Adjuvant Radiotherapy after Skin Sparing Mastectomy with Immediate Autologous Breast Reconstruction

Article *in* Journal of Cancer Science & Therapy · January 2017

DOI: 10.4172/1948-5956.1000459

4 authors:

Shimaa Ahmed
Mansoura University
4 PUBLICATIONS **8** CITATIONS
SEE PROFILE

Hamza Abbas
Assiut University
25 PUBLICATIONS **82** CITATIONS
SEE PROFILE

Khalid Rezk
Assiut University
10 PUBLICATIONS **98** CITATIONS
SEE PROFILE

Adel Gabr
South Egypt Cancer Institute
20 PUBLICATIONS **69** CITATIONS
SEE PROFILE

Journal of
Cancer Science & Therapy

Ahmed et al., J Cancer Sci Ther 2017, 9:5
DOI: 10.4172/1948-5956.1000459

Research Article OMICS International

Adjuvant Radiotherapy after Skin Sparing Mastectomy with Immediate Autologous Breast Reconstruction

Shimaa Ahmed[1], Hamza Abbas[1]*, Khalid Rezk[2], and Adel Gabr[3] and Maha Elnaggar[4]

[1]*Radiotherapy Department, South Egypt Cancer Institute, Assiut University, Egypt*
[2]*Surgical Department, South Egypt Cancer Institute, Assiut University, Egypt*
[3]*Medical Oncology Department, South Egypt Cancer Institute, Assiut University, Egypt*
[4]*Clinical Oncology department - Faculty of Medicine Assiut University, Egypt*

Abstract

Introduction: Skin sparing mastectomy with immediate autologous breast reconstruction has a positive psycho-social and sexual effect, however postoperative radiotherapy could adversely affect its cosmetic results.

Patients and methods: This study included 24 female breast cancer patients underwent skin sparing mastectomy with or without scarifying NAC and immediate reconstruction by autologous TRAM and latissimus dorsi myocutaneous flap. They received adjuvant chemotherapy followed by 3DCRT, we evaluated them for skin complications and cosmoses.

Results: Faint erythema or dry desquamation detected in 16 patients (66.6%), while 8 patients (29.2%) had moderate to brisk erythema. Two patients (8.3%) had skin edema and one patient (4.2%) had telangiectasia. Two patients complained from moderate pain Fat necrosis within the flap detected only in one patient (4.2%). Twenty-two patients (83.3%) had acceptable cosmoses while 2 patients had unsatisfactory cosmetic results.

Conclusion: Postoperative radiotherapy is safe with acceptable rate of complications and very good patients satisfactions after skin sparing mastectomy and immediate autologous breast reconstruction.

Keywords: Skin sparing; Immediate autologous reconstruction; Post-operative; Radiotherapy; Breast cancer

Introduction

Breast reconstruction has a positive psycho-social and sexual effect in the management of breast cancer patients, and immediate breast reconstruction does not compromise its oncologic safety, with comparable local control rates, and no delays in the initiation of adjuvant therapy [1]. Skin sparing mastectomy (SSM) improved outcomes of immediate breast reconstruction as natural skin envelope is preserved [2]. Nipple areola complex usually scarified however it can be spared, in carefully selected patients [3], using the same principle of SSM to the preserve the nipple; nipple-sparing mastectomy (NSM). The probability risk for local and regional recurrence after SSM is equivalent to standard mastectomy [3]. NSM do not affect locoregional control as 5 years local recurrence reported in 3% to 6% of patients similar to modified radical mastectomy [4], and it has promising cosmetic results [5] have significantly greater cosmetic satisfaction compared to SSM [6]. Immediate transverse rectus abdominis myocutaneous (TRAM) flap reconstruction does not compromise long term clinical outcomes in breast cancer patients requiring postmastectomy radiation therapy (PMRT) [7]. There is no standard for postoperative radiotherapy following SSM and NSM, however it proved to improve local control and had acceptable cosmetic results [8]. Incidence of nipple necrosis after postoperative radiotherapy was 5%, which is comparable to rates with surgery alone as reported by some series [6].

Conflicted data is present regarded the use of immediate autologous breast reconstruction followed by PMRT adversely affect the cosmetic results because of high rate of complications as fat necrosis and volume loss [1]. Train et al. recommended delayed rather than immediate autologous reconstruction when adjuvant postoperative radiotherapy is decided [9], however their study was retrospective and their patients treated with old radiotherapy techniques made applying their recommendation unsuitable when using modern radiation therapy. The aim of this study was to evaluate skin toxicities and cosmetic outcome of radiotherapy after skin sparing mastectomy with immediate autologous breast reconstruction.

