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Self-Esteem and Patients' Satisfaction After Deep Inferior Epigastric Perforator Flap Breast Reconstruction

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The objective of this article is to assess the impact of deep inferior epigastric perforator (DIEP) flap breast reconstruction on self-esteem and to analyze the correlation between aesthetic outcome and self-esteem. Global self-esteem was evaluated using the Rosenberg Self-Esteem Scale in 31 patients who underwent DIEP flap breast reconstructions. A study-specific questionnaire and photographic evaluation were used by the patient, the plastic surgeon, and the oncological surgeon to measure satisfaction with the aesthetic outcome. Patients' satisfaction and self-esteem were analyzed for any existing correlation. Overall patients' satisfaction had a mean score of 6.55 (range, 0–10) on the Patient Satisfaction Questionnaire. A mean score of 32.48 (range, 10–40) was found on the Rosenberg Self-Esteem Scale. More than 80% of patients were content with their decision to undergo this procedure and would recommend this to a friend. Surgeons tended to rate the aesthetic outcome better than patients. Patients' satisfaction and self-esteem were found to be positively correlated. Patients are generally content with the outcome of primary DIEP flap breast reconstruction. The favorable aesthetic result of this procedure has a beneficial effect on patients' self-esteem.

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Psychosocial adjustment to breast cancer and mastectomy has long been a focus of attention and still remains a major focus of research. Earlier studies have described a wide range of lasting psychological disturbances (Anderson, Rodin, & Ariyan, 1994; Bard & Sutherland, 1995a; Bransfield, 1982; Clifford, 1979; Fobair et al., 2006; Goldberg, Stolzman, & Goldberg, 1984; Magistrato et al., 1982; Renneker & Cutler, 1952; Teimourian & Adham, 1982). Indeed, the loss of a body part that symbolizes womanliness, sexuality, and nurturance will inevitably disrupt body image and negatively impact a woman's self-esteem. Self-esteem reflects a person's overall appreciation of personal value. It encompasses beliefs about talents, capabilities, and shortcomings and accordingly influences one's ability to cope with cancer (Fitts et al., 2001; Pikler & Winterowd, 2003).

Breast reconstruction aims to diminish the impact of mastectomy on self-esteem and to improve patients' quality of life. Indeed, the psychosocial benefits of breast reconstruction have been documented manifold (Damen et al., 2010; Markopoulos et al., 2009; Nano et al., 2005; Noyan, Sertoz, Elbi, Kayar, & Yilmaz, 2006; Rubino, Figus, Lorettu, & Sechi, 2007; Sabino Neto, da Silva, Garcia, Freire, & Ferreira, 2007; Veiga et al., 2010).

Although quality of life as an outcome has received much attention, the concept of self-esteem after breast reconstruction has been explored to a much lesser extent. This study set out to evaluate the impact of deep inferior epigastric perforator (DIEP) flap breast reconstruction on self-esteem

using the Rosenberg Self-Esteem Scale (RSES). This valid, reliable, and simple tool allows measurement of self-esteem after breast reconstruction.

The RSES has been applied previously in the assessment of self-esteem after breast reconstruction (Markopoulos et al., 2009; Noyan et al., 2006; Rubino et al., 2007; Sabino Neto et al., 2007; Veiga et al., 2010). Whereas these studies evaluated differences in self-esteem pre- and postoperatively, we set out to compare self-esteem levels in women having undergone mastectomy and subsequent breast reconstruction to previously defined self-esteem levels in the general Dutch female population. Furthermore, we evaluated and compared both patients' and surgeons' satisfaction with the aesthetic result after reconstruction.

METHODS

Patients who underwent a primary DIEP flap breast reconstruction postmastectomy during the period of February 2005 to July 2007 were included in a cross-sectional survey. "Combined" bilateral reconstructions, that is, reconstructions comprising both a primary reconstruction on one side and a secondary or tertiary reconstruction on the contralateral side performed during the same operative procedure, were also included in our survey. All patients were operated at the Academic Hospital of Maastricht. Exclusion criteria comprised development of breast cancer in the contralateral breast or the presence of distant metastases at the time of survey. Patient characteristics and surgical data were obtained from medical records.

