

Twenty Years of Breast Reduction Surgery at a Veterans Affairs Medical Center

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Background: Breast reduction surgery has a high patient satisfaction rate for the treatment of symptomatic macromastia. However, complications from the surgery can significantly disrupt a woman's life due to time in the hospital, clinic appointments, wound care, time off work, and poor aesthetic outcome. Beginning July 2007, the Malcom Randall Veterans Affairs Medical Center (MRVAMC) Plastic Surgery Service in Gainesville, Florida, started using a preoperative screening protocol to help patients achieve a healthier and more favorable risk profile.

Methods: A retrospective chart review was conducted on all breast reduction surgeries performed at the MRVAMC from July 1, 2000 to June 30, 2020. Medical records were queried for all primary breast reduction surgeries performed for symptomatic macromastia. Potentially modifiable or predictable risk factors for wound complications were recorded: nicotine status, body mass index (BMI), diabetes mellitus (DM) status, skin incision pattern, and pedicle location. Records were reviewed for 3 months after surgery for local wound complications that

included: hematoma, infection, wound breakdown, skin and nipple necrosis. Major complications required an unplanned hospital admission or operation.

Results: Over the 20-year period, 115 bilateral breast reduction surgeries were performed. There were 48 wound complications (41.7%) and 8 major complications (7%). Most complications were identified in the first 7 years of the study. BMI > 32 ($P = .03$) and active nicotine use ($P = .004$) were found to be statistically significant risk factors for wound complications. DM status ($P = .22$), skin incision pattern ($P = .25$), and pedicle location ($P = .13$), were not predictors of wound complications.

Conclusions: Breast reduction surgery has a high wound complication rate, which can be predicted and improved upon so that patients can receive their indicated surgery with minimal inconvenience and downtime. This review confirms that preoperative weight loss and nicotine cessation were the appropriate focus of the MRVAMC Plastic Surgery service's efforts to achieve a safer surgical experience.

Women make up an estimated 10% of the veteran population.¹ The US Department of Veterans Affairs (VA) projected that there would be an increase of 18,000 female veterans per year for 10 years based on 2015 data. The number of women veterans enrolled in the VA health care increased from 397,024 to 729,989 (83.9%) between 2005 and 2015.² This rise in the number of enrolled women veterans also increased the demand for female-specific health care services, such as breast reduction surgery, a reconstructive procedure provided at the Malcom Randall VA Medical Center (MRVAMC) federal teaching hospital in Gainesville, Florida.

Patients who experience symptomatic macromastia will report a history of neck and shoulder pain, shoulder grooving from bra straps, inframammary intertrigo, difficulty finding clothes that fit, and discomfort participating in sports. For the treatment of symptomatic macromastia, patients report a high satisfaction rate after breast reduction surgery.³⁻⁵ Unfortunately, the complications from the surgery can significantly disrupt a woman's life due to previously unplanned hospital admissions, clinic appointments, wound care, time off work, and poor aesthetic outcome. Fac-

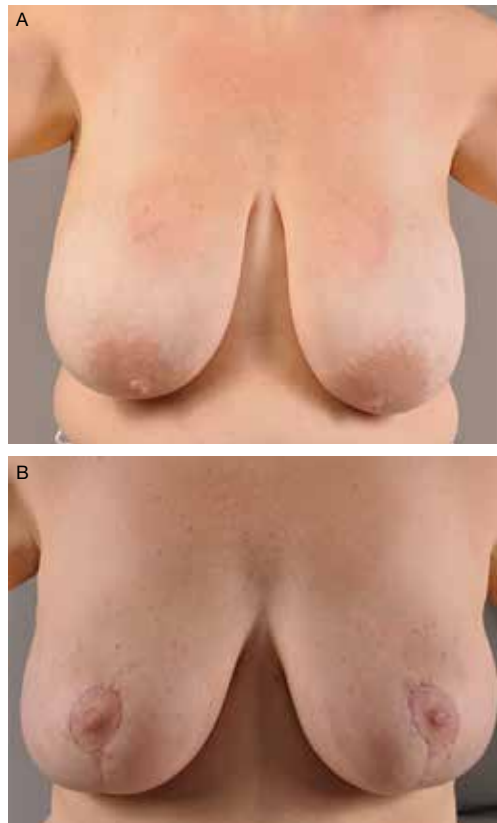
ulty awareness of a large number of complications for patients after breast reduction surgery prompted the MRVAMC Plastic Surgery Service to establish a stricter surgical screening protocol using body mass index (BMI) values and negative nicotine status to help patients be healthier and reduce the potential risk before offering surgery. A medical literature search did not find an existing study on veteran-specific breast reduction surgery.