Patients and Methods

This prospective study included 24 female breast cancer patients underwent skin sparing mastectomy and immediate breast reconstruction surgery followed by adjuvant radiation therapy.

Patients eligible if they are: Histologically confirmed invasive breast cancer; Age ≥ 18 years; ECOG performance status ≤ 2; Negative histological margins; Non-metastatic, and adjuvant radiation therapy is indicated.

Patients not eligible if they have: Prior radiotherapy for the current breast cancer; Pregnancy; Other malignancy within the past 5 years except for non-melanoma skin cancer. Trastuzumab and hormonal therapy allowed during radiotherapy.

Surgery

Patients underwent skin sparing mastectomy with or without scarifying NAC and immediate reconstruction by autologous TRAM and/or latissimus dorsi myocutaneous flap.

Systemic Therapy

Patient received adjuvant anthracycline bases chemotherapy while

***Corresponding author:** Hamza Abbas, Radiotherapy Department, South Egypt Cancer Institute, Assiut University, Egypt, Tel: 0020882185700; Fax: 0020882348609; E-mail: hamza_assiut@yahoo.com

Received December 30, 2016; **Accepted** May 22, 2017; **Published** May 26, 2017

Citation: Ahmed S, Abbas H, Rezk K, Gabr A (2017) Adjuvant Radiotherapy after Skin Sparing Mastectomy with Immediate Autologous Breast Reconstruction. J Cancer Sci Ther 9: 460-462. doi: 10.4172/1948-5956.1000459

we add taxane chemotherapy when HER2 over expressed joint with node positive.

Trastuzumab delivered on 4 patients out of 8 patients had overexpressed HER2.

Radiotherapy

All patient included received 3-dimenssional radiation therapy with total dose of 50 Gy using 2 Gy per fraction prescribed at isocenter point. If the patient has lymph node metastasis, we irradiate supra-clavicular and infra-clavicular lymph node regions per RTOG atlas contouring. Incomplete evacuation is the only sign for axillary irradiation, while no attempted to irradiate internal mammary nodes unless involved. We generated a complete 3D plan considering the ICRU 50 recommendations using wedges and asymmetric open field in field [10] to verify these recommendations.

Re-Evaluation

During radiotherapy and one week after, by clinical examination every week for skin complications and treatment interruptions then patients were re-evaluated every 3 months, for complications, for at least two years.

Acute skin reactions were categorized per radiation therapy oncology group (RTOG) acute radiation skin morbidity scoring criteria [11]. Chronic skin and subcutaneous radiation complications were scored using the RTOG/European organization for research and treatment of cancer (EORTC) Late Radiation Morbidity Scoring Scheme [12].

Results

Our analysis included only 24 patients in whom postoperative radiotherapy is indicated [24 out of 36 total number of patients underwent SSM as 12 patients did not receive PORT either DCIS (7 patients) or T1-2, N0 (5 patients)] these patients underwent skin sparing mastectomy with immediate reconstruction by autologous TRAM and/or latissimus dorsi myocutaneous flap. Patient characteristics represented in Table 1.

Surgery

Twenty-four patients underwent skin sparing mastectomy (17 without nipple sparing and 7 with nipple sparing) and immediate reconstruction by either TRAM or latissimus dorsi flap.

Immediate postoperative complications: seven patients developed partial flap loss and 7 patients had donor site gaped wound and two had seromas.

Chemotherapy

All patient received chemotherapy including anthracycline [8 patients received FAC and 8 received FEC]; while 8 patients added Taxens as they had over expression HER2 [3 patients FEC-Docetaxel and 5 received AC-T].

Hormonal therapy started during radiation in 19 patients having positive hormonal therapy.

Radiation Therapy

After finishing their chemotherapy by 2 weeks we started radiotherapy planning aiming radiation delivered on the 3rd week after chemotherapy.

Characteristics		No
Age range 35-57		
Tumor size	pT1	7
	pT2	16
	pT3	1
Lymph nodes	pN0	1
	pN1	5
	pN2	12
	N3	4
Grade	G1	0
	G2	22
	G3	2
Her 2	Positive	8
	Negative	16
Hormonal receptor	Positive	19
	Negative	5

Table 1: Patients' characteristics.

