Immediate Flap Reconstruction Role in Long term Outcome of Post Mastectomy Radiotherapy

Mohamed M.E Ibrahem[2],*, Shaban M. Abdel Mageed[1],*, and Shawki M.K Sharouda[1]
*El Demerdash Hospital, General Surgery Department, Faculty of Medicine, Ain Shams University; [1]Assistant Professor General Surgery, Faculty of Medicine, Ain Shams University; [2]Lecturer of General Surgery, Faculty of Medicine, Ain Shams University

ABSTRACT

Introduction: *Surgical management of breast cancer includes breast conservative surgery & mastectomy. Studies showed that patients receiving post mastectomy radiotherapy (PMRT) after modified radical mastectomy (MRM) has lower 10 years rate of local recurrence & better survival rate than those who didn't receive PMRT according to the Danish breast cancer cooperative group 82b, 82c (1, 2) & another Canadian research also supported that PMRT reduces rate of local & systemic relapse & reduces mortality from breast cancer (3). Patients undergoing MRM face a strong psychological trauma as they are set to lose an important sexual characteristic & also facing the deformity of their body figure causing more conflict in their life, so emerged the idea of immediate breast reconstruction after MRM, as these patients received both surgeries together rather than the traditional method of delayed reconstruction which offer not only cosmetic but also psychological advantages. Immediate flap reconstruction whether it will interfere with long term survival or not must be taken into consideration. However there was no study concerned with effect of immediate TRAM on long term survival rate with PMRT, so keeping the patient best interest in mind, emerged the idea of the study is to identify the influence of immediate breast reconstruction on survival rate in patients receiving PMRT.* ***Aim of the work:*** *To identify the effect of immediate transverse rectus abdominismyocutaneous flap reconstruction on long term outcome of post mastectomy radiotherapy.* ***Methods and methods:*** *In this prospective study 74 patients were managed at Ain shams university hospital from February 2014 to February 2017 from whom the following data were collected: age at diagnosis, adjuvant CT & hormonal treatment, information regarding primary surgery, local recurrence & distant metastasis, hormonal receptor status, histological diagnosis & staging, all stages were determined according to American joint committee on cancer (AJCC) staging system 6th edition. Pre treatment work up including history, physical examination, CBC, liver function tests, chest radiography, abdominal ultrasound, serum carcinoembryonic antigen, CA-153 test & technetium99 bone scintigraphy in addition to counseling as regards breast reconstruction.* ***Results:*** *Among 74 patients ,36 had immediate TRAM flap reconstruction &38 didn't had immediate TRAM flap reconstruction ,follow up for 3 years , 3year overall survival rate were 61% for TRAM flap group58% for the non - flap group.3year disease free were 58% for the TRAM flap group 61% for the non- flap group.* ***Conclusion:*** *According to our statistical data there is no significant difference between immediate TRAM flap reconstruction &no reconstruction in terms of local recurrence, distant metastasis, disease free & overall survival rate in patient receiving PMRT.***

INTRODUCTION

Surgical management of breast cancer includes breast conservative surgery & mastectomy. Studies showed that patients receiving post mastectomy radiotherapy(PMRT) after modified radical mastectomy (MRM) has lower 10 years rate of local recurrence & better survival rate than those who didn't receive PMRT according to the Danish breast cancer cooperative group 82b, 82c [(1,2)] & another Canadian research also supported that PMRT reduces rate of local & systemic relapse & reduces mortality from breast cancer [(3)].

Patients undergoing MRM face a strong psychological trauma as they are set to lose an important sexual characteristic & also facing the deformity of their body figure causing more conflict in their life, so emerged the idea of immediate breast reconstruction after MRM, as these patients received both surgeries together

rather than the traditional method of delayed reconstruction which offer not only cosmetic but also psychological advantages. Immediate flap reconstruction whether it will interfere with long term survival or not must be taken into consideration. However there was no study concerned with effect of immediate TRAM on long term survival rate with PMRT, so keeping the patient best interest in mind, emerged the idea of the study is to identify the influence of immediate breast reconstruction on survival rate in patients receiving PMRT

AIM OF THE WORK

The aim of this study is to compare the long-term clinical outcomes of post mastectomy radiotherapy (PMRT)between breast cancer patients with and without immediate transverse rectus abdominismyocutaneous (TRAM) flap reconstruction

MATERIALS AND METHODS

In this prospective study 74 patients were managed atAin shams university hospital from February 2014 to February 2017 from whom the following data were collected: age at diagnosis, adjuvant CT & hormonal treatment, information regarding primary surgery, local recurrence & distant metastasis, hormonal receptor status, histological diagnosis & staging, all stages were determined according to American joint committee on cancer (AJCC) staging system 6th edition.

Pre treatment work up including history, physical examination, CBC, liver function tests, chest radiography, abdominal ultrasound, serum carcinoembryonic antigen, CA-153 test & technetium99 bone scintigraphy in addition to counseling in regards to breast reconstruction.

