



Immediate Versus Delayed Breast Reconstruction: A Literature Review and Analysis of Psychosocial Outcomes

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Abstract

Background: Breast cancer is the most prevalent cancer in women and has a lifetime incidence of one in nine. Mastectomy may be accompanied by neo-adjuvant and adjuvant therapy. Breast reconstruction is an integral part of treatment of breast cancer, and could be performed either at the time of mastectomy, immediate breast reconstruction (IBR), or at a later stage, delayed breast reconstruction (DBR).

Outcomes such as psychosocial morbidity, aesthetics and complications rates may differ between the two approaches. Although there is no universal consensus on superiority of either approach, there is an evidence to support the fact that the aesthetic result, psychosocial effect, and cost of breast reconstruction are better with immediate reconstruction, but the risk of surgical complications is less with delayed reconstruction.

Objectives: To review and analyze the current literature comparing the psycho-social outcomes comparing both approaches; IBR and DBR.

Search Methods: Online search was performed in August 2015 using Pubmed, Embase and Medline databases, to identify articles related to breast reconstruction. All articles assessing psycho-social and other related outcomes were collected and reviewed. Only articles reported in English were included.

Data Collection and Analysis: The first author screened papers, extracted trial details and performed the literature review and analysis. Post-operative morbidity and mortality were not addressed.

Main Results: Psychological distress is evident among women regardless of reconstruction or timing of reconstruction. Psycho-social outcomes are variable, and include quality of life, sexual functioning, cancer-related distress, body image, depression, and anxiety. There is a greater body of evidence, though unreliable, to support the relatively higher psychosocial outcomes in IBR group compared to the DBR, and in the reconstruction group compared to the non-reconstruction group. However, recently developing evidence is also suggesting relative superiority of the DBR in certain aspect of these variable psycho- social outcomes.

In the literature search, only one Randomized Clinical Trial (RCT) compared the IBR to the DBR. The data suggest that women presenting for mastectomy and breast reconstruction at different stages of reconstruction have different baseline psycho-social baseline. Such data, and encouragement for further larger prospective ones, will improve our understanding in patient selection and expectation, and decision making on appropriate timing of reconstruction. However, this must be put into the context of the clinical needs of the patient and logistic demand of the system managing these patients.

Introduction

The aim of the surgical treatment of breast cancer should not be just to cure or reduce the tumour, but to gain the best aesthetic results with the best psychological and physical impact. Mastectomy is associated with significant psychosocial sequelae including distorted body image, emotional disturbances, sexual dysfunction and others [1]. Breast reconstruction, described as a “reverse mastectomy” is assumed to help restoring emotional and physical recovery from a breast cancer treatment crisis, though itself has its own lineal and psychosocial sequelae [2].

The psychosocial, emotional and functional adaptations of breast reconstruction post mastectomy have been extensively studied over the last few years [3-4]. Previous studies have demonstrated the positive effects on psychological health, self-esteem, sexuality, body image and

OPEN ACCESS

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Received Date: 29 Sep 2017

Accepted Date: 15 Nov 2017

Published Date: 22 Nov 2017

Citation:

Othman D. Immediate Versus Delayed Breast Reconstruction: A Literature Review and Analysis of Psychosocial Outcomes. *Ann Plast Reconstr Surg.* 2018; 2(1): 1009.

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reduced concerns of cancer recurrence [5-6], and were reported by the literature to be one of the most relevant factors of long-term health and well-being [7].

Reconstruction can be accomplished with autologous tissues flaps, prosthetic breast implants, or a combination of both, and can be carried out at the time of the mastectomy, referred to immediate breast reconstruction (IBR), or after some months or even years have elapsed, referred to delayed breast reconstruction (DBR) [8].

Psycho-social outcomes in reconstructed versus non-reconstructed breast patients

Reconstruction group (IBR and DBR) versus non-reconstruction group: Earlier studies have suggested a variety of positive psycho-social outcomes of breast reconstruction, most importantly improved body image [9-10], social well-being [11] and sexuality [12], few of which assessed the effect of the procedure choice on these psychosocial outcomes. As Jabor, et al. [13] pointed out in their study, the satisfaction experienced by women after breast reconstruction is not only based the surgical result alone, but also on a range of psychosocial factors and individual experiences, and concluded that satisfaction has both objective and subjective facets.

