



Original Article

Wire Guided Wide Local Excision of Clinically Undetectable Breast Cancer - Initial Experience in Bangladesh

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Abstract

Background: With the rise of awareness of breast cancer and better screening mammography, there are increasing number of breast cancers detected before becoming clinically evident. These cancers are mostly treated by wide local excision under guidance of a wire which is put with mammogram and/or USG. In Bangladesh this procedure has never been done. We started it in Surgical Oncology Division in BSMMU with the collaboration of Department of Radiology.

Methods: We have performed the procedure on 7 patients within 19 months. All of them had USG and mammography detected small lesions. The average size being 7.24mm. From needle biopsy 3 cases showed suspicious cytology, 4 had IDCC, and 1 had DCIS. Wire was put in all cases under USG guidance. Wire Guided Wide Local Excision was performed in all cases. \$ patients underwent SLNB.

Results: The age range was between 26 to 55 years with the average age of 43.86 years. 4 of them being post-menopausal. One case came benign. Other were malignant with clear margins. One case had close margin, which was later re-excised. All cases were sent for adjuvant therapy. Histopathology showed 4 patients of invasive ductal carcinoma, 1 patient each of invasive lobular carcinoma, DCIS and 1 being benign.

Conclusion: This well-established procedure can be performed in Bangladesh to meet the goal of ensuring adequate treatment and cosmesis of the patients with impalpable cancer, amidst constrained facilities.

Key Words: wire-guided wide local excision (WG WLE), impalpable breast lesion.

Introduction

Breast cancer is now the leading cancer in female globally¹. 1 in 8 women will have breast cancer in their lifetime². In 2018 there was more than 2 million newly diagnosed cases³. Since the early 1990s,

breast cancer incidence rates have increased by 24% in the UK in females in 20 years⁴. In Bangladesh, breast cancer is the leading cancer⁵.

Like many cancers breast cancer is treated by multi-disciplinary approach. Surgical management often plays the pivotal role. Mastectomy with axillary dissection had been considered to be the only modality of surgery for many years. But with the improvement of knowledge, facilities the treatment has been evolved greatly from the past. There is a paradigm shift from mastectomy to breast conservation. Mastectomy is no longer the treatment of choice. Failure to offer breast conservation to suitable and appropriate patients is now a medico-legal issue⁶.

As there is a poor understanding of the causes of breast cancer, primary prevention is not a realistic or

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achievable option. Earlier diagnosis of breast cancer is more likely to yield favourable outcome⁷. Early detection and improvements in treatment have led to a 30% reduction in breast cancer mortality in UK in all age groups⁸. The current strategy for reducing death from breast cancer is to seek diagnosis at the earliest. Therefore, many nations have adopted the screening programs. Mammography is the screening tool of choice⁹.

The sensitivity of mammography for breast cancer in women above 60 years is about 95%¹⁰. Screening by mammography detected early breast cancer has reduced mortality^{11,12}. Digital Mammography and Stereotactic technique have further improved diagnosis and treatment. Meanwhile high-frequency (>10 MHz) USG can differentiate benign from malignant lesions with high degree of accuracy¹⁰.

Cancers before becoming clinically evident, may be detected by imaging. Incidence of diagnosis of non-palpable tumour is increasing because of screening programs, better imaging and increased awareness. The treatment goal in these patients are to treat cancer and to maintain cosmesis. Offering mastectomies to these patients with very small or impalpable lesions is not practical as former has no survival benefit over the latter^{13,14}. Wire localization and excision is the standard treatment. Preoperative needle localization offers an opportunity to make a rapid and accurate excision with minimal trauma and the least tissue damage.^{15,16,17}

The key to successful management of nonpalpable lesions is accurate localization. Needle localization and subsequent excision was introduced in 1965¹⁸. This technique involves placement of a radiopaque wire percutaneously into or near the lesion either under ultrasound or mammography guidance preoperatively by a radiologist. The wire and mammogram guide the surgeon to the exact site of the lesion and aids excision of optimal tissue¹⁸.

