Systematic Review on the Patient-Reported Outcomes of Tissue-Expander/Implant vs Autologous Abdominal Tissue Breast Reconstruction in Postmastectomy Breast Cancer Patients

Bernice Tsoi, BSc, MSc, PhD(cand), Natalia I Ziolkowski, BCom, BSc, MD, Achilleas Thoma, MD, MSc, FACS, Kaitryn Campbell, BEd, MLIS, Daria O'Reilly, BSc, MSc, PhD, Ron Goeree, BA, MA

Given recent advances in the diagnosis and treatment of breast cancer, its mortality rates have fallen.[1] Consequently, issues relating to the quality of survivorship have become increasingly important. For most women, the threats, fears, and losses associated with the treatment of breast cancer not only concern their health and survival, but further include concerns about body image, sexuality, self-esteem, and social life. Focus in the management of breast cancer has therefore expanded to not only include survival but also restoration of a patient's quality of life after cancer.

In particular, mastectomy may lead to psychosocial problems such as anxiety, depression, poor body image, and impaired sexual function.[2,3] Evolving surgical techniques have encouraged recommendations proposing that the optimal management of mastectomy patients incorporates consideration of both oncologic principles and esthetic outcomes.[4] Breast reconstruction after mastectomy has become an available option for most women as a means to improve quality of life and well-being. The existing literature supports the notion that reconstruction is one of the most important determinants of long-term health, patient satisfaction, functional and psychosocial well-being in breast cancer patients, when compared with mastectomy-alone patients.[5,6] Consequently, breast reconstruction has evolved from simply being considered a cosmetic procedure toward becoming an integral aspect in the management and the long-term recovery of patients with breast cancer.

For patients and their health care providers, it is important to consider patient-reported outcomes (PROs) when navigating through the complex decision-making process in the management and treatment of breast cancer. Outcomes research provides patients and physicians with objective and reliable insight into the appropriateness and effectiveness of medical interventions to direct treatment decisions. As patients become more actively involved in directing their own health care, patient satisfaction offers a means to evaluate and compare options based on previous patients' views. Furthermore, in the existing reimbursement environment, patient satisfaction has increasingly been used as a quality indicator for policy formulation.[7-9]

Existing systematic reviews have so far focused on comparing PROs of patients receiving breast reconstruction after mastectomy to mastectomy alone.[10,11] In reality, on deciding to undergo reconstruction, patients and clinicians must consider a multitude of factors, such as the timing and the reconstruction technique. Making a well-informed decision often proves to be a daunting task even for experienced surgeons and highly educated patients. Studies exploring the issue of the timing of reconstructive surgery have begun to emerge,[12,13] although studies in the latter issue, comparing how PROs differ across approaches to reconstruction, are lacking. A systematic review of the existing literature would be optimal to assist in guiding the decision on selecting the approach to reconstruction that is based on the best available, comparative clinical evidence.[14]

Two major types of postmastectomy breast reconstruction procedures exist: prosthetic implant-based and autologous

CME questions for this article available at http://jacscme.facs.org

Disclosure Information: Authors have nothing to disclose. Timothy J Eberlein, Editor-in-Chief, has nothing to disclose.

Bernice Tsoi is supported through an Award from the Father Sean O'Sullivan Research Centre, St Joseph's Healthcare Hamilton and the CIHR Drug Safety and Effectiveness Cross-Disciplinary Training program.

Abstract presented at the Canadian Society of Plastic Surgeons 67th Annual Conference, Calgary, AB, June 2013.

Received November 27, 2013; Accepted February 4, 2014.

From the Department of Clinical Epidemiology and Biostatistics (Tsoi, Thoma, Campbell, O'Reilly, Goeree), the Division of Plastic Surgery (Thoma) and the Surgical Outcomes Research Centre (Thoma), Department of Surgery, McMaster University; and the PATH Research Institute, St Joseph's Healthcare Hamilton (Tsoi, Campbell, O'Reilly, Goeree), Hamilton, Ontario, Canada; and the Second Department of General, Vascular and Oncologic Surgery, Medical University of Warsaw, Warsaw, Poland (Ziolkowski).

