Research Article
Published: 30 Sep, 2019

Journal of Surgery Forecast

Breast Conserving Therapy with Sentinel Lymph Node Biopsy in a Tertiary Care Hospital-Our Experience

Siddiqui K, Tariq S and Abbas T*

Department of surgery, Jinnah Hospital, Lahore, Pakistan

Abstract

Background: Breast Conserving Surgery (BCS) with Sentinel Lymph Node biopsy (SLN) is a standard, safe and preferred therapeutic procedure in early detected breast cancers because it provides the same level of overall survival as mastectomy. Yet in many developing Asian countries including Pakistan this procedure is not popular. We have shared our early experience on a small cohort of patients with encouraging results as well as looked into the reasons surgeons are reluctant to take up this procedure and suggested solutions as well.

Objective: To evaluate outcome of breast conservation therapy with sentinel lymph node biopsy in a tertiary care setting.

Results: Thirty-seven patients underwent breast conserving therapy with sentinel lymph node biopsy over a period of 3 years. Mean age was 32.5 years (range 20-70yrs). 31 patients (83.7%) had symptomatic breast cancer, while 6 patients (16.2%) had screen detected malignancy. Sixteen patients had stage I disease while twenty-one had stage II disease. Among 37 patients with breast cancer, 17(45.9%) were classified as T1 while 20(54.1%) had T2 disease. Twenty-three patients (62.1%) were found to be node positive on frozen section and underwent level 2 auxiliary clearance while fourteen (37.9%) were nodes negative.

Conclusion: Breast conservation surgery is safe, effective and cosmetically superior procedure providing greater patient satisfaction and comparable outcomes.

Keywords: Breast cancer; Breast conservation therapy; Sentinel lymph node sampling

Introduction

According to the figures published by Global Cancer Observatory 2018, breast cancer has the highest age standardized incidence (34.4%) and second highest mortality rate (19.6%) with 911014 (22.3%) newly diagnosed cases reported in Asia. It is probably one of the most researched cancers all over the world with tremendous changes and refinements in every aspect of its treatment witnessed over past few decades. But when it comes to surgical options, we find that unlike Western hemisphere, Breast Conservative Therapy (BCT) is unpopular in Asian countries. In Western countries, BCT rates are often reported to be in excess of 60% (Table 1) [1-4]. This is in contrast to Asian communities where the average reported rates of BCT are considerably lower [5-11]. This discrepancy between BCT *Vs* Mastectomy rates in Western and Asian communities has been attributed to many factors which we will discuss in our study as well as share our own experience of performing BCT with sentinel lymph node biopsy in a small cohort of 37 patients with encouraging results.

Materials and Methods

A study was conducted at Surgical Unit I between Jan 2015 to Dec 2018. Prospective data of 37 patients fulfilling the inclusion criteria (women with stage I and II disease, up to 70 years of age with no contraindications to chest wall irradiation therapy and BCS, and committed to completion of adjuvant therapy were included in the study. The treatment of each patient was tailored according to wishes of the patient and recommendations of tumor board which comprised of specialist surgeon, pathologist, radiologist, medical oncologist and radiotherapist. Detailed multiple counseling sessions were done with patients and their families.

All patients underwent breast conservation surgery. Lumpectomy with 1cm tumor free margin was carried out. For sentinel lymph node biopsy 4-6 ml methylene blue dye was injected in the intra-dermal sub areolar region of the breast having malignancy approximately 4-6 hours before

OPEN ACCESS

***Correspondence:**
Kiran Siddiqui, Department of surgery, Jinnah Hospital, Lahore, Pakistan.
Tel: *+923004825466*
E-mail: *kiransiddiqui85@hotmail.com*

Received Date: *02 Sep 2019*
Accepted Date: *25 Sep 2019*
Published Date: *30 Sep 2019*

Citation: *Siddiqui K, Tariq S, Abbas T. Breast Conserving Therapy with Sentinel Lymph Node Biopsy in a Tertiary Care Hospital-Our Experience. J Surg Forecast. 2019; 2(2): 1024.*

surgery (Figure 1). First 2-4 lymph nodes identified during dissection because of colour staining (Figure 2) were sent for intra operative frozen section analysis along with breast lump to assess margin status (in all patients of BCT to lower re-excision rates).