Patient-Based Outcome Measures

All patients were asked to complete two questionnaires, including the RSES (Dutch translation) and a study-specific questionnaire to measure satisfaction with the aesthetic result after reconstruction. Patients were asked to score their degree of satisfaction with reconstruction on a scale of 1–10. They were also asked to indicate whether they would choose the same procedure again and if they would recommend the procedure to a close friend or family member.

The RSES is composed of a continuum of self-worth statements and is designed to assess feelings of self-worth and self-acceptance. Subjects are instructed to rate each item, using a 4-point scale ranging from *strong agreement* to *strong disagreement*. The total score ranges from 10 to 40, with higher scores indicating higher self-esteem.

Objective Aesthetic Evaluation

Three standardized digital photographs were taken of each patient showing frontal, left oblique, and right oblique views. Each photograph was then assessed by two surgeons, a female oncological surgeon and a male plastic surgeon. Photographs of the reconstructed breast were compared with photographs of the contralateral breast, using a study-specific questionnaire consisting of 14 items. The questionnaire assessed several cosmetic determinants such as aesthetic result, size, shape, symmetry, nipple–areola complex, color, and scar appearance. In case of bilateral surgery, both breasts were evaluated. Items were given a score of 1–10, with higher scores representing better results.

Subgroup Analysis

A subgroup analysis was conducted with subgroups comprising patients with previous mastectomy, patients with oncological or prophylactic mastectomy, and patients with uni- or bilateral reconstruction. Self-esteem and satisfaction were compared in these subgroups.

Statistical Analysis

Data are presented as percentages, medians with ranges, and means. Spearman's correlation coefficient was used to analyze correlation between patient satisfaction and self-esteem. The Mann-Whitney *U* test was used for the statistical analysis of nonparametric continuous data. The Friedman and Wilcoxon test was used to analyze any significant differences between subgroups. Significance was set at $p < .05$. Analyses were performed using Statistical Package For Social Sciences (SPSS) for Windows version 15.0 (SPSS Inc., Chicago, IL).

RESULTS

Study Population

Thirty-eight patients were included with a total of 57 primary breast reconstructions. A total of 31 patients (91%) completed and returned the questionnaire by mail. The average age at the time of reconstruction was 50.7 years (range, 30–65 years).

The mean follow-up was 20.3 months (range, 7–35 months). In 24 women the indication for surgery was breast cancer and in 7 women the indication was *BRCA* gene mutation. Sixteen patients underwent bilateral reconstruction. In the bilateral reconstruction group, 5 patients underwent "combined bilateral reconstruction." "Combined bilateral reconstruction" refers to a breast reconstruction consisting of a primary reconstruction on one side and a secondary or tertiary reconstruction on the contralateral side, both performed during the same operative procedure. In the five cases mentioned, indications for reconstruction of the contralateral

TABLE 1 Clinical Patient Characteristics (N = 31)

Mean age in years (range)	50.7 (30–65)
Mean follow-up in months (range)	20.3 (7–35)
Site of immediate breast reconstruction, *n* (%)	
Unilateral	15 (46%)
Bilateral	16 (54%)
Condition requiring breast reconstruction, *n* (%)	
Oncological mastectomy	24 (77%)
Prophylactic mastectomy	7 (23%)
Adjuvant therapy, *n* (%)	
None	21 (68%)
Chemo/radiotherapy	3 (9%)
Chemo/hormonal therapy	7 (23%)

breast included prophylactic mastectomy and cancer. Complications occurred in 11 patients (36%). Whereas no complete flap loss was observed, partial flap loss did occur in three patients (10%). One patient developed a pulmonary embolism. Three patients developed an abdominal hernia and three patients developed an abdominal hematoma. Four patients required surgical revision of the reconstructed breast because of skin necrosis. Clinical characteristics are shown in Table 1.

Aesthetic Satisfaction and Self-Esteem

Aesthetic satisfaction and self-esteem scores of the patients are shown in Table 2.

Primary reconstruction yielded a mean satisfaction score of 6.32 (0–10), whereas patients with previous mastectomy rated their satisfaction with a score of 7.5. The overall patient satisfaction score was 6.55. Patients were most satisfied with the contour and volume of the reconstructed breast and least satisfied with the sensation of the reconstructed breast and the abdominal scars. The Rosenberg self-esteem questionnaire showed a mean score of 32.48 (range, 10–40). A significant correlation was found between patients' self-esteem and aesthetic satisfaction (Spearman's rho, $r = .551$, $p = .001$). Twenty-five women (81%) were content with their decision to undergo this procedure, and 27 women (87%) would recommend this operation to a close friend or family member.