A written consent was provided by our patients after being informed about the study, its steps & the treatment protocol.

All 74 patients underwent MRM with pathological stage II or III & were informed about option of immediate breast reconstruction. 36 patients (49%) choose immediate breast reconstruction after MRM & were put in TRAM group .figure A,B,C,D, the remaining 38 (51%) were put in non – flap group.

All patient received chemotherapy based on chemotherapy (CT) regimens, hormonal receptor positive patients received adjuvant hormonal therapy.

All patients received mean dose of 50 (range 48–54) Gy in a daily fraction of 1.8–2 Gy 5 days a week. The target included mastectomy scar, ipsilateral chest wall, the supraclavicular or infraclavicular, with or without axillary lymph nodes, drain sites if possible, axillary nodal basins was included if axillary nodal dissection wasn't complete.

In the first year patients were checked every3 months, the subsequently every 6 months thereafter, the duration of follow up was from the time of MRM to the date of local failure or the last follow up, recurrence within the supraclavicular or infraclavicular regions, axilla & chest wall was defined as local failure, recurrence outside theses areas was classified as distant metastasis.

We used surgical resection, biopsy or cytology and / or radiological findings which increased in size over time to confirm local recurrence, as for distant metastasis chest x-ray, abdominal ultra sound, CT of the chest & bone scan were used, our end points were disease free survival (DFS) & overall survival (OS).

Fig. A: TRAM flap elevation done

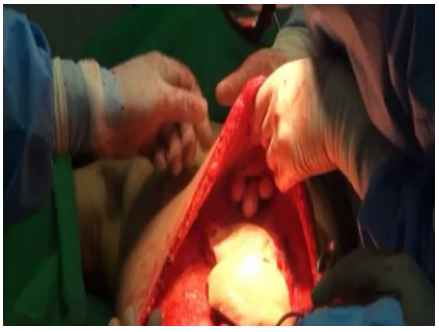

Fig. B: Flap migration to breast pocket

Fig. C: Abdomin closure with synthetic mesh

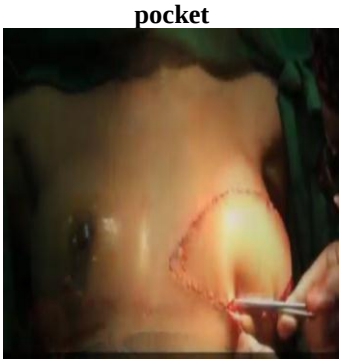

Fig. D: Breast closure

RESULTS

According to theclinicopathologic characteristics of 74 patients. There was no significant difference in terms of follow-up time, laterality, tumor location, pathological cell pattern, pathological tumor and nodal classification stage, ER and PR status between the two groups table 1

As shown in Table 2, local recurrence was seen in 4patients (11%) of the TRAM flap group and 4 patients (10.5%) in the non-flap group ($p = 0.136$).

DFS were significantly worse with any positive nodal number compared with N0 ($p<0.001$), and negative ER status($p = 0.001$). With or without TRAM flap reconstruction did not affect DFS Table 3

TRAM flap reconstruction did not affect OS (HR = 0.791; 95% CI, 0.510 to 1.227).

The 3-year DFS were 58% for the TRAM flap group and 61% for the non-flap group. The 3-year OS were 61 for the TRAM flapgroup and 58% for the non-flap group. Table 3.

Table 1: Shows clinicopathologic characteristics of the patients divided into two groups

	TRAM group	Non- flap group	p value
Laterality	0. 714		
Left	20(55.5%)	21(55%)	
Right	16(44.5%)	17(45%)	
Mean age, years (range)	45.36 (26-61)	47.24 (27- 59)	<0.001
<50	26(72%)	27(71%)	
≧50	10(28%)	11(29%)	
Pathology	0,184		
Infiltrating ductal carcinoma	32(89%)	31(82%)	
Infiltrating lobar carcinoma	2(5%)	3(8%)	
Medullary carcinoma	1(2.7%)	2(5%)	
Others	1(2.7%)	2(5%)	
Location	0. 798		
Lateral	30(83%)	31(82%)	
Central / medial	6(17%)	7(18%)	
Pathological T classification	0.219		
1	31(86%)	30(79%)	
2	5(14%)	8(21%)	
Pathological N classification	0.416		
0	9(25%)	9(24%)	
1	18(50%)	19(50%)	
2	7(19%)	8(21%)	
3	2(6%)	2(5%)	
Pathologic stage	0.356		
II	20(55.5%)	21 (55%)	
III	16(44.5%)	17(45%)	
Progesterone receptor status	0.821		
Positive	18(50%)	20(53%)	
Negative	15(42%)	17(45%)	
Uncertain	3(8%)	1(2%)	
Estrogen receptor status	0.916		
Positive	17(47%)	19(50%)	
Negative	16(44%)	10(26%)	
Uncertain	3(9%)	9(24%)	