Successful BCT was defined by pathological clear margins and completion of recommended adjuvant therapy. After completion of treatment, patients were followed up three monthly for first two years and then six monthly. At each follow up detailed history and clinical examination was done along with symptoms directed investigations. Post BCT mammogram was obtained annually after completion of radiotherapy. Women receiving tamoxifen were referred for annual gynecological examinations.

Results

Thirty-seven patients underwent Breast Conserving Therapy with sentinel lymph node biopsy over a period of 3 years. Mean age was 32.5 years (range 20-70 years). Relevant demographic and tumour characteristics are provided in Table 2. Twenty five patients (67.5%) were pre-menopausal, four (10.8%) peri-menopausal and eight (21.6%) were post-menopausal. Thirty-one patients (83.7%) had symptomatic breast cancer and six (16.2%) had screen detected malignancy. All patients had infiltrating ductal carcinoma. Of the thirty seven patients with breast cancer, seventeen (45.9%) were classified as T1 and twenty (54.1 %) as T2. Ten (27%) patients had a grade 3 tumour, nineteen (51.3%) had grade 2 and eight (21.6%) were grade 1. BCT with sentinel lymph nodes biopsy was successfully carried out in all 37 patients with 0% mortality and a median follow-up of 18 months (range 12-36). 2 patients (5.4%) had surgical site infection which was managed conservatively (Table 3).

Discussions

For about three decades, BCT and mastectomy have been considered to provide equivalent survival for women with breast cancer [12]. There is now recent data to suggest that BCT may confer a higher breast cancer-specific survival rate compared with mastectomy [4]. Although the reasons behind this observation have yet to be clearly elucidated, this new information elevates the role of BCT in women with early breast cancer. Thus, a low rate of BCT, as seen in Asian populations, may not offer optimum survival. Most series of surgical treatment of breast cancer in Asian countries report BCT rates lower than 55%. Table 1 lists BCT rates from different regions. Mac Bride *et al.,* has recently published a non-systematic review paper highlighting factors associated with therapy choice [13]. They identified some key factors in literature including role of surgeon, patient's beliefs and access to radiation facility. To this list we will like to add another factor and that is underutilization of available resources. Many tertiary centres and a large number of surgical specialists in our country are underutilizing the procedure of BCT which is considered a resource intense treatment that can only be offered to a small number of patients at centres with high expertise and state of the art facilities.

We faced similar apprehensions but then we decided to make use of what was easily available around us. For sentinel lymph node biopsy, instead of patent blue dye or radioisotopes we used methylene blue which is easily available. To decrease false negative results, we sampled at least 4 lymph nodes in each axilla. A few laboratories have started offering frozen section facilities at subsidized rates and we have been sending our patients on table sentinel lymph node samples and lumpectomy specimens to them. If more and more surgeons start

Figure 1: Blue dye being injected.

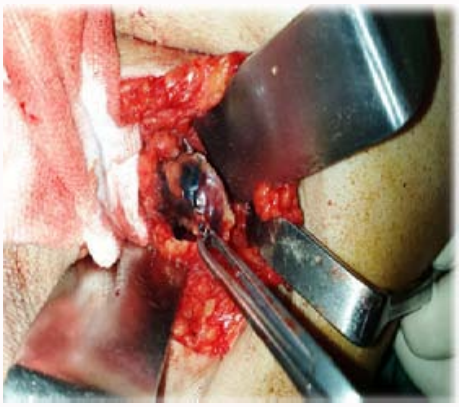

Figure 2: Stained sentinel lymph node.

practicing BCT and utilizing this facility, we are sure that the number of laboratories offering frozen section facilities will increase.

In physician related factors, we found data supporting female gender, higher case number, and training and individual surgeon practices being associated with increased BCT rates [14-19]. Hersmen *et al.,* conducted a large SEER database review with over 56,000 patients; this study looked at the most surgeon-related characteristics. They found increased BCT rates associated with multiple characteristics including being US-trained (OR, 1.12; 95% CI, 1.03-1.22), performing >10 BCT procedures (OR, 1.29, 95% CI, 1.21-1.38), year of graduation after 1975 (OR, 1.16; 95% CI, 1.08-1.25), and the most influential being female gender (OR, 1.40; 95% CI, 1.25-1.55) [14]. A much smaller survey of Colorado women by Cyran *et al.,* also found female physician gender associated with increased BCT rates (OR, 3.8; 95% CI, 1.21-14.4) [19].