TABLE 2 Aesthetic Satisfaction of the Patient

Patient satisfaction	*N*	Mean score (0–10)	Median (0–10)
Breast			
Contour	39	6.00	7
Volume	39	6.08	7
Sensation	39	4.33	5
Symmetry of volume	31	5.58	6
Symmetry of contour	31	5.90	6
Nipple–areola			
Symmetry	20	6.68	7
Size	20	7.05	7
Color	20	7.10	7.5
Scars	31		
Breast	31	6.00	6
Abdominal	31	5.55	5
Total score satisfaction	31	6.55	7

Table 3 shows the results of the objective aesthetic assessment as carried out by the surgeon and the plastic surgeon. The photographic assessment included 22 patients. A minority of patients were unwilling to participate in the assessment of aesthetic satisfaction, mainly because of long distances between their hometown and the hospital.

In general, the plastic surgeon was most satisfied with the aesthetic result followed by the surgeon and then the patient. These differences were significant in the majority of items evaluated.

Subgroup Analysis

The analyzed subgroups comprised women with previous mastectomy, oncological or prophylactic mastectomy, and unilateral or bilateral reconstruction. Table 4 summarizes and compares aesthetic satisfaction and self-esteem data for these subgroups. Women with a previous mastectomy of the contralateral breast showed significantly higher satisfaction scores than women who had no previous mastectomy (primary reconstruction). Abdominal scars were rated significantly lower in the bilateral reconstruction group than in the unilateral reconstruction group. Self-esteem was found to be significantly higher in women who underwent mastectomy for breast cancer than women who underwent prophylactic mastectomy.

DISCUSSION

The essential role of breasts in female psychosexual development signifies its vast implications in the emotional life of any woman. Indeed the negative effects of mastectomy on body image, sexuality, and patients' feelings of femininity have been described extensively (Anderson et al., 1994; Bard & Sutherland, 1995a; Bransfield, 1982; Clifford, 1979; Fobair et al., 2006; Goldberg et al., 1984; Magistrato et al., 1982; Renneker & Cutler, 1952; Teimourian & Adham, 1982). Similarly, the psychosocial benefits of autologous breast reconstruction have been documented manifold, albeit using different operative techniques and applying different measurement scales

TABLE 3 Aesthetic Satisfaction by Patient–Surgeon–Plastic Surgeon[a]

		Mean score (0–10)			
	N	Patient (P)	Surgeon (S)	Plastic surgeon (PS)	*p*[b]
Breast					
Contour	27	6.00	6.70	7.63	**.001**
Volume	27	6.11	7.07	7.93	**.004**
Symmetry volume	22	5.64	7.59	7.09	**.006**
Symmetry contour	22	5.95	7.00	7.55	**.001**
Nipple–areola					
Symmetry	12	7.50	7.67	7.92	.358
Size	12	8.08	7.92	8.92	**.004**
Color	12	8.00	7.20	8.08	.109
Scars					
Breast	22	5.95	7.09	7.41	**.015**
Abdominal	21	5.67	7.00	7.81	**.000**
Total score satisfaction	22	6.68	6.73	7.95	**.000**

[a]Significant scores are printed in bold.
[b]Using Friedman test.
[c]Using Wilcoxon test.

(Damen et al., 2010; Markopoulos et al., 2009; Nano et al., 2005; Noyan et al., 2006; Rubino et al., 2007; Sabino Neto et al., 2007; Veiga et al., 2010).

The current analysis contributes to existing literature in several important respects. First, the in- and exclusion criteria applied make this patient population a relatively heterogeneous group representative of women undergoing DIEP flap breast reconstruction in the Netherlands. Second, we evaluated and compared both patients' and surgeons' satisfaction with the aesthetic result after reconstruction. Most notably, however, we measured self-esteem after breast reconstruction, using the RSES comparing the outcome to previously defined self-esteem levels in the general Dutch female population.

The RSES has been applied in several studies involving breast reconstructive surgery (Markopoulos et al., 2009; Noyan et al., 2006; Rubino et al., 2007; Sabino Neto et al., 2007; Veiga et al., 2010).