It was suggested that post oncological mastectomy breast reconstruction psycho-social outcomes continue to develop with time [14], reporting that psychosocial positive outcomes of breast reconstruction continue long term, compared to mastectomy alone. In their analysis [14] of psychosocial morbidity in women who underwent breast conservation therapy, mastectomy alone, or mastectomy with reconstruction, statistically significant differences were found between the 3 procedures. At an average of 51.2 months, psychosocial outcomes were highest in those with breast conservation followed by mastectomy with reconstruction, and least in mastectomy only group. In their study Fernandez, et al. [8] compared three groups: IBR, DBR and no breast reconstruction. They found out that the reconstruction group experienced less anxiety and depression compared to those who had undergone mastectomy alone.

On the other hand, there was a paucity of literature to suggest no difference in these outcomes between the reconstruction and the non-reconstruction group. Fung, et al. [15] and Nano, et al. [6] did not find any statistically significant psychosocial outcomes in patients who had breast conservation, mastectomy alone, or mastectomy with reconstruction.

A recent study by Metcalfe, et al. [16] reported on the changes in psychosocial functioning over 1 year following breast cancer surgery in 3 groups of women, including those with mastectomy alone, those with mastectomy and immediate reconstruction, and those with delayed reconstruction. Contrary to the assumed psychological benefits of breast reconstruction, psychological distress was evident among women regardless of reconstruction or timing of reconstruction. Further, they reported that psychosocial functioning (including quality of life, sexual functioning, cancer-related distress, body image, depression, and anxiety) was not different at 1-year post-surgery between women with mastectomy alone, mastectomy with immediate reconstruction, and delayed reconstruction.

IBR versus non-reconstruction group: Earlier studies, including Jabor et al. [13], Guy et al. [17], Moscona, et al. [18] and Druker, et al. have reported higher levels of patients' satisfaction (64% -90%) for IBR group compared to non- reconstruction group. The percentage reported by Moscona, et al. [18] was 86% when satisfaction was

measured when the patient was dressed, but this fell to 48% when undressed.

DBR versus non-reconstruction group: Harcourt et al. [19] found statistically significant positive psychosocial outcomes in women with DBR group compared with non-reconstruction group, though these results were at 3 months post-operatively which disappeared at 12 months.

Psycho-social outcomes in reconstructed breast patients: IBR versus DBR groups

As explained later in this literature review and analysis, there was a confounding data comparing psycho- social outcomes between IBR and DBR groups, with a significantly larger body of evidence supporting improved psychosocial outcomes in the IBR in general psychosocial outcomes measures, however, with minority subclasses of these measures favoring DBR. In their study, Fernandez, et al. [8], compared non-reconstruction breast patients with reconstructed ones, with further comparison between IBR and

DBR, and concluded that their study patients have reported a post-procedure preference for IBR in their questionnaire answers. The aesthetic results achieved by IBR seem to be those best accepted. However, Rubino, et al. [20] found no significant differences between IBR and DBR in terms of anxiety and depression.

The only reported Randomized Clinical Trial (RCT) in Literature was reported by Dean, et al. [21]. In their study, Dean et al. randomly allocated 64 women with operable breast cancer at the time of mastectomy to two groups; a group receiving IBR and a control group who was offered DBR at 12 months later. The objective of the trial was to determine whether IBR affected the psychosocial morbidity of mastectomy. The IBR group showed reduction in psychiatric morbidity assessed 3 months after operation, predominantly in women with unsatisfactory marriages. Women who underwent reconstruction had more freedom of dress and were less likely to be repulsed by their own naked appearance than women who did not undergo reconstruction. Sexual and social morbidity were not affected between the two groups.

Edwin and colleagues [22] reported a 1-year postoperative psychosocial outcomes study, the Michigan Breast Reconstruction Outcome Study (MBROS-1), which was the first prospective study evaluating and comparing the outcomes of immediate versus delayed breast reconstruction following oncological mastectomy, using three commonly procedures (implant / tissue expander, pedicled TRAM flap (transverses rectus abdominis myocutaneous flap), and free TRAM flap). This study represents the first prospective study exploring this topic. The analysis included patients from 12 different centers and 23 surgeons, minimizing the risk of confounding effects of treatment site and provider. Outcomes assessed included emotional well-being, vitality, general mental health, social functioning, functional well-being, social well-being, and body image. The IBR group showed significant improvements in all psychosocial variables except body image. However, the procedure type itself did not affect these outcomes. The DBR group had significant increase in emotional well-being, vitality, general mental health, functional well- being, and body image. Although the choice of the reconstructive procedure did not significantly affect most of the outcomes, there were significant differences between procedure types for three psychosocial subscales in the DBR group. The delayed implant-expander reconstruction showed higher vitality and social well-being compared to the flaps.