When patients are diagnosed with breast cancer they obtain support and advice from multiple sources esp. when making decisions regarding type of breast surgery. The surgeon's recommendations or preference for a particular type of procedure is frequently cited an important factor in this decision-making process. But medical decision-making has evolved over the last several decades from one based on paternalism, in which the physician decided on the best course of treatment according to his/her view of what was in the best interest of the patient, to one focused on patient autonomy, in which the informed patient makes decisions about accepting or declining treatment options based on his/her own values and priorities. In modern medical ethics, shared decision-making has been proposed as the ideal model for medical decision-making that both acknowledges

Table 1: Comparison of published data for BCT rates.

Author	Centre/Country/Study Period	n	Characteristics	%BCT
International/western				
Agarwal *et al., 2014*	SEER database 1998-2008	132 149	Tumour ≤4 cm, ≤3 lymph node +	70%
McGuire *et al., 2009*	Moffitt Cancer Centre, FL, USA (1994-2007)	5865	stage 0-IV	63.70%
Lee *et al*.,	University of Michigan Medical Centre, Michigan, USA (2003-2005)	993	Tis-T4	63%
Garcia-Etienne et al, 2012	EUSOMA (2003-2010)	15,369	Stages 0, I, II (Stages III, T3/T4 excluded)	73.30%
Local				
Chuwa *et al*., 2009	National Cancer Singapore (2002-2003)	767	Symptomatic	28.20%
			Screen detected	45.20%
			Stage 0-IV	31.50%
Wage *et al*., 2011	Changi General Hospital, Singapore (2002-2008)	761	Symptomatic	18.50%
			Screen detected	40.20%
			Stage 0-IV	23.30%
Chang *et al*., 2011	Natonal University Hospital, Singapore (1990-2007)	2449	Stage 0-IV	29.20%
Woon and Chan, 2005	Tan Tock Seng Hospital, Singapore (200-2002)	389	Stage I, IIB (T1-T2)	39.10%
Regional (South Asia/East Asia)				
Yip *et al*., 2009	University of Malaya Medical centre (2001-2005)	953	T1,T2	29.70%
Yau *et al*., 2009	Pamela Y. Nethersole Eastern Hospital, Hong Kong (1994-2007)	2375	T1,T2	30%
Gadgil *et al*.,	Bhabha Atomic Research Centre Hospital, Mumbai (2005-2010)	99	T1-T4	42.20%
Jung *et al*., 2011	Korean Breast Cancer Society databse (2008)	13,908	Stage 0,I	58%
Current Study	MammoCare, Singapore (2009-2011)	116	Symptomatic	81.80%

Table 2: Demographic and clinicopathological profile of subjects.

Variables n= 37	Frequency	Percentages
Age (years) Mean = 32.5		
20-45	21	56.7
46-70	16	43.2
Menstrual status		
Pre-menopausal	25	67.5
Peri-menopausal	4	10.8
Post-menopausal	8	21.6
Mode of Presentation		
Symptomatic tumours	31	83.7
Detected on screening	6	16.2

Table 3: NPI status of patients.

Variables n= 37	Frequency	Percentages
Tumor size at presentation Mean = 3.3cm		
T1	17	45.9
T2	20	54.1
Tumor Grading		
I	8	21.6
II	19	51.3
III	10	27.0
Lymph node as frozen section report		
Positive	23	62.1
Negative	14	37.9

patient autonomy and the role of the physician in providing expert medical opinion [20,21]. This model is particularly suited to treatment decisions in the management of the primary tumour in breast cancer, as the patient may face several surgical treatment options that result in equivalent oncologic outcomes. Now the question arises as how to empower the patient to play a more proactive role in choosing the treatment that best suits them. For this we think adopting a multidisciplinary treatment approach can be very useful.