In Bangladesh, there is no national screening program. But owing to increasing awareness and access to better imaging facilities, there are breast cancer cases detected at impalpable stages. Pre-operative image guided wire localization and wide local excision of the lesion with axillary management was performed in Surgical Oncology Unit of BSM Medical University. This was the first time ever of this procedure in Bangladesh. The first case was performed in February

2018 and a total 7 cases have been performed in next 19 months period.

Materials and methods

The study is conducted in Surgical Oncology Division of Bangabandhu Sheikh Mujib Medical University. The time duration was from January 2018 to August 2019. A total of 7 cases were selected. All of them had impalpable breast lesion and was amenable to afford post-operative Radiotherapy and follow up.

There are various designs of localization wire in use. All have some form of anchoring device such as a hook with a splayed or barbed tip. The wire is deployed under stereotactic or ultrasound guidance within a rigid over-sheath cannula, which is then removed when position is satisfactory. The patient is then transferred to the operation theatre with the wire in situ.

All the guidewires were put in Radiology Department by a single radiologist. Wires were put under USG guidance. After introducing the wires, bandage was applied, patients were accompanied by a doctor to the theatre. 20 G x 5.7 cm "BARD Dualok" Breast lesion localization wire were used in 6 cases. In 1 case 25 G spinocaine needle was used because of the unavailability of the wire. The WLE was performed under guidance of the wire and markings by the radiologist. The lesion along with the guidewire were excised with at least 1 cm of clear margins.

A separate incision was made for axilla. SLNB was performed in 4 cases. After antiseptic wash and drapping methylene blue was injected at the subareolar space in these 4 patients. A good massage was applied, and incision was delayed for 10 minutes. On approaching axilla the sentinel nodes were identified by their bright blue hue. Specimens sent for frozen section biopsy after proper marking and labelling. One patient did not undergo frozen section biopsy as she opted for regular paraffin section report for breast lesion margins and she had pre-operative proven metastatic nodes in axilla.

All but one case showed malignancy and all but one case showed clear margins. Re-excision was done of the involved medial margin. After excision clips were put in cavities in malignant cases (to aid booster RT). All breast wounds were closed in layers without drainage and axillary wounds were closed under suction drainage. The specimen later underwent regular H&E reporting.



Hooked guide wire for localization of breast lesion



Wire in situ with marking on skin by radiologist



Specimen with guidewire with marking with thread



Sentinel lymph node taken bright blue colour

Result

The average age of patients was 43.86 years, ranging from 26 to 55years.

In 3 patients the lesion was in left breast while in rest 4 the lesion was in right breast.

The lesions were visible by ultrasound in all patients. The average size of the lesion was 7.24 mm in largest diameter, ranging from 4.8 to 13 mm. All lesions were detected by mammography except 2 because of the density of the young breast.

Table-I. USG findings of Breasts (n=7)

Benign	2	28.57%
Suspicious lesion	3	42.86%
Malignant	2	28.57%

Table 2. Mammographic Findings (n=7)

BIRAD 1	2	28.57%
BIRAD 2	1	14.29%
BIRAD 3	1	14.29%
BIRAD 4	2	28.57%
BIRAD 5	1	14.29%

Table 3. USG Guided Core biopsy report (n=5)

Invasive ductal carcinoma	4	80%
Invasive Lobular Carcinoma		
DCIS	1	20%
LCIS		
Suspicious		
Benign		

Table 4. USG guided FNAC Report (n=3)

Malignant		
Suspicious	3	100%
Benign		

Table 5. Frozen Section Report (n=6)

Benign	1	16.67%
Malignant	Margins involved	1 16.67%
	Margins clear	4 66.67%

Table 6. Histopathology Report (n=7)

Invasive Ductal Carcinoma	4	57.14%
Invasive Lobular Carcinoma	1	14.29%
DCIS	1	14.29%
LCIS		
Benign	1	14.29%

According to the grade of the tumor the results were GI in 1 patient, GII in 3 (42.85%) and GIII in 1 patient. The DCIS was of low grade.

Discussion

Mammography detection of non-palpable breast cancer permits earlier diagnosis and almost certainly reduces mortality from the disease^{11,12}. As breast cancer screening with mammography increases, many impalpable breast lesions are being detected. These lesions should first be definitively diagnosed by using image-guided needle biopsy. After the biopsy, some of them require diagnostic or therapeutic surgical biopsy. If malignancy is diagnosed, surgical excision is indicated. This requires accurate localization to ensure correct and adequate removal of the lesion and to minimize the degree of cosmetic disfigurement¹⁹.

