and the rate of resurgery was also reduced.

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