The use of multidisciplinary treatment teams/tumor boards is becoming quite common in the management of breast cancer patients, especially at larger, academic institutions where breast cancer specialists are available in multiple disciplines. One of the benefits of a multidisciplinary approach is that patients understand all the components of their breast cancer treatment prior to starting treatment, and this increased knowledge may have an impact on treatment decisions regarding surgery for breast cancer. In a study of elderly women aged ≥65 years with local or regional breast cancer treated from 1994 to 1995, those patients who had a consultation with a radiation oncologist preoperatively were 6.7 times more likely to have BCS compared to those who did not ($P \leq 0.001$) [22].

Our unit has been conducting tumor boards regularly for past two years. The board is held fortnightly and all new cases of different malignancies admitted in the ward are discussed thoroughly. The treatment of patients is then tailored according to their wishes and recommendations of board which comprises of specialist surgeon, pathologist, radiologist, medical oncologist and radiotherapist. We strongly recommend that all tertiary care hospitals must establish multidisciplinary boards in their institutions to optimize patient management and satisfaction.

Another important factor related to surgeons is training. All surgeons practicing breast cancer surgery should get trained in breast on co-plastic surgery as well. In modern science women with smaller

volume breasts cannot be denied BCT. For such women, there are many oeuvres that can be applied to achieve higher BCT rates [23-27]. Adjuvant radiotherapy is considered part and parcel of BCT. Treatment requires daily appointments for 4-6 weeks. Potential financial, family and overall life impact may be more for those living far from treatment locations. Both Celaya *et al.,* and Boscoe *et al.,* [28,29] conducted US-based studies that found individuals living farther from radiation treatment centers were less likely to undergo BCT. Celeya *et al.,* found that women living < 20 miles from a radiation treatment facility were at a decreased likelihood of undergoing BCT compared with women living at 20 to 40 miles (OR, 0.65; 95% CI, 0.53-0.79) and > 60 miles (OR, 0.31; 95% CI, 0.15-0.65) [27]. Boscoe *et al.,* reported that the likelihood of mastectomy increased monotonically with increasing distances to both the nearest surgical and radiation treatment centres. For distance to a radiation treatment centre, the highest increase was found at 75 to 100 km (OR, 1.43; 95% CI, 1.23-1.65). Therefore, Limited access to a radiation facility for adjuvant radiotherapy is a major factor inhibiting surgeons performing BCT in a community.

After 40 years of improving, increasing and extending adjuvant breast cancer therapies, there are increasing concerns about overtreatment, with TIME magazine featuring this controversy on their October 2015 front cover. This editorial discusses the rationale and design of a new study, Primetime, which investigates the omission of radiotherapy after Breast-Conserving Surgery (BCS) in patients at very low risk of recurrence by using biomarkers. It is expected IHC4+C will prove an effective yet inexpensive method for risk stratification that can be adopted as part of standard of care [30].

Till such time when this revolutionary treatment guideline can be adopted, we could facilitate patients receiving radiotherapy by administering Accelerated Partial Breast Irradiation (APBI) instead of Whole Breast Irradiation (WBI). Recent data published by Strnad *et al.,* clearly demonstrates the non-inferiority of partial irradiation approach over whole breast irradiation [31]. One of the main benefits of APBI is that it reduces total treatment time from 3-6 weeks to less than a week which improves patient's satisfaction, overall quality of life, decreases toxicity to surrounding organs and tissues. APBI is also more cost effective [32].

Meta-analysis of various studies has shown that overall main themes influencing women's choice of mastectomy were; mastectomy being more reassuring options, avoiding radiation and more expedient treatment. The main themes influencing women choice of BCT were; body image concerns and feminity, physician recommendations, long term survival being equivalent and less surgery being involved. Schou *et al.,* found individuals rating 'fear of cancer recurrence' highly correlated with choice of mastectomy (rs=0.43; *P*=0) [33]. Both Temple *et al.,* (*P*=.001) [17] and Molenaar *et al.,* (*P*<.001) [34] found that women who underwent mastectomy rated fear of cancer recurrence significantly higher compared with women who underwent BCT. Lee *et al.*, found those rating 'removing your entire breast to gain peace of mind' were significantly more likely to undergo mastectomy as well (OR, 1.88; 95% CI, 1.60-2.20) [35]. In a qualitative study, Caldon *et al.,* reported 'most reassuring treatment' as the primary reason women chose mastectomy, further stating that 'many choosing mastectomy said this option reduced their anxiety about the completeness of cancer excision [36].