Satisfaction	Excellent	Good	Fair	No
6 Months	15	5	2	2
12 Months	15	5	2	2
18 Months	13	6	3	2
24 Months	12	6	4	2

Table 2: Chronic skin toxicities.

Toxicities	Grade 1	Grade 2	Grade 3
Skin edema	**2**	**0**	**0**
Telangiectasia	**1**	**0**	**0**
Radiation recall	**0**	**0**	**0**
Rib fracture	**0**	**0**	**0**

Table 3: Patient's cosmetic satisfaction.

Pain	No or Mild	Moderate
6 Months	22	2
12 Months	22	2
18 Months	21	3
24 Months	21	3

Table 4: Patients' pain complaint.

All patient received supra-clavicular and infra-clavicular nodal irradiation except one patient because of nodal negative, and none of them received axillary nor internal mammary irradiation.

Acute radiation toxicities evaluated weekly during radiotherapy till 3 months after radiation, faint erythema or dry desquamation as greatest skin reaction reported in in 16 patients (66.6%), while moderate to brisk erythema reported in 8 patients (29.2%); desquamation, mostly confined to skin folds and creases; we did not report any higher toxicities. All patients completed their radiation course without interruption.

We studied different factors that could affect incidence of acute skin toxicities as age, stage, laterality, and hormonal therapy all had no significant effects.

We evaluated late skin toxicities per RTOG grading system with 2 years' median follow up, only grade I chronic skin toxicities were present as 2 patients (8.3%) had skin edema and one patient (4.2%) had telangiectasia, no radiation recall toxicities (Table 2). Fat necrosis within the flap reported only in one patient (4.2%).

Twenty-two patients (83.3%) had acceptable cosmoses, where 2

patients had un-satisfactory cosmetic results and need re-surgery, one of them had diabetes milletus (Table 3). Moderate pain reported only in 2 patients while 22 patients had no pain (Table 4). With median 2-year follow up, none of our patients developed local recurrence.

Discussion

SSM and NSM are oncologically safe with low rate of recurrence ranging from 0% to 4% in case of NSM [13]. The indications of PMRT cannot decided except after postoperative pathology evaluation and we have limited ability to predict the extent of axillary lymph node involvement preoperatively.

Several studies have evaluated the outcomes of breast reconstructions that were performed before radiation therapy and have revealed a high incidence of complications and poor cosmetic outcomes [14]. PMRT can adversely affect the cosmetic outcome of an immediate breast reconstruction [1]. Postmastectomy radiation therapy does not contraindicated SSM and immediate breast reconstruction appear safe with of higher rate of complications [15]. The available data regarding the role of PMRT after NSM is limited and without level I evidence, however the available studies series documenting low rates of local recurrence with radiotherapy [13]. Postoperative radiation therapy does not affect rate of nipple preservation after surgery as it was 90% among 47 patients received postoperative radiotherapy in the series of 216 patients. The overall rate of nipple preservation, excluding cases of NAC involvement, after surgery and Postoperative radiation therapy was comparable to surgery alone [16]. Postoperative radiation therapy can be delivered after skin sparing mastectomy with the same indication after modified radical mastectomy, If immediate breast reconstruction is decided, implant can be done more safely keeping autologous breast reconstruction later, however autologous immediate breast reconstruction can be done with high skilled team [3]. Acute toxicities reported in our study has no significant difference compared to other study done in our department after BCS [10,17]. Mehta et al. reported more acute skin toxicities and schedule interruption, because they used skin bolus and electron boost in their technique [18]. Although results from individual series vary, complications following immediate breast reconstruction and PMRT occur in a high proportion of patients [14] and the overall complication rate of PMRT following autologous breast reconstruction ranges from 5% to 16% [19]. Although PMRT is associated with a higher incidence of complications, a satisfactory cosmetic outcome can be achieved in most patients [15]. Majority of our (83.3%) patients has satisfactory overall cosmetic similar to other studies that reported excellent or good results in 84% of patients and only 5% reported a poor cosmetic result [20]. Fat necrosis leads to volume loss and hardening of the reconstructed breast and it can occurs, when immediate breast reconstruction followed by PMRT and it reported in 10.5% [20]. We reported fate necrosis in 4.2% causing unsatisfaction of this patient. Tran et al. have recommended that patients who need PMRT should undergo delayed free TRAM flap reconstruction to avoid late complications such as fat necrosis, volume loss and flap contracture. They reported higher rate of complication after autologous TRAM reconstruction and postoperative radiotherapy, as 24% required resurgery to manage flap contracture., and fat necrosis was reported in 34% of the flaps and loss of symmetry in 78% [9] this rate of higher complication compared to our study due to retrospective nature of the study, higher doses (average dose was 59.99 Gy) and using old technique [patient received their treatment between 1988-1998) as we used 3CRT and asymmetric field in field technique in all patients.

