



**THE USE OF SURGICAL CLIPS FOR TUMOUR LOCALIZATION IN BREAST
CANCER PATIENTS RECEIVING NEOADJUVANT CHEMOTHERAPY PLANNED FOR
BREAST CONSERVATION SURGERY- A CASE REPORT**

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ABSTRACT

Radiopaque marker localization of the tumour bed (TB) before neoadjuvant chemotherapy (NACT) in breast cancer patients is the recommended technique since it helps in accurate tumour localization at the time of breast conservation surgery. However, the high cost of commercial tumour markers give rise to significant financial toxicity to patients in low and middle income countries. We describe the case of a 58-year-old woman who was diagnosed with triple negative breast cancer (TNBC), early stage and node negative. In an effort to reduce the expense of treatment, we used titanium surgical clips in place of the commercial tumour markers, prior to NACT using bone marrow aspiration needle using palpation method. The usage of surgical clips is a highly valuable tool with limited complications and more importantly, are significantly less expensive than commercial breast tumour clips.

KEYWORDS: breast neoplasm, tumour localization, surgical clip, breast conservation surgery, case report.

INTRODUCTION

Breast cancer is one of the most common malignancies affecting females, comprising up to ~31% of all cancers among females.^[1] Neo-adjuvant Chemotherapy (NACT) has revolutionised the way Triple negative and Her 2 enriched breast cancer is treated with increasing acceptability in early breast cancer management.^[2] Complete pathologic complete response (pCR) following the NACT is often observed.^[2] Thus tumour clipping prior to NACT is an important management strategy so as to achieve a good breast conservation.

The recommended method for tumour localisation is an implant in the tumour bed (TB).^[3] The majority of commercially available markers and clips are expensive, which prompts surgeons in low and middle income countries to look for less expensive options. One such option is the titanium surgical clip. They are inexpensive, widely accessible, and also safe for patients.^[4] We describe case of a 58-year-old woman who presented at the surgical oncology clinic of our institute with complaints of a palpable mass in the left breast, a diagnosis of Infiltrating Ductal Cancer Grade III was

made and subsequently underwent tumour clipping prior to NACT.

CASE REPORT

A 58-year-old woman presented at the surgical oncology clinic of our institute with complaints of a palpable mass in the left breast. The mass was first noticed by the patient herself and had been increasing in size for past 5-6 months. There was no associated pain, nipple discharge, or any skin changes including nipple retraction.

Patient had not sought medical care previously. Her only significant medical history was presence of comorbidities - Type II Diabetes Mellitus and Hypertension, which were controlled with oral medications. There was no history of prior surgical intervention or cancer in the family.

The patient appeared to be generally well, conscious, and oriented. Her performance status according to the Eastern Cooperative Oncology Group (ECOG) was 0. Physical examination of the left breast revealed a mass

measuring approximately 3.0 cm x 2.5 cm in the upper inner quadrant at 9 o'clock position. The mass was firm, non-tender, and mobile with no fixity to the overlying skin or underlying pectoralis major muscle. Examination of the ipsilateral axilla showed no abnormality. The right breast, axilla and supraclavicular fossae were also normal, the systemic review revealed no findings.



Figure 1: Left breast showing a mass measuring approximately 3.0 cm x 2.5 cm in the upper inner quadrant at 9 o'clock position.

A left breast mammogram revealed an irregular mass lesion without any micro calcifications or architectural distortions in the upper inner quadrant close to the chest

wall. Furthermore, Ultrasonography revealed an uneven mass lesion of approximately 3.0 cm x 2.7 cm in size with no abnormal nodes in the axilla, the Right breast and axilla were normal. Routine blood investigations were unremarkable. The core biopsy Histopathology report was - IDC Grade III with a modified RB score of 3+3+2, Immunohistochemistry (IHC) revealed TNBC with a Ki67 value of ~90%. Work up for metastasis was negative. Breast cancer was staged as cT₂N₀M₀.