These studies evaluated self-esteem outcomes in different therapies, including mastectomy without reconstruction, mastectomy with subsequent reconstruction, correction of breast asymmetry, and breast-conserving therapy (BCT).

While the findings in these studies underline the beneficial effect of breast reconstruction, they do show a slight tendency toward higher self-esteem in BCT compared to mastectomy with breast reconstruction. Both breast reconstruction and BCT show significantly higher self-esteem scores than mastectomy alone.

TABLE 4 Subgroup Analysis[a]

		Mastectomy in the past	No mastectomy in the past		Oncologic	Prophylactic		Unilateral	Bilateral	
	Range	(*n* = 6)	(*n* = 25)	*p*	(*n* = 24)	(*n* = 7)	*p*	(*n* = 15)	(*n* = 16)	*p*
Self-esteem	10–40	35.33	31.80	.153	33.88	27.71	**.005**	33.33	31.69	.275
Total satisfaction	0–10	7.50	6.32	**.049**	6.58	6.43	.361	6.60	6.50	.853
Symmetry contour	0–10	6.17	5.84	.723	6.00	5.57	.582	6.33	5.50	.246
Symmetry volume	0–10	6.00	5.48	.818	5.67	5.29	.791	5.80	5.38	.614
Scars breast	0–10	6.50	5.88	.819	6.21	5.29	.386	6.67	5.58	.058
Scars abdominal	0–10	6.67	5.28	.121	6.00	4.00	**.007**	6.33	4.81	**.022**

[a]Significant scores are printed in bold. Mann–Whitney *U* test.

The concept of self-esteem, its relation to body image, and psychological well-being remain complex and difficult to comprehend. Self-esteem is the evaluative element of self-concept, known to be an important determinant to psychological well-being (Tarlow & Haaga, 1996). In fact, low levels of self-esteem as depicted by low scores on the RSES have shown to be correlated to affective disorders such as a depressive episode (Aspinwall & Taylor, 1992; Brown & Dutton, 1995; Halamandaris & Power, 1997).

The RSES is a valid and reliable scale composed of a continuum of self-worth statements and is widely used to assess feelings of self-worth and self-acceptance. Its uncomplicated language and brevity combined with its relative simplicity and accessibility make it favorable for multilingual translations (Schmitt & Allik, 2005). Our patient population scored an average of 32.48 on the RSES, which is comparable to the average score of the Dutch population (Schmitt & Allik, 2005).

Pursuant to this finding, we found the majority of women (>80%) to be content with their decision to undergo this procedure and approximately 90% would recommend it to a close friend or family member. These figures are highly comparable with recent studies (Damen et al., 2010; Damen, Mureau, Timman, Rakhorst, & Hofer, 2009).

In assessing patients' satisfaction, we found an overall score of 6.55 on a scale of 1–10. This score is relatively low compared with scores of 8.4 (Damen et al., 2010) and 7.8 (Visser, Damen, Timman, Hofer, & Mureau, 2010) obtained in other studies. In contrast to our patient population, the two studies mentioned had a population consisting of patients with mostly secondary (Damen et al., 2010) and tertiary reconstructions (Visser et al., 2010).

Notably, we observed a significantly lower satisfaction score in patients with no previous mastectomy (6.32) compared with patients with previous mastectomy (7.50; $p = .049$; Mann–Whitney U test). Patients with no previous mastectomy composed the majority of our population (80.3%), which explains the overall satisfaction score of 6.55.

There are conflicting reports regarding patient satisfaction after immediate and delayed reconstruction. Whereas some studies found patient satisfaction to be unaffected by the timing of reconstruction (Andrade, Baxter, & Semple, 2001; Aspinwall & Taylor, 1992; Bard & Sutherland, 1955b; Brown & Dutton, 1995; Damen et al., 2009, 2010; Guyomard, Leinster, Wilkinson, Servant, & Pereira, 2009; Halamandaris & Power, 1997; Schmitt & Allik 2005; Tarlow & Haaga, 1996; Visser et al., 2010), a recent study did report patients with delayed reconstruction to express significantly higher levels of satisfaction with the outcome of reconstruction (Guyomard et al., 2009). Indeed, a patient having consciously experienced the mutilating effect of mastectomy would predictably have higher appreciation for the outcome of delayed reconstruction than a patient with immediate reconstruction who compares the reconstructive outcome with the natural breast.

