Optimizing Results of Breast Cancer Surgery: A 8 Yrs' Experience

Arnab Gupta · Samir Bhattacharya · A. Bhowmick ·
Dipanjan Dey · S. Goswami

Received: 13 March 2010 / Accepted: 14 August 2010 / Published online: 5 April 2011
© Indian Association of Surgical Oncology 2011

Abstract Management of breast cancer in developing country, in contrast to Western countries, is challenging considering more number of advanced cases and poor understanding of the disease and its management by the population and even many physicians. We tried to look prospectively at our experience with breast cancers, trying to optimize the results given the wide- variety of cases we see.

Keywords Breast cancer · Surgery · Mastectomy · BCS · Oncoplastic · Morbidity

Introduction

Breast cancer is the commonest cancer in the women and second commonest cancer world-wide. Over the decades, a shift towards earlier stage at presentation is noticed in the west [1]. As cancer-related survival is increasing, effective prevention and management of post-treatment sequelae that impair function and compromise quality are assuming greater importance. In India, we see more of Stage III and IV Breast Cancers [2] in contrast to Western countries, where half of the cases are screen detected or in Stage I. Surgical approaches to our set of patients have to be tailored according to the stage at presentation, their place of residence (distance from the care-giving centre), socio-economic status, the age and psychology of the patients etc. Our set of patients often has extensive nodal disease where axillary dissection can be challenging. Extensive axillary

nodal dissection can lead to morbidities like lymphoedema, seroma, shoulder stiffness, pain, numbness and paraesthesia in the ipsilateral upper arm.

Aim

The aim was to do a prospective study looking at the results of our specially designed customized surgeries and adjuvant treatment for this extremely variable group and develop an evidence based medicine for Eastern India. The end point was to see whether we could reduce morbidity of axillary dissection in most of these advanced diseases without compromising on local control. Also we wanted to see whether Breast Conservation was a valid option for low socio-economic status where the adjuvant Radiotherapy could only be in the form of Tele- cobalt therapy rather than the standard recommendations of Electron beam Radiotherapy with Linear Accelerator or Interstitial Brachytherapy for the affordability issue.

Material & Methods

Meticulous records were maintained of all the patients who underwent Breast Cancer Surgery in a single unit from April, 2001, and the data were tabulated up to March, 2009. The full profile of the patients, stage at presentation, surgery offered (MRM- Modified Radical Mastectomy/ BCS- Breast Conservation surgery), structures preserved during axillary dissection, operative time, histopathology, complications, type of Radiotherapy and chemotherapy used as adjuvants, shoulder movements, lymphoedema, numbness and pain in the axilla and arm, wasting of Anterior axillary fold, recurrences and survival were noted.

A. Gupta (✉) · S. Bhattacharya · A. Bhowmick · D. Dey ·
S. Goswami
Department of Surgical Oncology & Radiation Oncology,
Cancer Centre Welfare Home & Research Institute,
Thakurpukur, Kolkata
e-mail: arnabgupta1@hotmail.com

Level III axillary clearance was routinely done on all patients of Stage II and III without subjecting them to axillary radiotherapy as from our previous experience, combination of Axillary dissection and local axillary radiation increases the risk of Lymphoedema significantly. With this study we wanted to see whether omitting Axillary radiation even in the presence of locally advanced disease where extra-capsular spread and extensive nodal burden (common indications of axillary radiation) do not actually lead to increased axillary recurrence and whether its omission actually decrease the risk of Lymphoedema Fig. 1.

Attempts were made to preserve Pectoralis minor muscle, Latissimus dorsi (LD) pedicle, Nerve to Serratus anterior (SA), Intercosto Brachial nerve and Medial Pectoral vessels and nerve during axillary dissection. Pectoralis minor muscle was not divided but retracted medially and the arm was abducted and externally rotated by the assistant in all cases to get good access to Level III lymphnodes.