In view of the TNBC subtype with high mitotic index (Ki67~ 90%), the patient was planned for NACT and insertion of titanium surgical clips into the TB. Under aseptic precautions and local anaesthesia, 2 liga clips (laparoscopic no. 100) were inserted into the tumour utilising bone marrow biopsy needle. Using palpation method, the clips were placed in the center of the palpable tumor. The position of the clips was confirmed using X-ray mammography after 7 days of the procedure. Thereafter, NACT was administered that included 4 cycles of cyclophosphamide/anthracycline and 4 cycles of paclitaxel (4AC + 4T). Follow-up mammography was done before elective surgery to evaluate the treatment response to NACT.

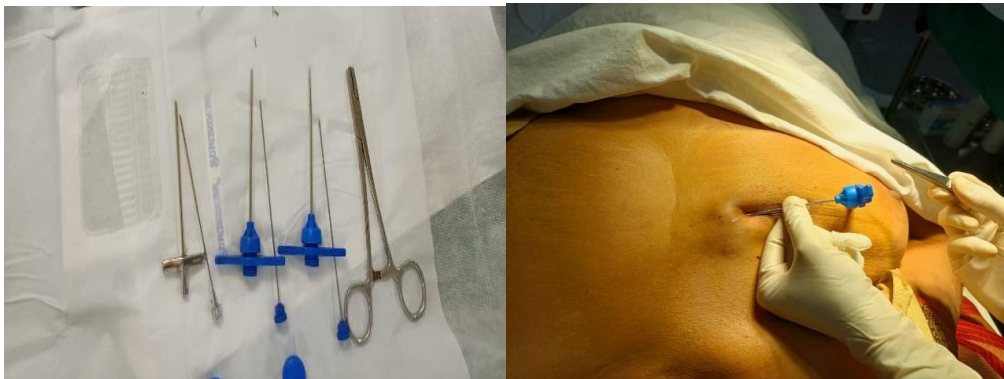


Figure 2a & 2b: Liga clip insertion using bone marrow biopsy needle.

Following this, she underwent right breast conservative surgery i.e. Wide Local Excision with Axillary Dissection (following Sentinel Lymph Node Biopsy),

and Level I Oncoplasty. The entire mass along with the two clips were removed. The specimen was examined for clip retrieval using specimen mammography.



Figure 3a & 3b: Entire mass and the two clips were removed.

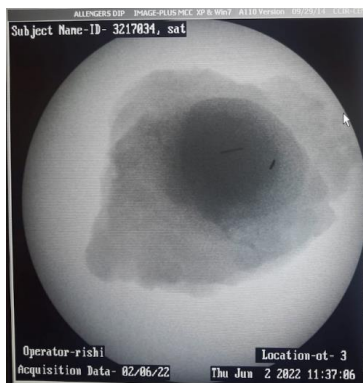


Figure 4: Specimen mammography to look for clip retrieval.

DISCUSSION

Our patient had TNBC for which NACT is a standard of care.^[2] The unpredicted response of the tumour to the NACT, which may be even be a pCR, is associated with the surgeon's difficulty in locating the tumour during surgery.^[5] This demanded the need for radiopaque markers prior to NACT [5]. These markers can then later be removed along with the lesion.

In an effort to keep the expense of this treatment down, we used titanium surgical clips in place of the commercial breast TB markers. This was done utilising bone marrow biopsy needle, under local anaesthesia while undertaking aseptic precautions. Since the method is identical to core needle biopsy technique, it is easy to carry out and clip insertion can be done even at the time of core biopsy.

A single titanium surgical clip cost for our patient was 300 INR, which is equivalent to \$4 USD. When compared to commercial breast tumor markers, which cost 75–200 US dollars per clip, this is highly cost-effective. The use of TB titanium surgical clips is highly economical, especially for developing countries such as India.

CONCLUSION

Before NACT, the use of breast tumour markers is desirable in patients planned for breast conservation surgery. Titanium surgical clips are valuable because they may be placed as an out-patient procedure with far less expense than commercial breast tumour clips. Taking into account cost restrictions for a self-paying patient in a low and middle income country, we may draw the conclusion from this report that there was reduction in financial toxicity to the patient. Titanium surgical clips could be a good option to the commercial breast tumour bed markers in tumour localization in a low cost setup.

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