Skin-Sparing Mastectomy: A Survey Based Approach to Defining Standard of Care

JEANNIE SHEN, M.D.,* JOSHUA ELLENHORN, M.D.,† DAJUN QIAN, PH.D.,† DAVID KULBER, M.D.,‡ JOEL ARONOWITZ, M.D.‡

*From *UCLA Pasadena Oncology, Pasadena, California; †City of Hope Medical Center, Duarte, California; and ‡Cedars-Sinai Medical Center, Los Angeles, California*

Skin-sparing mastectomy (SSM) followed by immediate reconstruction has been advocated as an effective treatment option for patients with early-stage breast carcinoma. It markedly improves the quality of breast reconstruction through preservation of the natural skin envelope and a smaller incision. The purpose of this study was to investigate general surgeons' attitudes towards SSM. A postal questionnaire survey of California general surgeons was conducted regarding SSM. Of 370 respondents who stated they performed breast cancer surgery, 331 perform mastectomy for cancer with planned immediate reconstruction. Ninety per cent of respondents did not feel that SSM resulted in higher rates of local recurrence. In addition, 70 per cent felt that the cosmetic results of immediate breast reconstruction after SSM were better than those after a standard mastectomy. Despite this, only 61 per cent perform SSM in most cases when immediate breast reconstruction is planned. The majority of general surgeons perform SSM and therefore it should be considered standard of care. Despite a growing body of literature demonstrating high rates of patient satisfaction and long-term oncologic safety with SSM, there remains significant variation in practice patterns among general surgeons. Additional effort in general surgery education regarding the feasibility and safety of SSM is needed.

SCREENING GUIDELINES AND increased public awareness have led to the earlier detection of breast cancer in the United States. Today, the majority of newly diagnosed breast cancer cases are early stage. For many of these women, breast conservation therapy (lumpectomy followed by radiation) is the preferred modality of surgical treatment. However, several factors affect the type of breast cancer surgery performed. In some cases, lumpectomy is not feasible due to the extent of cancer involvement. In other cases, the patient herself may decline breast conservation and choose a mastectomy.

For women who choose a mastectomy, improvements in the surgical technique of mastectomy and plastic reconstructive surgery have offered them the opportunity to avoid disfigurement and improve their body image. One of the most significant advances is the introduction of the skin-sparing mastectomy (SSM). First described in 1991, a skin-sparing mastectomy is an operation in which all of the breast tissue, usually including the nipple areolar complex, is removed through a limited circumareolar incision, thus preserving the inframammary fold and integrity of the natural skin envelope.[1] In avoiding the transverse scar, SSM minimizes the more obvious medial scar and results in much less shape distortion of the breast reconstructed with implant, expander, or flap. Studies have consistently demonstrated improved patient satisfaction after SSM and immediate breast reconstruction as compared with standard mastectomy (via a transverse elliptical incision).[2, 3] In addition, initial concerns over an increased risk of local recurrence have largely been dismissed due to the growing body of literature demonstrating long-term oncologic safety.[4–6] Despite this evidence, adoption of the SSM has been slow. In this study, we sought to study the practice patterns of general surgeons with regards to mastectomy for breast cancer and investigate their attitudes towards SSM and immediate breast reconstruction.

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Address correspondence and reprint requests to Jeannie Shen, M.D., 55 East California Boulevard, Suite #100, Pasadena, CA 91105. E-mail: jeannie@jeannieshenmd.com.

Methods

Twenty-seven hundred general surgeons were contacted with a postal questionnaire to determine their mastectomy practice patterns and opinions regarding

the feasibility, safety, and cosmetic outcomes after skin-sparing mastectomy and immediate breast reconstruction. The general surgeons were identified by the Medical Marketing Service, Inc. Four hundred and fourteen surgeons (15.3%) responded. Three hundred and seventy stated they performed breast cancer surgery and these formed the study population. Response data were collected and entered into a database. Descriptive frequency analysis was conducted to evaluate the responses. Factors that might affect surgeons' attitudes towards the feasibility, safety, and cosmetic outcome of skin-sparing mastectomy and immediate reconstruction were collected and assessed using likelihood ratio tests for discrete variables. Statistical comparisons between groups were assessed by Fisher's exact test. All comparisons were two-tailed. A P value of 0.05 or less was considered statistically significant.