Sharp axillary dissection was done by scissors and the lymphatics were cauterized by coagulation mode. Axillary tail of the breast was routinely removed in all BCS cases apart from all MRM cases as they are known to contain intra-parenchymal nodes. 1.5 cm margin was aimed at in all BCS cases and no Frozen section/Imprint cytology was done for the margins. The defect after Wide Local Excision (WLE) initially in the 1st 10 cases of BCS was allowed to fill up with seroma after early removal of drain within 48 h. The remaining cases had local flaps by mobilizing the breast parenchyma or mini-LD flap (Oncoplastic Breast surgery). Active exercises of arms were started from the 1st post-operative day under the supervision of Breast Cancer

support group. Axillary suction drains were removed once the drainage was less than 30 ml on 2 consecutive days. All the patients were placed in Multi-disciplinary meets to plan the adjuvant treatment. Irrespective of the extent of nodal disease, none of the patients were subjected to Axillary or Internal Mammary radiation post-operatively. Telecobalt or External electron beam radiotherapy (RT) was given as adjunct after Breast Conservation Surgery (BCS) and in some cases of Modified Radical Mastectomies (MRM) with an average dose of 45 Gy to the breast/chest wall and another 15 Gy to the tumour bed as boost in case of BCS. Radiation of 15 Gy to the Supra-clavicular area was given in addition to the patients who had 4 or more positive axillary lymph-nodes. All our patients, having tumour size more than 1 cm, received adjuvant chemotherapy. Hormonal therapy was given to those who were ER, PR positive. None of our patients could afford Trastuzumab and were not considered in any patient even if they were Her 2neu strongly positive on FISH. In the follow up, mid arm and wrist circumferences were measured on both sides and the movements of the arms were measured by goniometer. Sensation in the arms (by fine and crude touch) were tested and recorded in all cases.

Results

216 patients (214 female, 2 male patients) underwent surgeries in this single unit in this 7 yrs' time period, of which 165 (77.1%) were MRM, 49 (22.8%) were BCS and 2 Toilet Mastectomies. The average age of the patient was 42 yrs (ranging from 26 to 78 yrs). We had only 1 patient in Stage I disease, 62 (28.9%) in Stage II, 151 (69.9%) patients in Stage III and 2 in Stage IV. The one in Stage I disease had a sentinel node biopsy with blue dye followed by completion clearance and the ones in stage II and Stage III had Level III axillary clearance.

Structures Preserved

Out of all the 214 patients who had axillary clearance, Pectoralis minor could be saved in 212 (99%) patients, LD pedicle in 213 (99.5%) patients, Nerve to Serratus anterior in 211 (98.5%), Medial Pectoral vessels and nerve in 180 (84.1%) and Intercosto-brachial nerve in 159 (74.2%) patients. The average operative time for 1st 4 yrs was 1 h 55 min and in last 4 yrs it had come down to 1 h 20 min.

BCS

Out of the 49 patients who underwent BCS, 1 presented in Stage I, 38 presented in Stage II (79.6%) and 10 in Stage III.

Fig. 1 Structures preserved during our axillary dissection

17 (34.6%) had previous unplanned lumpectomies with inadequate/unknown margins. 23 (46.9%) came from low Socio-economic status, and 13 (26.5%) were from remote areas but were motivated for BCS and close follow up. All these 23 patients could not afford adjuvant Radiotherapy with External Electron Beam Radiation and were treated with conventional Telecobalt therapy. Out of 214 patients, 3 patients underwent Mini-LD flap as a part of BCS and 1 patient underwent TRAM flap after MRM. None of the BCS patients had margin positivity (all had an average of 1 cm tumour free margin). The 1st 10 cases of BCS developed puckering and deformity after Radiotherapy for fibrosis. The other 39 BCS who had Oncoplastic breast surgery with breast parenchymal Lateral Tissue flaps (TLF)/Mini LD flaps had no such deformity Fig. 2.