Conclusion

We have shared our initial experience of BCT with sentinel lymph node biopsy in a tertiary care hospital on a small cohort of patients with encouraging results. We have also highlighted and discussed the plausible contributing factors which are responsible for relatively lower rates of BCT *vs* mastectomy in our community and how we overcame those hurdles by making the best use of resources available in our setup.

References

1. Lee MC, Rogers K, Griffin K, Diehl KA, Breslin TM, Cimmino VM, *et al.* Determinants of breast conservation rates: reasons for mastectomy at a comprehensive cancer centre. Breast J. 2009; 15: 34-40.
2. McGuire KP, Santillan AA, Kaur P, Meade T, Parbhoo J, Mathias M, *et al.* Are mastectomies on the rise? A 13-year trend analysis of the selection of mastectomy versus breast conservation therapy in 5865 patients. Ann Surg Oncol. 2009; 16: 2683-2690.
3. Garcia-Etienne CA, Tomatis M, Heil J, Friedrichs K, Kreienberg R, Denk A, *et al.* Mastectomy trends for early-stage breast cancer: a report from the EUSOMA multi-institutional European database. Eur J Cancer. 2012; 48: 1947-1956.
4. Agarwal S, Pappas L, Neumayer L, Kokeny K, Agarwal J. Effect of breast conservation therapy *vs* mastectomy on disease-specific survival for early-stage breast cancer. JAMA Surg. 2014; 149: 267-274.
5. Chuwa EW, Yeo AW, Koong HN, Wong CY, Yong WS, Tan PH, *et al.* Early detection of breast cancer through population-based mammographic screening in Asian women: a comparison study between screen detected and symptomatic breast cancer. Breast J. 2009; 15: 133-139.
6. Yau TK, Soong IS, Sze H, Choi CW, Yeung MW, Ng WT, *et al.* Trends and patterns of breast conservation treatment in Hong Kong: 1994-2007. Int J Radiat Oncol Biol Phys. 2009; 74: 98-103.
7. Yip CH, Taib NA, Tan GH, Ng KL, Yoong BK, Choo WY, *et al.* Predictors of axillary lymph node metastases in breast cancer: is there a role for minimal axillary surgery? World J Surg. 2009; 33: 54-57.
8. Chang GH, Chan CW, Hartman M. A commentary on delayed presentation of breast cancer in Singapore. Asian Pac J Cancer Prev. 2011; 12: 1635-1639.
9. Jung YS, Na KY, Kim KS, Ahn SH, Lee SJ, Park HK. Nation-wide Korean breast cancer data from 2008 using breast cancer registration program. J Breast Cancer. 2011; 14: 229-2236.
10. Wang WV, Tan SM, Chow WL. The impact of mammographic breast cancer screening in Singapore: a comparison between screen-detected and symptomatic women. Asian Pac J Cancer Prev. 2011; 12: 2735-2740.
11. Gadgil A, Roy N, Sankaranarayanan R, Muwonge R, Sauvaget C. Effect of comprehensive breast care on breast cancer outcomes: a community hospital based study from Mumbai. Asian Pac J Cancer Prev. 2012; 13: 1105-1109.
12. Mc Laughlin SA. Surgical management of the breast: Breast conservation therapy and mastectomy. Surg Clin North Am. 2013; 93: 411-428.
13. Mac Bride MB, Neal L, Dilaveri CA, Sandhu NP, Hieken TJ, Ghosh K, *et al.* Factors associated with surgical decision making in women with early-stage breast cancer: a literature review. J Womens Health (Larchmt). 2013; 22: 236-242.
14. Hershman DL, Buono D, Jacobson JS, McBride RB, Tsai WY, Joseph KA, *et al.* Surgeon characteristics and use of breast conservation surgery in women with early stage breast cancer. Ann Surg. 2009; 249: 828-833.
15. Chagpar AB, Studts JL, Scoggins CR, Robert CG, Carlson DJ, Laidley AL, *et al.* Factors associated with surgical options for breast carcinoma. Cancer. 2006; 106: 1462-1466.
16. Benedict S, Cole DJ, Baron L, Baron P. Factors influencing choice between mastectomy and lumpectomy for women in the Carolinas. J Surg Oncol.

2001; 76: 6-12.