On the other hand, the delayed TRAM flaps had significantly better gains in body image compared to delayed implant-expander. The authors concluded that the reconstructive options for both groups had significant psychosocial positive outcomes for mastectomy patients. Although the procedure option itself does not significantly affect the psychosocial status in immediate reconstruction, it does play a significant role on gains in vitality, body image and social well-being in women with delayed reconstruction. The main limitation of this study was that, as with all outcome studies, longer follow up and assessment are crucial as late complications seem to evolve over time [23,24,25], and subsequently negatively impact the outcome results compared to the flap option.

In the second study from the same Centre in Michigan, MBROS-2, Atisha and colleagues prospectively evaluated the patients' psychosocial outcomes at 1 year and 2 years' post mastectomy in both IBR and DBR groups. The psychometric instruments used in MBROS-2 included 2 previously published, validated health-related quality of life surveys [26] the Medical Outcome Study Short Form-36 (SF-36), subdivided into 4 subclasses: (RE: role emotional, V: vitality, SF: social functioning and MH: mental health), and the Functional Assessment of Cancer Therapy-Breast (FACT-B), subdivided into 2 subclasses: (FW: functional well-being and SW: social wellbeing). Both scales were the same used by the first study by Edwin and colleagues [22] with a newly designed condition-specific item set of 9 questions to evaluate patients' appreciation of their physical appearances, making it a total of seven psychosocial subclasses. Their analysis results showed that the IBR group had statistically significant gains in the four subclasses of SF-36 and in FW subclass of the FACT-B. There was an increase in the body image subclass but was not statistically significant. The FACT-B SW subclass showed statistically significant lower scoring. Using the regression analysis to control for preoperative scores and patients' ages, changes in all seven psychosocial subclasses did not vary significantly by procedure type except for FACT-B social wellbeing subclass. The implant-expander and pedicled TRAM flap showed declines in social well-being at 2 years, however, the mean score for this outcome for the free TRAM flap cohort increased post operatively to a statistically significant level.

These results correlate with previous studies by Edsander-Nord, et al. [27] and Brandberg, et al. [28]. Both studies did not find significant statistical differences between procedure types on psychosocial outcomes. Interestingly, in Atisha, et al. [25] study, the IBR group reported small variation in their body image scores between their pre-operative and 2-year post-operative assessment. Maybe that is because these women were "protected" from the body image disturbances caused by the mastectomy.

Rosson, et al. [29] interesting study on preoperative comparison of patients with immediate, delayed, and major revision reconstruction suggested that women undergo breast reconstruction at different time- points in their cancer care; knowing patients' preoperative quality of life (QoL) is critical in the overall care of the patient with breast cancer. The three groups differed significantly across four of the six domains: body image, psychosocial well-being, sexual well-being, and physical well-being of the chest and upper body. The IBR group had higher (better) scores than the DBR group, which had higher (better) scores than the major revision group. These data suggest that women presenting for breast reconstruction at different stages of reconstruction have different baseline QoL. Such data may help us better understand patient selection, education, and expectations, and

may lead to improved patient-surgeon communication.

Discussion and Conclusion

The above studies showing confounding results, however, mainly supporting IBR over DBR, were retrospective in nature with relatively small samples. Also, they all looked individually on certain aspect of post-operative psychosocial outcome, such as anxiety, depression and many others as explained earlier. These confounding results suggest that additional multicenter, prospective research studies are essential to measure the effect of breast reconstruction on long-term life quality outcomes. Pusic, et al. [30] claims that to appropriately evaluate psychosocial outcomes, well-developed validated patient questionnaires are needed to assess issues that are specific to patients undergoing breast reconstruction, referred to "condition-specific" measures.