Breast lesions that are visible with USG can be adequately localized by several methods including per-operative USG and pre-operative USG guided hook-wire localization. But microcalcifications that are not visible by USG but are well visible by mammography are difficult for needle biopsy and also wire localization. For these lesions stereotactic method has been used for decades²⁰. After needle localization, two

mammographic views are taken in order to provide a road-map to the surgeon for the specimen removal. The radiologist also provide measurements, to aid localization, on the file and marks on the body.¹⁹

Preoperative placement of a hook wire into nonpalpable lesions under imaging guidance is, in privileged counties, commonly performed for patients with suspected findings on mammograms and/or ultrasound for breast cancer.^{19,20} This is a highly technical and technology dependent procedure. In a country with limited resources and facilities we attempted to conserve breast as well as provide adequate treatment to our patients with early detected tumours. We found that this technique is doable in resource constrained settings for small impalpable lesions. Although our group of proven cancers is small, we attempt to compare with those in literature.

In our study the mean age of the patients is 43.86 years. Most of them were in 5th and 6th decades. Sickles reported mean age 57 years old²¹. Basset et al. in study of 207 patients with impalpable lesion inform about mean age of 59 years.²² The data from the previous published studies are different from our study. Our population was small. And in our part of the world breast cancer occurs in younger age²³.

In our study all lesions were visible by ultrasound. Dimitrovska MJ et al showed the lesions are visible in 61.76% by ultrasound and 38.23% lesions are not visible by ultrasound²⁴. As this result is from a country where they have screening programme by mammography and it picks up earlier cancer that are yet to be visible in mammography. In contrast the access to mammogram is very limited for our people and is often sought when symptomatic.

In our study predominant is ductal cancer in 5 patients. Distribution of types of cancer among our group are: invasive ductal carcinoma in 4 cases, invasive lobular carcinoma 1, DCIS in 1 case, while 1 case was benign. In the study of 120 cases, 68(56.6%) were malignant and 52(43.33%) were benign, Ductal carcinoma in situ and microinvasion are in 17.64%²⁴. In 308 cases, Shin et al. reported malignancy in 47% and benign lesions 53%. Ductal carcinoma insitu including microinvasion are in 108(35%).²⁵ The study of 72 impalpable cancers were 39(54%) invasive ductal, 23(32%) noninvasive ductal, lobular carcinoma 4 (6%)²². Other study of 151 cases reported 83(55%) invasive ductal carcinoma, insitu duct cancer 40(26.4%), invasive lobular 5(3.3%)²⁶.

The most dominate grade of breast cancer is intermediate grade 2 tumor^{24,25,26}. Our results are according the literature (42.85%).

Careful communication between radiologist and surgeon appears to be of great importance. We found it particularly helpful for radiologist to relay verbally to the surgeon.

Schwartz et al. emphasis close cooperation between surgeon, radiologist, and pathologist insures that the suspicious area(s) are removed in their entirety with the sacrifice of the minimal amount of contiguous normal breast tissue²⁶.

In an ideal setting there is easy access to digital mammography with stereotactic facilities. But stereotactic device is expensive and can only be used by an expert radiologist. Hence the linear of cluster of microcalcification that can not be picked up ultrasonography can easily be handled²⁰. During the core biopsy from these lesions marker clips are to be ideally put. These clips further helps radiologists to locate the lesion during needle localization. Furthermore, after the excision the specimen is oriented with clips and then specimen imaging is performed to confirm the lesion is excised with atleast 1 cm margin²⁰. Till date, we do not have facilities for stereotactic mammography, marker clips during needle biopsy or specimen imaging. But with these limitations present there, we begin our journey for breast conservation for small impalpable lesions. In this small series the technical constrains did not have detrimental results for the patients.

Conclusion

As we have started the journey for excision of impalpable lesions under wire guidance, under constrained environment, we will eventually overcome our limitations and have all the facilities needed. This will ultimately benefit our patients with breast cancer, the number of which is increasing. The patients will eventually have better cosmesis, bringing improved self-esteem and as well as adequate treatment for cancer.

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