Conclusion

From our study, we can have concluded that postoperative radiotherapy is safe with acceptable rate of complications and very good patient's satisfactions after skin sparing mastectomy and immediate autologous breast reconstruction.

References

1. Rozen WM, Ashton MW (2012) Radiotherapy and breast reconstruction: Oncology, cosmesis and complications. Gland Surg 1: 119-127.
2. Rusby JE, Smith BE, Gui GPH (2010) Nipple-sparing mastectomy. Br J Surg 97: 305-316.
3. NCCN Clinical Practice Guidelines in Oncology Breast NCCN Evidence Blocks; (2016) pp: 71.
4. Petit JY, Veronesi U, Lohsiriwat V, Rey P, Curigliano G, et al. (2011) Nipple-sparing mastectomy-is it worth the risk? Nat Rev Clin Oncol 8: 742-747.
5. Janssen S, Holz-Sapra E, Rades D, Moser A, Studer G (2015) Nipple sparing mastectomy in breast cancer patients: The role of adjuvant radiotherapy (Review) Oncol Lett 9: 2435-2441.
6. Tokin C, Weiss A, Wang-Rodriguez J, Blair SL (2012) Oncologic safety of skin-sparing and nipple-sparing mastectomy: A discussion and review of the literature. Int J Surg Oncol pp: 921821.
7. Lee HH, Hou MF, Wei SY, Lin SD, Luo KH (2016) Comparison of long-term outcomes of post-mastectomy Radiotherapy between breast cancer patients with and without immediate flap reconstruction. PLoS One 11: e0148318.
8. Benediktsson KP, Perbeck L (2008) Survival in breast cancer after nipple sparing subcutaneous mastectomy and immediate reconstruction with implants: A prospective trial with 13 years median follow-up in 216 patients. Eur J Surg Oncol 34: 143-148.
9. Tran NV, Evans GR, Kroll SS, Baldwin BJ, Miller MJ (2000) Postoperative adjuvant irradiation: Effects on transverse rectus abdominis muscle flap breast reconstruction. Plast Reconstr Surg 106: 313-317.
10. Abbas H, Mohammad H, Aly MMOM (2011) Asymmetric open field-infield can replace wedged fields in tangential whole breast irradiation 10: 250-255.
11. Cox JD, Stetz J, Pajak TF (1995) Toxicity criteria of the radiation therapy oncology group (RTOG) and the European organization for research and treatment of cancer (EORTC). Int J Radiat Oncol Biol 31(5): 1341-1346.
12. Radiation Therapy Oncology Group (1999) RTOG/EORTC late radiation morbidity scoring schema.
13. Gomez C, Shah C, McCloskey S, Foster N, Vicini F (2014) The role of radiation therapy after nipple-sparing mastectomy. Ann Surg Oncol 2237-2244.
14. Kronowitz SJ, Robb GL (2004) Breast reconstruction with postmastectomy radiation therapy: Current issues. Plast Reconstr Surg 114: 950-960.
15. Mokbel R, Mokbel K (2006) Skin-sparing mastectomy and radiotherapy: An update. Int Semin Surg Oncol 3: 35.
16. Benediktsson KP, Perbeck L (2008) Survival in breast cancer after nipple sparing subcutaneous mastectomy and immediate reconstruction with implants: A prospective trial with 13 years median follow-up in 216 patients. Eur J Surg Oncol 34: 143-148.
17. Abbas H, Salem M, Salem A, Binziad S, Abuo M (2011) Breast cancer: Radiotherapy at the South Egypt cancer institute. Gastric Breast Cancer 10: 180-186.
18. Mehta VK, Goffinet D (2004) Post-mastectomy radiation therapy after TRAM flap breast reconstruction. Breast J 10: 118-22.
19. Singletary SE, Robb GL (2003) Oncologic safety of skin-sparing mastectomy. Ann Surg Oncol 10: 95-97.
20. Hunt KK, Baldwin BJ, Strom EA, Ames FC, McNeese MD, et al. (1997) Feasibility of post-mastectomy radiation therapy after TRAM flap breast reconstruction. Ann Surg Oncol 4: 377-384.