17. Temple WJ1, Russell ML, Parsons LL, Huber SM, Jones CA, Bankes J, *et al*. Conservation surgery for breast cancer as the preferred choice: a prospective analysis. J Clin Oncol. 2006; 24: 3367-3373.

18. Menzel C, Dixon JM. Predictors of mastectomy in a certified breast center-the surgeon is an independent risk factor. Breast J. 2008; 24: 324-323.

19. Cyran EM, Crane LA, Palmer L. Physician sex and other factors associated with type of breast cancer surgery in older women. Arch Surg. 2001; 136: 185-191.

20. Politi MC, Studts JL, Hayslip JW. Shared decision making in oncology practice: what do oncologists need to know? Oncologist. 2012; 17: 91-100.

21. Pope TM, Hexum M. Legal briefing: shared decision making and patient decision aids. J Clin Ethics. 2013; 24: 70-80.

22. Baldwin LM, Taplin SH, Friedman H, Moe R. Access to multidisciplinary cancer care: is it linked to the use of breast-conserving surgery with radiation for early-stage breast carcinoma? Cancer. 2004; 100: 701-709.

23. Tan MP. The boomerang incision for periareolar breast malignancies. Am J Surg. 2007; 194: 690-693.

24. Tan MP. An algorithm for the integration of breast magnetic resonance imaging into clinical practice. Am J Surg. 2009; 197: 691-693.

25. Tan MP. Areola-sparing techniques for breast malignancies with nipple discharge. J Am Coll Surg. 2009; 208: 1-6.

26. Tan M. The 'golf-tee' incision for lower mid-pole peri-areolar cancers. Ann R Coll Surg Engl. 2010; 92: 438-439.

27. Tan MP. Alternative approaches for oncoplastic breast surgery. Ann Surg Oncol. 2012; 19: 2327-2333.

28. Celaya MO, Rees JR, Gibson JJ, Riddle BL, Greenberg ER. Travel distance and season of diagnosis affect treatment choices for women with early-stage breast cancer in a predominantly rural population (United States). Cancer Causes Control. 2006; 17: 851-856.

29. Boscoe FP, Johnson CJ, Henry KA, Goldberg DW, Shahabi K, Elkin EB, *et al*. Geographic proximity to treatment for early stage breast cancer and likelihood of mastectomy. Breast. 2011; 20: 324-328.

30. Kirwan CC, Coles CE, Bliss J. It's PRIMETIME. Postoperative Avoidance of Radiotherapy: Biomarker Selection of Women at Very Low Risk of Local Recurrence. Clinical Oncology. 2016; 28: 594-596.

31. Strnad V, Ott OJ, Hildebrandt G, Kauer-Dorner D, Knauerhase H, Major T, *et al*. 5-year results of accelerated partial breast irradiation using sole interstitial multicatheter brachytherapy versus whole-breast irradiation with boost after breast conserving surgery for low-risk invasive and in-situ carcinoma of the female breast: a randomised, phase 3, non-inferiority trial. Lancet. 2016; 387: 229-238.

32. Harat A, Harat M, Makarewicz R. Whole breast irradiation *vs.* APBI using multicatheter brachytherapy in early breast cancer-simulation of treatment costs based on phase 3 trial data. J Contemp Brachytherapy. 2016; 8: 505-551.

33. Schou I, Ekeberg O, Ruland CM, Karesen R. Do women newly diagnosed with breast cancer and consulting surgeon assess decision-making equally? Breast. 2002; 11: 434-441.

34. Molenaar S, Oort F, Sprangers M, Rutgers E, Luiten E, Mulder J, *et al*. Predictors of patients' choices for breast- conserving therapy or mastectomy: a prospective study. Br J Cancer. 2004; 90: 2123-2130.

35. Lee CN, Chang Y, Adimorah N, Belkora JK, Moy B, Partridge AH, *et al*. Decision making about surgery for early-stage breast cancer. J Am Coll Surg. 2012; 214: 1-10.

36. LJM Caldon, KA Collins, DJ Wilde, SH Ahmedzai, TW Noble, A Stotter, *et al*. Why do hospital mastectomy rates vary? Differences in the decision-making experiences of women with breast cancer. Br J Cancer. 2011; 104: 1551-1557.