Results

Surgeon Demographics

Surgeon characteristics are summarized in Table 1. The majority of respondents were male (78%), in private practice (70%), and between the ages of 30 and 60 (75%).

Practice Patterns

Of the 370 surgeons who do breast cancer surgery, 331 (89%) stated they perform mastectomy with immediate reconstruction. In these cases, 256 surgeons (70%) use a skin-sparing approach in some or most cases where immediate reconstruction is planned. Seventy-five surgeons (20%) use a transverse elliptical incision despite the fact that immediate reconstruction is planned.

TABLE 1. *Surgeon Demographics*

Characteristic	Number of Patients (%)
Gender	
Female	80 (22)
Male	290 (78)
Age (years)	
<30	3 (1)
31–40	72 (19)
41–50	91 (25)
51–60	114 (31)
61–70	75 (20)
>70	15 (4)
Practice setting	
Private practice	260 (70)
Academic	30 (8)
Mixed private practice/academic	26 (7)
Health maintenance organization	54 (15)

Surgeons' Attitudes towards Feasibility, Safety, and Cosmetic Outcome

Two hundred and sixty-two surgeons (71%) believe that an oncologically sound mastectomy can be performed through a limited circumareolar (skin-sparing) incision, though 25 per cent did express concern over a greater risk of flap necrosis. The majority (90%) of general surgeons agree that an SSM is an oncologically safe operation, which does not result in a higher risk of local recurrence. In cases where a previous excisional biopsy has been performed, only 8 per cent of surgeons feel that excision of the previous biopsy incision is mandatory. Two hundred and fifty-seven surgeons (70%) responded that the cosmetic results of immediate breast reconstruction after SSM are substantially better than the results after a standard mastectomy via a transverse elliptical incision.

Variations in Practice Patterns and Attitudes Based on Practice Setting

Differences in practice patterns and opinions regarding SSM are summarized in Table 2. Private practitioners use an SSM much less often when compared with those general surgeons practicing in either an academic, mixed private/academic, or Health Maintenance Organization setting, and these differences were statistically significant (61% *vs* 83%, $P = 0.02$; 88%, $P \leq 0.01$; and 93%, $P \leq 0.01$ respectively). In addition, fewer private practice surgeons feel that an oncologically safe mastectomy can be performed through a limited circumareolar incision when compared with both surgeons in the academic setting (67% *vs* 80%, P = non-significant) and those who are working in a Health Maintenance Organization (67% *vs* 89%, $P \leq 0.01$). Private practice general surgeons are also less likely to believe that a skin-sparing approach results in better cosmesis in cases where immediate breast reconstruction is planned. Most general surgeons across all practice settings agree that skin-sparing mastectomy does not result in a higher risk of local recurrence.

Discussion

Within the last 15 to 20 years, there have been many changes in the management of breast cancer. Along with changes in treatment, techniques for mastectomy and breast reconstruction have become increasingly sophisticated. Skin-sparing mastectomy followed by immediate reconstruction has been advocated as an effective treatment option for patients with early-stage breast cancer. It minimizes deformity and improves cosmesis through preservation of the natural skin envelope of the breast. This leads to improvements in psychological well-being and body image for the breast cancer patient facing a mastectomy. In a recent

TABLE 2. *Differences in Surgeons' Practice Patterns and Attitudes Based on Clinical Setting*

	Private	Academic	Mixed*	HMO
Skin-sparing mastectomy	158 (61%)	25 (83%)	23 (88%)	50 (93%)
Feasibility	174 (67%)	24 (80%)	16 (62%)	48 (89%)
Higher recurrence	29 (11%)	3 (10%)	3 (12%)	3 (6%)
Improved cosmesis	166 (64%)	29 (97%)	20 (77%)	42 (78%)