It has proven to be difficult to estimate the point at which these outcomes stop evolving and decide the correct timing of evaluating these psychosocial outcomes. Harcourt and Rumsey [19] examined patients' satisfaction with breast reconstruction and suggested that a longitudinal approach is more valuable in future assessments of breast reconstruction patients' satisfaction as post-operative adjustment in a dynamic process. The same study expressed that many women reported unrealistic expectations regarding the reconstruction outcomes including recovery time, complications and aesthetic results. This plays an important role in implication in practice; as many women in that study retrospectively expressed a desire for more information in their consultation. This will give these patients a better insight into these outcomes and probably increase their satisfaction post-operatively. Though, minority of women were pleased that they have not been provided with a large volume of information as they might not have opted for the surgery. This further suggests that patient's satisfaction post breast reconstruction is patient specific.

Given the results shown above suggesting the more favorable psychosocial outcome of IBR over DBR, as well as the reflections medical professionals regarding the negative aspects of living with the deformity caused by mastectomy, breast reconstruction (especially IBR) should be carried out whenever feasible. However, it should be emphasized that not all the patients are candidates for IBR, due to certain post-operative clinical needs, such as the need for tumor clearance, post-operative adjuvant therapy and other patient specific factors, that must be adjusted prior to reconstruction to increase the surgical reconstruction success rate, without delaying the oncological mastectomy and increasing the risk of local, regional and systemic spread. Chevray [31] claimed that, although IBR is oncologically safe and esthetically advantageous, less than 20% of patients having a mastectomy have immediate breast reconstruction. They claimed that radiation treatment before or after mastectomy has a negative impact on the outcome of breast reconstruction and is one important factor to be considered in determining the optimal timing for breast reconstruction.

The current decision on the specific procedure carried out and its timing is dependent on anecdotal data, or at best, prospective data gathered over a maximum of 2 years post operatively. Outcomes of reconstruction may be affected by numerous confounding variables which a cohort study cannot control no matter how well designed. Finally, as previously critiqued in Wilkins, et al. [32], although an RCT may be more effective in controlling confounding factors, there are practical and ethical barriers to conducting an RCT for breast

reconstruction procedures and obviously, the patient retains the right to choose their reconstructive option. In addition, inclusion of non-reconstructive mastectomy as well as non-mastectomy cohorts would be more useful in evaluating and measuring these outcomes. Development of such longer-term data will facilitate decision making for both the patient and the surgeon, and may show the value of these procedures on health care payers and policy makers.

Conflict of Interest

The author(s) declare that they have no conflict of interest.