Correspondence address: Bernice Tsoi, BSc, MSc, PhD(cand), Programs for Assessment of Technology in Health (PATH) Research Institute, 25 Main St West, Suite 2000, Hamilton, ON L8P 1H1, Canada. email: tsoib@mcmaster.ca

ISSN 1072-7515/14/$36.00
http://dx.doi.org/10.1016/j.jamcollsurg.2014.02.011

Abbreviations and Acronyms

AAT = autologous abdominal tissue
FACT-B = Functional Assessment of Cancer Therapy in Breast
MBROS = Michigan Breast Reconstruction Outcomes Study
OR = odds ratio
PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PROs = patient-reported outcomes
SF-36 = Short Form 36
TE/I = tissue-expander/implant
TRAM = tranverse rectus abdominis myocutaneous

tissue-based reconstruction. Within each class, the most common approaches presently used are the 2-stage tissue-expander/implant (TE/I) and the autologous abdominal tissue (AAT) reconstruction techniques, respectively.[15] In an earlier systematic review, we explored the safety of these 2 approaches to reconstruction and found that, despite certain method-specific complications, TE/I reconstruction had a significantly higher risk of reconstructive failure and surgical site infection compared with AAT reconstruction, but lower rates of skin or flap necrosis.[16] In this study, we now explore how PROs differ over time between TE/I and AAT reconstruction in breast cancer patients after mastectomy. The AAT reconstruction techniques included any of the following: free-transverse rectus abdominis myocutaneous flap (free TRAM), muscle-sparing TRAM, deep inferior epigastric perforators flap (DIEP), superficial inferior epigastric artery flap (SIEA), pedicled-TRAM, or any variations of these.

METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline was followed throughout the design, implementation, analysis, and reporting of this systematic review and this review is registered with PROSPERO (CRD42012002942).

Search strategy

The process undertaken to identify published, peer-reviewed breast reconstruction studies is summarized in Figure 1. The following databases were searched: MEDLINE (1946—present; In-Process and Other Non-Indexed Citations); EMBASE (1996—present); Cochrane Library (Issue 4 of 12, April 2012); PubMed (for non-Medline records); and ProQuest Dissertations and Theses. Searches were restricted to the English language, with the search strategy based on controlled vocabulary terms such as the National Library of Medicine's Medical Subject Headings and relevant keywords (Table 1). Articles were restricted to those published from January 2000, with the latest search being conducted on August 26, 2013, to identify articles reflecting current clinical practice. This was particularly important given the continuous refinements to autologous tissue techniques and improvements in prosthetic technologies. References of relevant publications included after full-text screening were hand-searched for additional citations. If necessary, authors were contacted with a request to supply missing information.

Only studies examining PROs between TE/I and AAT reconstruction were eligible, meaning that studies that assessed reconstruction outcomes without a comparison group were excluded. The study population had to consist of women undergoing mastectomy for breast cancer (ie, studies with males or patients receiving prophylactic mastectomy were excluded). Research efforts that evaluated outcomes from a surgeon's perspective were not the focus in this study because a patient's perspective may differ significantly from a clinician's.[17] Papers had to measure outcomes that were patient-reported, including clinical and psychosocial outcomes, as either the main outcome or as a prominent feature of the overall study. Studies that reported unsolicited patient feedback were not included.

If any studies resulted in multiple publications, we reviewed both the primary and secondary papers as long as the focus of the PROs differed (eg, esthetic satisfaction, psychosocial satisfaction, pain). A sample size greater than 10 patients per study arm was necessary for inclusion because this would exclude case reports or case series. Studies in which data could not accurately be extracted were also excluded.

Titles and abstracts of the studies identified from the search strategy were independently screened for inclusion by 2 authors (BT, NZ) based on the predefined, previously mentioned criteria. The full text of each potentially eligible study was then independently reviewed by both reviewers. In cases of disagreement, decisions were reached by consensus.

Data extraction

A standardized data abstraction form was used to record the following information regarding each relevant study: study reference details (eg, first author, year of publication); description of setting; selection criteria; patient numbers; response rates; demographic and clinical characteristics of study participants; and outcome(s) of interest (ie, methods and results). The outcomes measures examined the following domains: patient satisfaction (eg, overall or esthetic satisfaction), quality of life, psychosocial or functional status, pain, and willingness to recommend breast reconstruction to others.