* Mixed setting denotes a combination of private practice and academic.
HMO, Health Maintenance Organization.

study from Princess Grace Hospital in London, Salhab and colleagues[3] evaluated patient satisfaction after skin-sparing mastectomy and breast reconstruction. Patient satisfaction was assessed using a detailed questionnaire including a linear visual analogue scale ranging from 0 (not satisfied) to 10 (most satisfied). The median patient satisfaction score was 10. Several other studies have shown similar high rates of patient satisfaction.[2]

After its initial introduction in the early 1990s, concerns were raised about a potential increased risk of local recurrence. However, these concerns have largely been negated by a series of single institution studies that have shown that a skin-sparing mastectomy does not result in a higher risk of local recurrence when compared with a standard mastectomy performed through a transverse elliptical incision.[4–6]

Despite the availability of breast reconstruction, the use of a skin-sparing approach is not universal. In a survey-based study conducted by Bleicher et al.,[7] an attempt was made to determine skin-sparing mastectomy attitudes and biases within different specialties and countries throughout the world. The authors polled 11,485 individuals via e-mail, including members of surgical, medical, and breast oncology societies, about skin-sparing mastectomy. Of the 1,027 respondents, 61.9 per cent stated that skin-sparing mastectomies are performed at their institution. Although 77.8 per cent of respondents believed that the current published literature demonstrated that skin-sparing mastectomy does not result in a higher rate of local recurrence, 25.3 per cent of these individuals did not believe the data.

In another study of the use of skin-sparing mastectomy, Sotheran and Rainsbury[8] used a questionnaire to determine the popularity of skin-sparing mastectomy, techniques used, indications, contraindications, and outcomes in the United Kingdom. Of the 130 respondents, 77 per cent use skin-sparing mastectomy where breast reconstruction is planned. The authors noted an increase in the utilization of skin-sparing mastectomy over time, from 21 per cent in 1997 to 73 per cent in 2001. Most respondents used skin-sparing mastectomy for prophylaxis, *in situ* cancer, and early invasive disease, and avoided skin-sparing mastectomy in patients with skin tethering, where radiotherapy was planned, and in smokers.

In our study, 70 per cent of the general surgeons who responded feel that a skin-sparing mastectomy results in superior cosmetic results in cases where immediate breast reconstruction is planned, and 90 per cent believe it is an oncologically safe operation, which does not result in a higher rate of local recurrence. Nonetheless, only 67 per cent of surgeons who perform mastectomy with immediate reconstruction use a skin-sparing approach most of the time. In addition, we found differences in utilization patterns and attitudes about feasibility and cosmetic outcome based on clinical practice setting. Private practice surgeons were significantly less likely to use a skin-sparing mastectomy compared with surgeons in other practice settings. This could be explained by the fact that they were also less likely to believe that an oncologically safe mastectomy was feasible through a skin-sparing approach or that it led to a significantly better cosmetic result.

The current study is limited by several factors, including those limitations inherent in a survey-based approach. Only 414 of the 2700 surveyed responded. Respondents may have been more likely to have an interest in mastectomy and reconstruction. In addition, the survey did not address patient selection criteria, indications, and contraindications, and the availability of plastic reconstructive surgery in the practice.

A growing body of literature demonstrates high rates of patient satisfaction and long-term oncologic safety with skin-sparing mastectomy and immediate breast reconstruction. Nonetheless, variations in practice patterns among general surgeons indicate the need to establish evidence-based guidelines for the wider practice of skin-sparing mastectomy and the concept of aesthetic placement of breast incisions within a keyhole pattern. Education about skin-sparing mastectomy, the accepted principles of tailoring the shape of the breast skin envelope, and the body of clinical literature regarding the efficacy of skin-sparing mastectomy is needed if the procedure is to be more widely accepted. Although universal adoption of skin-sparing mastectomy has not yet occurred, the majority of surgeons polled believe the procedure is oncologically

safe and provides a superior outcome. Skin-sparing mastectomy should therefore be considered standard of care for the patients undergoing mastectomy when immediate reconstruction is used.

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