References

1. Wilkins EG, Cederna PS, Lowery JC, Davis JA, Kim HM, Roth RS, et al. Prospective analysis of psychosocial outcomes in breast reconstruction: one-year postoperative results from the Michigan Breast Reconstruction Outcome Study. *Plast Reconstr Surg*. 2000;106(5):1014-25.
2. Asken MJ. Psychoemotional aspects of mastectomy: a review of recent literature. *Am J Psychiatry*. 1975;132(1):56-9.
3. Hopwood P and Maguire GP. Body image problems in cancer patients. *Br J Psychiatry Suppl*. 1988;153:47.
4. Anderson SG. Treatment considerations in postmastectomy reconstruction: Their relative importance to patient satisfaction. *Ann Plast Surg*. 1994;33:263-70.
5. Al-Ghazal SK, Sully L, Fallowfield L, Blamey RW. The psychological impact of immediate rather than delayed breast reconstruction. *Eur J Surg Oncol*. 2000;26(1):17-9.
6. Nano MT, Gill PG, Kollias J, Bochner MA, Malycha P, Winefield HR. Psychological impact and cosmetic outcome of surgical breast cancer strategies. *ANZ J Surg*. 2005;75(11):940-7.
7. Harcourt DM, Rumsey NJ, Ambler NR, Cawthorn SJ, Reid CD, Maddox PR, et al. The psychological effect of mastectomy with or without breast reconstruction: a prospective, multicenter study. *Plast Reconstr Surg*. 2003;111:1060-1068.
8. Fernandez-Delgado. Satisfaction with and psychological impact of immediate and deferred breast reconstruction. *Ann Onc*. 2008;19:1430-4.
9. Corsten LA, Suduikis SV, Donegan WL. Patient satisfaction with breast reconstruction. *Wis Med J*. 1992;91(3):125-6, 129.
10. Mock V. Body image in women treated for breast cancer. *Nurs Res*. 1993;42(3):153-7.
11. Jonsson CO. Psychological aspects of breast reconstruction following mastectomy. *Scand J Plast Reconstr Surg*. 1984;18:317.
12. Schain WS. The sooner the better: A study of psychological factors in women undergoing immediate versus delayed breast reconstruction. *Am J Psychiatry*. 1985;142:40.
13. Jabor MA. Nipple-areola reconstruction: satisfaction and clinical determinants. *Plast Reconstr Surg*. 1984;110(2): 457-463.
14. Al-Ghazal S. Comparison of psychological aspects and patient satisfaction following breast conserving surgery, simple mastectomy, and breast conservation. *Eur J Cancer*. 2000;36:1938-43.
15. Fung KW. The impact of mastectomy, breast-conserving treatment and immediate breast reconstruction on the quality of life in Chinese women. *ANZ J Surg*. 2001;71:202-6.
16. Metcalfe KA, Semple J, Quan ML, Vadaparampil ST, Holloway C, Brown M, et al. Changes in psychosocial functioning 1 year after mastectomy alone, delayed breast reconstruction, or immediate breast reconstruction. *Ann Surg Oncol*. 2012;19(1):233-41.
17. Gui GP. Immediate breast reconstruction using bidimensional anatomical permanent expander implants: a prospective analysis of outcome and patient satisfaction. *Plast Reconstr Surg*. 2003;111(1):139-140.
18. Moscona RA, Holander L, Fodor L. Patient satisfaction and aesthetic results after pedicled transverse rectus abdominis muscle flap for breast reconstruction. *Ann Surg Oncol*. 2006;13(12):1739-46.
19. Harcourt D, Rumsey N. Mastectomy patients' decision-making for or against immediate breast reconstruction. *Psychooncology*. 2004;13(2):106-15.
20. Rubino C. Post-mastectomy reconstruction: a comparative analysis on psychosocial and psychopathological outcomes. *J Plast Reconstr Aesthet Surg*. 2007;60(5):509-518.
21. Dean C, Chetty U, Forrest AP. Effects of immediate breast reconstruction on psychosocial morbidity after mastectomy. *Lancet*. 1983;1(8322):459-62.
22. Edwin G. Prospective Analysis of Psychosocial Outcomes in Breast Reconstruction: One-Year Postoperative Results from the Michigan Breast Reconstruction Outcome Study. *Plast Reconstr Surg*. 2000;106(5):1014-25.
23. Alderman AK. Complications in post-mastectomy breast reconstruction: two year results of the Michigan breast reconstruction outcome study. *Plast Reconstr Surg*. 2002;109:2265-2274.
24. Gylbert L, Olle A, Göran J. Capsular contracture after breast reconstruction with silicone-gel and saline-filled implants: a 6-year follow-up. *Plast Reconstr Surg*. 1990;85:373-7.
25. Roth R. Quality of life and affective distress in women seeking immediate versus delayed breast reconstruction after mastectomy for breast cancer. *Plast Reconstr Surg*. 2005;116:993-1002.
26. Atisha D, Alderman AK, Lowery JC, Kuhn LE, Davis J, Wilkins EG. Prospective analysis of long-term psychosocial outcomes in breast reconstruction: two-year postoperative results from the Michigan Breast Reconstruction Outcomes Study. *Ann Surg*. 2008;247(6):1019-28.
27. Edsander-Nord A, Brandberg Y, Wickman M. Quality of life, patients' satisfaction, and aesthetic outcome after pedicled or free TRAM flap breast surgery. *Plast Reconstr Surg*. 2001;107(5):1142-53.
28. Brandberg Y. Prospective and randomized study "SVEA" comparing effects of three methods for delayed breast reconstruction on quality of life, patient-defined problem areas of life, and cosmetic result. *Plast Reconstr Surg*. 2000;105:66-74.
29. Rosson GD, Shridharani SM, Magarakis M, Manahan MA, Basdag B, Gilson MM, et al. Quality of life before reconstructive breast surgery: A preoperative comparison of patients with immediate, delayed, and major revision reconstruction. *Microsurgery*. 2013;33(4):253-8.
30. Pusic AL. Measuring quality of life in cosmetic and reconstructive breast surgery: a systematic review of patient-reported outcomes instruments. *Plast Reconstr Surg*. 2007;120:823-837.
31. Chevray PM. Timing of breast reconstruction: immediate versus delayed. *Cancer J*. 2008;14(4):223-9.
32. Roth RS, Lowery JC, Davis J, Wilkins EG. Persistent pain following postmastectomy breast reconstruction: long-term effects of type and timing of surgery. *Ann Plast Surg*. 2007;58(4):371-6.