METHODS

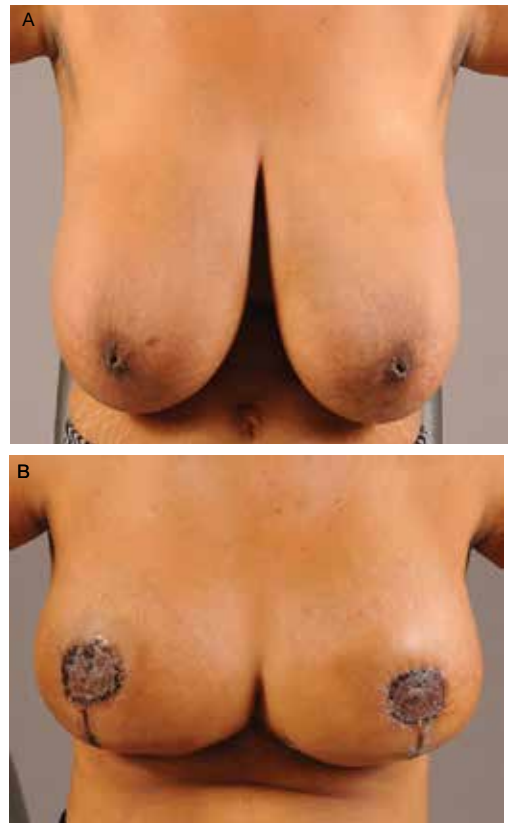
The University of Florida and North Florida/South Georgia Veterans Health System Institutional Review Board approved a retrospective chart review of all breast reduction surgeries performed at MRVAMC over a 20-year period (July 1, 2000-June 30, 2020). Electronic health records were queried for all primary bilateral breast reduction surgeries performed for symptomatic macromastia using Current Procedural Terminology code 19318. Potentially modifiable or predictable risk factors for wound complications were recorded: nicotine status, BMI, diabetes mellitus (DM) status, skin incision pattern, and pedicle location. Skin incision patterns were either vertical (periareolar plus a vertical scar from

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FIGURE 1 Wise Pattern Superior-Medial Pedicle Breast Reduction

A, preoperation; B, 6-weeks postoperation, 1285 g total reduction.

FIGURE 2 Wise Pattern Inferior Pedicle Breast Reduction

A, preoperation; B, 2-week postoperation, 1826 g total reduction.

the areola to the inframammary fold) or traditional Wise pattern (also known as anchor pattern: periareolar scar, vertical scar to inframammary fold, plus a horizontal scar along the inframammary fold) as seen in Figures 1 and 2. The pedicle is the source of blood supply to the nipple, which was documented as either from the inferior aspect or the superior or superior/medial aspect.

For this study, the blood supply from the superior and superior/medial was logged in the same category. Records were reviewed 3 months after surgery for documentation of local wound complications, such as hematoma, infection, wound breakdown, skin necrosis, and nipple necrosis. Major complications were defined as requiring an unplanned hospital admission or urgent return to the operating room. A χ^2 test using a *P* value of $< .05$ was used to determine statistical significance between the incidence of

wound complications and the individually identifiable variables.

RESULTS

One hundred fifteen bilateral breast reduction surgeries were performed at MRVAMC over a 20-year period. Patient median age was 43 years. Median combined specimen weight was 1272 g. Forty-eight (41.7%) wound complications were documented, including 8 (7%) major complications. Most complications were identified in the first 7 years of the study before the new protocol and consult template became active. The new template resulted in the local complication rate dropping from 62% (July 2000-June 2007) to 26% (July 2007-June 2020). BMI > 32 ($P = .03$) and active nicotine use ($P = .004$) were found to be statistically significant independent risk factors for wound complications. Median BMI for all patients was 30. DM status ($P = .22$),

skin incision pattern ($P = .25$), and pedicle location ($P = .13$) were not found to be predictors of wound complications (Table). There was no significant change in the incidence of major complications before and after the new protocols were enforced.

DISCUSSION

Breast reduction surgery is an elective reconstructive option to treat symptomatic macromastia. There are several accepted ways to do the reduction surgical procedure where the blood supply (pedicle) to the nipple can vary and the visible scars can be in a horizontal, vertical, or Wise pattern. Technique is usually based on surgeon training, comfort, and preference. There are several known complications specific to this operation that include asymmetry, changes in nipple sensation, unattractive scars, diminished ability to breast-feed, and wound complications.⁵⁻⁷ Wound complications include seroma, hematoma, dehiscence, infection, wound breakdown, skin necrosis, and nipple necrosis.

This study focused on wound complications with the objective of identifying and modifying risk factors. Two known risk factors documented in the literature, nicotine use and obesity, already had been addressed by our service, and results were known anecdotally but had not been previously verified. This study also looked at other potential risk factors, including the pedicle location, skin incision, and DM status.

