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The impact of complications on function, health, and satisfaction following abdominally based autologous breast reconstruction: A prospective evaluation☆

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Summary *Background:* The impact of surgical complications following autologous reconstruction on abdominal strength, health, and satisfaction is not completely understood. We prospectively examined the effect of complications on these aspects in patients undergoing abdominally-based autologous reconstruction.
Methods: A prospective study of patients who underwent autologous breast reconstruction between 2005 and 2010 was performed at a single teaching hospital. Patients enrolled in the study completed an abdominal strength functional assessment, the Short Form 36 (SF-36), and a satisfaction survey. Data were obtained at preoperative, early (<90 d), intermediate (90–365 d), and late (>365 d) follow-up visits. Patients who experienced surgical complications were compared with patients who did not. A subgroup analysis examined the specific impact of abdominal complications.
Results: Overall, 97 enrolled patients had preoperative, early and intermediate follow up. Forty of these patients had late follow-up. Fifty-six (58%) experienced surgical complications. After reconstruction, the complications group had decreased upper abdominal strength and function scores through early ($p = 0.009$, $p = 0.01$) and intermediate ($p = 0.01$, $p = 0.06$) follow-up. SF-36 physical health ($p = 0.053$) trended towards being lower in the early follow-up period. The complications group was less satisfied with the overall cosmetic result ($p = 0.01$) and shape of breasts ($p = 0.02$) through intermediate follow-up. At late follow-

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up, both cohorts recovered to baseline values in all study aspects. Patients with abdominal complications alone followed similar trends, with decreased upper abdominal strength and FIM scores through intermediate follow up.

Conclusions: Having a major postoperative complication can significantly impact early physical health, mental health, abdominal strength, and patient satisfaction. Beyond one year, recovery towards baseline may occur in the majority of patients.

Level of Evidence: Prognostic/Risk Study, Level II.

Introduction

Autologous breast reconstruction is the gold standard in achieving a naturally appearing, aesthetically pleasing breast after mastectomy.[1–6] Rates of major complications such as flap loss are low, yet rates of minor complications can impact significant portions of patients following reconstruction.[7–9]

Recent studies have examined the physical and mental impact of autologous reconstruction, providing a greater understanding of the impact of autologous reconstruction on abdominal wall function[10–12] and psychometric variables. Furthermore, abdominally-based tissue transfer has been shown to be safe and associated with satisfaction in patients with advanced age (≥60 years).[1,12,13] Conversely, this method of reconstruction can be associated with higher rates of wound complications,[14] an issue which is a particular problem for obese patients.[15–17] The impact of complications following autologous reconstruction on patient satisfaction and health however, is not completely understood. Studies suggest that complications can adversely impact patient satisfaction,[2,18,19] yet no study to date has prospectively examined this in autologous reconstruction patients.

Given the apparent benefits of autologous reconstruction but the lack of data examining the impact complications exert on overall patient health, well-being, and satisfaction, the purpose of this study was to prospectively examine the effect of surgical complications on health and satisfaction in patients undergoing autologous reconstruction utilizing tissue from the abdomen.

Methods

This study is part of a prospective, blinded, cohort study assessing abdominal strength, physical health, mental health, and patient satisfaction in patients undergoing abdomen-based free flap breast reconstruction.[20,21] All patients scheduled for autologous free flap breast reconstruction utilizing abdominal tissue by the senior author (JMS) between 2005 and 2010 were eligible to enroll in this IRB approved prospective study. Enrolled patients completed a preoperative evaluation, which included an abdominal strength functional assessment and a version of the Short Form 36 (SF-36). The abdominal evaluation examined three aspects of the abdominal wall: upper abdominal (UA) strength, lower abdominal (LA) strength, and a measure of functional independence (FIM), which assessed a patient's ability to sit up from a supine position (Figures 1–3). The SF-36 is a health survey asking thirty-six questions to produce eight scales, which are then aggregated to produce a summary physical health score and a summary mental health score. Following surgery, participants were examined at each subsequent postoperative visit for abdominal strength, the SF-36, and a satisfaction survey which assessed both functional and aesthetic satisfaction.

Data were obtained at preoperative, early (<90 days), intermediate (90–365 days), and late (>365 days) follow-up visits. Patients with at least one post-operative visit in both the early and intermediate periods were included; patients who had multiple visits within a given follow-up interval had their data averaged for that timeframe. All enrolled women who underwent deep inferior epigastric artery perforator flap (DIEP), superficial inferior epigastric artery flap (SIEA), or muscle-sparing free transverse rectus abdominis myocutaneous flap (msfTRAM) procedures between 9/2005 and 8/2010 with preoperative and follow up data were included in this analysis. Patients without follow up were excluded.

A detailed review of hospital and office records was performed for each enrolled patient and included the following: preoperative history and physical, operative reports, discharge summaries, outpatient clinic notes, and laboratory data. Additionally, an institutional hospital database was queried for medical complications associated with each patient's initial reconstructive hospitalization. Additionally, we limited the study cohort to patients operated on at the main teaching hospital of the health system.

Specific variables examined included: baseline patient characteristics (age, body mass index [BMI], hypertension [HTN], chronic obstructive pulmonary disease [COPD], hyperlipidemia [HL], active smoking, coronary artery disease [CAD], peripheral arterial disease [PAD]), oncologic history (pre- and postoperative chemotherapy, and prior radiation), reconstructive details (immediate versus delayed, unilateral versus bilateral, flap type), intraoperative complications (venous or arterial thrombosis), and postoperative surgical complications (flap loss [partial and total], delayed breast or donor site wound complications, infection, seroma, and hematoma). Delayed wound healing at the abdominal donor site and mastectomy skin was defined as skin necrosis or wound breakdown necessitating topical care or dressing changes for more than three weeks. Fat necrosis was defined as a palpable firmness greater than 1 cm in diameter. Partial flap loss was defined as flap loss or atrophy up to 50 percent but not requiring