Not surprisingly, measures of the RSES were found to be significantly correlated to patients' satisfaction (Spearman's rho, $r = .551$, $p = .001$).

The patients' subjective evaluation of aesthetic result was less positive than the evaluation by both the surgeon and the plastic surgeon. This appears to contradict findings of the previously mentioned studies (Andrade et al., 2001; Aspinwall & Taylor, 1992; Bard & Sutherland, 1955b; Brown & Dutton, 1995; Damen et al., 2009, 2010; Guyomard et al., 2009; Halamandaris & Power, 1997; Schmitt & Allik 2005; Tarlow & Haaga, 1996; Visser et al., 2010) in which patients expressed more satisfaction with the aesthetic outcome than the surgeon. It is plausible that the previous arguments explaining lower patient satisfaction in this study also apply to the discrepancy in patients' and surgeons' satisfaction.

The male plastic surgeon was generally more satisfied with the aesthetic result than the female oncologic surgeon. Although this difference may be gender related, it should be taken into account that in judging his own results, assessment by the plastic surgeon may have been subject to bias. It is advisable for future studies to avert potential confounders of this kind by including more medical experts of both genders in the evaluation of aesthetic outcome. Ideally, the judging panel should have no affiliation to the patient or the medical experts involved in treatment.

In the current study, women with prophylactic mastectomy and subsequent bilateral reconstruction scored significantly lower on the RSES compared with women with unilateral mastectomy and unilateral reconstruction (33.88 vs. 27.71; $p = .005$; Mann–Whitney U test). Several factors may contribute to this discrepancy. First, the more invasive nature of bilateral mastectomy and reconstruction would predictably have a more profound impact on body image and self-esteem. Second, we found postoperative complications to occur more frequently in women who underwent bilateral reconstruction. In accordance with previous studies, we found complications to be negatively correlated to patient satisfaction (Andrade et al., 2001).

Furthermore, "combined" reconstruction might render both breasts more prone to symmetrical discrepancy. As such, the five cases that underwent "combined" bilateral reconstruction may have been less satisfied with the cosmetic outcome of reconstruction, which in turn might have had a negative impact on the patients' satisfaction score in the bilateral reconstruction group.

A concomitant factor that may, in part, explain the lower self-esteem found in the bilateral reconstruction group is a varying magnitude of psychological

adaptation to mastectomy between the unilateral and bilateral reconstruction groups. Predictably, psychological adaptation to an upcoming mastectomy would be more prominent in women diagnosed with breast cancer than in women with *BRCA* gene mutations alone. The diagnosis of breast cancer may cause a shift in thinking of the breasts as a prized possession toward viewing it as a foreign body that threatens life. This may ease acceptance of mastectomy and its consequences (Bard & Sutherland, 1995b) This psychological adaptation is probably less profound in women undergoing prophylactic mastectomy. As such, mastectomy and subsequent physical disfigurement, even though corrected through reconstruction, are more likely to cause negative perceptions of body image and to have a higher impact on self-esteem in patients who undergo bilateral prophylactic mastectomy than in patients who undergo unilateral mastectomy.

The primary aim of our study was to assess patients' self-esteem after breast reconstruction, using the Dutch female population as a reference. As such, our approach to studying self-esteem outcomes did not include an assessment of preoperative baseline patient psychosocial characteristics. This precludes detecting the potential effect of major life events such as family illness, personal illness, and divorce on patient-reported outcomes of satisfaction and self-esteem.

CONCLUSION

The findings of the current study underline the psychological benefit of DIEP flap breast reconstruction. Self-esteem levels after DIEP flap breast reconstruction proved comparable to previously defined self-esteem levels in the general Dutch female population. Furthermore, we found self-esteem to be significantly correlated to the degree of satisfaction with reconstructive outcome. The timing of reconstruction was found to be of significant influence to short-term patient satisfaction. The results of the current study confirm and expand the findings of previous studies, that is, breast reconstruction improves a patient's psychological well-being. The relationship between reconstructive outcome, self-esteem, and psychological well-being, however, remains difficult to comprehend and requires investigation in more detail in future studies.

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