Residents or fellows participated in all the surgeries. An outcome analysis from The American College of Surgeons National Surgical Quality Improvement Program database from 2005 to 2011 found that resident participation was associated with morbidity, including wound complications.⁸ This study was performed at a federal hospital with a complexity level 1a rating, which is designated based on the highest level of patient volume, risk, teaching, research, intensive care unit beds, and specialty services.⁹ The hospital is closely affiliated with a level 1 trauma center and teaching hospital; therefore, resident and fellow participation is not a modifiable risk factor.

This study did not find an increased risk of wound complications in patients with DM, which has been found to be an independent risk factor in a prior study.¹⁰ DM status was

TABLE Risk Factors for Breast Reduction Wound Complications

Variables	Patients, No.	Complication, No.	P value
Current nicotine use			.004 ^a
Yes	14	11	
No	101	37	
Body mass index			.03 ^a
> 32	27	16	
≤ 32	88	32	
Diabetes mellitus status			.22
Diagnosed	3	2	
Not diagnosed	112	46	
Scar pattern			.25
Wise	69	32	
Vertical	46	16	
Pedicle			.13
Inferior	52	26	
Superior or superior/medial	63	22	

^aStatistically significant.

indicated in only 3 histories, and they all had perioperative hemoglobin A_{1c} levels < 8%. There is documentation of patients receiving perioperative antibiotics in 99 out of 116 of the surgical records; however, we did not include this in the analysis because the operative reports from the first year of the study were incomplete.

Smoking is a known risk factor for local wound complications in breast reduction surgery.¹⁰⁻¹⁵ The VA has a smoking cessation program through its mental health service that provides counseling and medication treatment options, including nicotine replacement, bupropion, and varenicline. We require patients to be at least 4 weeks nicotine free before surgery, which has been previously recommended in the literature.¹⁶

Existing studies that compare the traditional Wise pattern/inferior pedicle with vertical pattern/superior medial pedicle did not find an increased risk of wound complications.¹⁷⁻¹⁹ Our study separated the different incisions from the pedicle because the surgical technique among the different surgeons in the study varied, where sometimes the traditional Wise pattern was combined with the less traditional superior-medial pedicle. We did not find a statistical difference when comparing the incisions and pedicle location, which suggests that the incision type and source of blood supply to

the nipple are not the determining factors for wound complications in the early postoperative period.

Obesity is a known risk factor for local wound complications.^{12,13,15,20-22} Studies have shown that patients who are obese benefit from breast reduction surgery; authors have argued against restricting surgery to these higher risk patients.^{4,23-25} Patients usually report decades of macromastia symptoms at consultation; so, we believe delaying the surgical procedure to get patients to a safer risk profile is in their best interest. We chose a cutoff BMI of 32 as a realistic value rather than 30, which is considered the definition of obesity. Patients at MRVAMC have access to MOVE!, a weight loss management program through primary care. We believe in being reasonable; so if a patient makes a significant improvement in her health but falls short of the required cutoff, we will still consider offering the surgical procedure after a full explanation of the surgical risks.

Wound complications, especially those that require admission or frequent appointments can seriously disrupt a patient's life, creating unnecessary hardships and expense in time lost from work, travel, and child care. MRVAMC has a catchment area the size of North Carolina; so many of our patients travel hours for their appointments. The added scars and deformity from wound dehiscence and debridement can lead to asymmetry, widened scars, and future revision operations. Multiple clinic appointments for wound care not only impact that individual patient, but also has the effect of limiting access for all patients in a health care environment with high patient volume and limited providers, operating room time, and clinic appointments. As a result, minimizing predictable wound complications benefits the entire system.

Limitations and Strengths

This retrospective review comprised multiple different surgeons, including faculty and trainees, who were involved in the consultation, surgery, and postoperative care of the patients over a 20-year period; therefore, consistency in documentation is lacking. In addition, we were limited to only the information available on the charts. For example, wound size and laterality were not consistently doc-

umented. The MRVAMC complication rate was consistent with the current literature (range, 14-52%).^{12,18,20,24}

The major strength of the study is that the veterans tend to stay within the VA, which makes complications easier to identify and follow. Patients who do not present initially to their surgeon due to travel limitations will typically contact their primary care provider or present to their local VA urgent care or emergency department provider, who will route the patient back to the surgical specialty service through the electronic health record.

CONCLUSIONS

Breast reduction surgery has a high wound complication rate, which can be predicted and improved on so that patients can receive their indicated surgical procedure with minimal inconvenience and downtime. This review confirms that preoperative weight loss and nicotine cessation were the appropriate focus of the MRVAMC plastic surgery service's efforts to achieve a safer surgical experience. We will continue to enforce our protocol and encourage patients who are interested in breast reduction surgery and fall outside the requirements to work with their primary care provider on smoking cessation and weight loss through better nutrition and physical activity.

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Disclosures

The authors report no actual or potential conflict of interest with regard to this article.

Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of *Federal Practitioner*, Frontline Medical Communications Inc., the U.S. Government, or any of its agencies.

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