Table 2 shows outcome of local recurrence and distant metastasis

	TRAM group	Non-flap group	p value
Total number of patients	36(49%)	38(41%)	
Local recurrence	4(11%)	4(10.5%)	0.659
Distant metastasis	7(19.4%)	8(21%)	0.716

Table 3: Shows disease free survival and overall survival

	TRAM group	Non-flap group	p value
Overall survival (month)	0.316		
<18	14(39%)	16(42%)	
≧36	22(61%)	22(58%)	
Disease free survival (month)	0.921		
<18	15(42%)	15(39%)	
≧36	21(58%)	23(61%)	

DISCUSSION

After MRM patients were left with the psychological impact & body disfigurement of losing one breast, so we may perform post mastectomy reconstruction either immediately or after a delay& can use patient's own tissue, breast implants or both[6]. Autogenous tissue reconstruction had a better out come as it appears more natural [8] & required fewer follow up visits & fewer subsequent surgical procedures than tissue expanders [5]. Patients with a body mass index less than 22 kg/m2 are more satisfied with their breast than patients who had prosthetic reconstruction with tissue expanders or implants according to Weichman and colleagues[7]. Wong and colleges had a review of 62 patients, in which 38 non – implant patients didn't undergo major corrective surgery within 6 months compared to 3 of the 13 implant patients[8], in berry and colleagues evaluation of 1037 patients, they concluded that there is no significant difference between irradiated and non- irradiated autologous tissue reconstruction[9], according to Barry and kellmeta analysis autologous reconstruction was associated with less morbidity than implant-based reconstruction when PMRT was delivered after breast reconstruction[10]. In HO and colleagues study of 151 patients treated with immediate stage II tissue expanders & Implants reconstruction 7 years DFS was 81% and 7 years OS rate was 93%[4], recent reviews nowadays suggest that breast reconstruction doesn't negatively affect detection of recurrence.

CONCLUSION

According to our statistical data there is no significant difference between immediate TRAM flap reconstruction &no reconstruction in terms of local recurrence, distant metastasis, disease free & overall survival rate in patient receiving PMRT**.** so Immediate TARM flap reconstruction prior to PMRT does not compromise breast cancer patients' survival.

Disclosure:

This article is not sponsored by any company, so the authors have no competing interests as defined by Nature Publishing Group, or other interests that might be perceived to influence the results and/or discussion reported in this article.

REFERENCES

1. Overgaard M, Hansen PS, Overgaard J, Rose C, Andersson M, Bach F, et al.Postoperative radiotherapy in high-risk premenopausal women with breast cancer who receive adjuvant chemotherapy. Danish Breast Cancer Cooperative Group 82b Trial. The New England journal of medicine. 1997; 337 (14):949–55.
2. Katz A, Strom EA, Buchholz TA, Thames HD, Smith CD, Jhingran A, et al. Locoregional recurrence patterns after mastectomy and doxorubicin-based chemotherapy: implications for postoperative irradiation. J ClinOncol. 2000; 18(15):2817–27.
3. Ragaz J, Jackson SM, Le N, Plenderleith IH, Spinelli JJ, Basco VE, et al.Adjuvant radiotherapy and chemotherapy in node-positive premenopausal women with breast cancer. The New England journal of medicine. 1997; 337(14):956–62.
4. Ho A, Cordeiro P, Disa J, Mehrara B, Wright J, Van Zee KJ, et al.Long-term outcomes in breast cancer patients undergoing immediate 2-stage expander/implant reconstruction and postmastectomy radiation. Cancer. 2012; 118(9):2552–9.
5. Kronowitz SJ, Kuerer HM. Advances and surgical decision-making for breast reconstruction. Cancer. 2006; 107(5):893–907.
6. McCormick B, Wright J, Cordiero P.Breast reconstruction combined with radiation therapy: long-term risks and factors related to decision making. Cancer journal (Sudbury, Mass). 2008; 14(4):264–8.
7. Weichman KE, Broer PN, Thanik VD, Wilson SC, Tanna N, Levine JP, et al.Patient-Reported Satisfaction and Quality of Life following Breast Reconstruction in Thin Patients: A Comparison between Microsurgical and Prosthetic Implant Recipients. Plastic and reconstructive surgery. 2015; 136(2):213–20.
8. Wong JS, Ho AY, Kaelin CM, Bishop KL, Silver B, Gelman R, et al.Incidence of major corrective surgery after post-mastectomy breast reconstruction and radiation therapy. The breast journal. 2008; 14 (1):49–54.

9. Berry T, Brooks S, Sydow N, Djohan R, Nutter B, Lyons J, et al.Complication rates of radiation on tissue expander and autologous tissue breast reconstruction. Annals of surgical oncology. 2010; 17 Suppl 3:202–10.

10. Barry M, Kell MR.Radiotherapy and breast reconstruction: a meta-analysis. Breast cancer researchand treatment. 2011; 127(1):15–22.