Axillary Morbidity

Average time of Axillary drain removal was 7.5 days (4–21 days). The drains were only removed if the drainage was less than 30 ml for 2 consecutive days. Only 1 patient had local infection which resolved with conservative treatment. This patient developed infection 2 wks after removal of the drain. Only 6 (2.8%) patients had recurrent seroma needing

Fig. 2 Some of our patients after Oncoplastic breast surgery

aspiration on more than 2 occasions. 43 (22.7%) patients had long term numbness/paraesthesia in upper ipsilateral arm and all were related to sacrifice of Intercostobrachial nerves. None of the patients had long term shoulder dysfunction. Minor Lymphoedema of arm was seen in 4 patients and 2 had significant lymphoedema (>2 cms difference in circumference of mid arm). Both of them were treated outside with Radiation which included the axilla. All the patients who had Medial Pectoral vessels and nerve had absence of atrophy of the anterior axillary fold, with consequently better cosmesis especially in BCS patients.

Recurrences

Only 1 patient (2.7%) had local recurrence after BCT (had previously received adjuvant with Electron beam radiation). She was a young lady of 32 yrs who had T2, N0 M0 sub-areolar lesion and had partial subcutaneous mastectomy, sacrificing the nipple- areolar complex and mini-LD flap for the defect. She had a minimum tumour free margin of 2 cms and her receptor study showed it was ER, PR and Her2 neu negative. 3 patients of BCS had distant metastasis without local recurrence. 3 patients had recurrence in the scar after MRM and 12 (5.6%) had distant metastasis, all in Stage III disease. None of the 214 patients who had Level III axillary clearance had local axillary recurrence, although no radiation was given to the axilla (apart from the 2 cases who received radiation outside which involved radiation to axilla as well), even in the presence of extra-capsular invasion.

Discussion

Axillary dissection has been an integral part of surgical treatment of breast cancer since the days of Halsted. It is considered as providing the best prognostic information as well as very good local control and in planning of adjuvant treatment [3]. NSABP 04 study clearly showed that 40% of clinically non-palpable axillary nodes do actually have axillary nodal metastasis on histology, and if only simple mastectomy had been done followed by adjuvant chemotherapy, there is 18% chance of recurrence in the axilla. With ALND, axillary recurrence is low 0–2% [4]. It is nevertheless associated with significant morbidity such as seroma, arm edema, shoulder pain, neuropathy, impairment of shoulder movement etc. [5].

Seroma has been variously reported as occurring in 3–85% of patients undergoing ALND for breast cancer [6]. Though the etiology of the development of seroma in post-operative seroma formation remains doubtful, it occurs with almost equal frequency in mastectomy and BCS. In the present

study, the incidence of significant seroma formation needing intervention is 2.8%, which is in accordance with the lower range of reported occurrence.

Surgical site infection (SSI) has been reported to occur in 4.4% of breast cancers treated with surgery [6]. In many instances, it is associated with seroma formation, but it can occur independent of it. In the present series, 1 patient (0.04%) had SSI which was not associated with seroma formation.

Lymphoedema is the most common and troublesome morbidity related to breast cancer surgery. It is aggravated by axillary irradiation. It occurs in 19–25% of patients undergoing surgery alone [7] which goes upto 38% following axillary irradiation [8]. The ALMANAC trial showed that sentinel node biopsy caused less incidence of lymphedema than ALND [9]. In the present series, 4 out of 216 patients (1.8%) had significant lymphoedema. Major lymphoedema occurred in half of them, both in patients who had RT to axilla in outside centres.

Conclusions from Our Series

1. Level III axillary clearance without Radiation to the axilla even in advanced disease is safe and avoids lymphoedema and shoulder dysfunction. Several studies have confirmed that combination of Axillary dissection and radiotherapy can increase the incidence of Lymphoedema significantly upto the tune of 40%. Whenever an incomplete dissection of the axilla is done in locally advanced disease, it has to be backed up with local radiotherapy. This combination should be avoided at all costs not only for the high risk of lymphoedema but also for shoulder dysfunction.
2. Preservations of Intercostobrachial nerves, Medial Pectoral vessels & nerve are possible in more than 70% cases even in advanced disease, without compromising with the local control.
3. Division of Intercostobrachial nerve is associated with numbness/paraesthesia of arm which can be a major long-standing morbidity while division of Medial Pectoral vessels and nerve are associated with atrophy of the anterior axillary fold, which can be cosmetically unsightly especially after BCS. No studies have been done so far to look at the role of preservation of Medial Pectoral vessels and nerve.
4. Doing BCS after previous unplanned lumpectomies is safe.
5. Oncoplastic breast surgery should be performed in BCS to avoid deformity from fibrosis after Radiation.
6. Telecobalt in place of External Electron beam radiation/ Interstitial brachytherapy is feasible and safe as adjuvant after BCS, and may be an option in patients of low socio-economic status.
7. Patients from low socio-economic status and from remote areas should not be an absolute contra-indication to BCS. They may be motivated for full adjuvant treatment and close follow up if counseled properly.
8. Incidence of seroma can be minimized by good surgical technique. Use of electro-cautery selectively for the lymphatics have proved to be effective, although some studies have shown increased incidence of seroma and may be to do with excessive rather than selective use of electro-cautery. Leaving the drains till they are draining minimally (<30 ml) for 2 consecutive days do not cause increased rate of infection even after 2–3 wks, without extending the standard 5 days' course of antibiotics. Obesity, diabetes, hypertension and Hypothyroidism, especially in combination, may cause increased lymphorrhoea as seen in our series, and the drains have to be left longer than usual.
9. Absence of shoulder dysfunction in all but 2 cases, where the patients had Radiation outside which included the axilla and consequently had significant lymphoedema, suggest that avoiding radiation after ALND is a single most important factor in avoiding shoulder dysfunction and lymphoedema of the arm.
10. The fact that none of our patients had close/positive margin after BCS may suggest that aiming for a surgical margin of 1.5 cms, rather than a standard recommendation of 1 cms, may be safe to avoid a repeat surgery/recurrence in our set of patients most of whom are of low socio-economic status and would definitely would not want a repeat surgery/recurrence after BCS.
11. Lateral Tissue flaps/Mini LD flaps should be considered for better long term cosmesis after BCS. Radiation fibrosis with puckering can be otherwise quite unsightly especially for large defects.

References

1. Erickson VS, Pearson ML, Gauz PA et al (2001) Arm edema in breast cancer patients. *J Natl Cancer Inst* 93:96–111
2. Deo SV, Samaiya A, Shukla NK, Mohanti BK et al (2005) Breast conservation therapy for breast cancer: patient profile and treatment outcome at a tertiary care cancer centre. *Natl Med J India* 18 (4):178–181
3. Samphao S, Eremin JE, El-Sheeny M et al (2008) Management of the axilla in women with breast cancer: current clinical practice and a new selective targeted approach. *Ann Surg Oncol* 15(5):1282–96

4. Fisher B, Wolmark N, Metal B (1981) The accuracy of clinical nodal staging and of limited axillary dissection as a determinant of histologic nodal status in carcinoma of the breast. *Surg Gynaecol Obstet* 152:765–72
5. Hack TF, Cohen L, Katz J et al (1999) Physical and psychological morbidity after axillary lymph node dissection for breast cancer. *J Clin Oncol* 17:143–149
6. Bookstrom SY, Tuvockmorton A, Boughey JC et al (2008) Incidence of clinically significant seroma after breast and axillary surgery. *J Am Coll Surg* 208:148–150
7. Maunsell E, Brisson J, Deschenes L (1993) Arm problems and psychological distress after surgery for breast cancer. *Can J Surg* 36:315–320
8. Kissin MW, Quercidella Rovere G (1986) Risk of lymphoedema following the treatment of breast cancer. *Br J Surg* 73:580–4
9. Mansell RE, Fallowfield L, Kissin M et al (2006) Randomised multicentric trial of sentinel node biopsy versus standard axillary treatment in operable breast cancer: the ALMANAC trial. *J Nat Cancer Inst* 98:599–609