A Review of Psychological Outcomes and Suicide in Aesthetic Breast Augmentation

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Summary: Aesthetic surgery is an essential component of plastic surgery and has become increasingly popular in American society. In 2002, 1.8 million surgical cosmetic procedures were performed in the United States, representing a 294 percent increase from 1992. The 1992 U.S. Food and Drug Administration moratorium on silicone breast implants arose in response to numerous reports of connective tissue disease associated with silicone gel breast augmentation and has led to a decade-long battle over the safety of silicone breast implants that continues today. Numerous scientific and epidemiologic studies of the past decade have established that there is no association between silicone breast prostheses and systemic disease. Recently, a new front has opened in the conflict regarding the safety of breast augmentation: the psychological impact of breast augmentation. Quality studies assessing the psychological characteristics of breast augmentation patients and the psychological impact of breast augmentation surgery are few and most studies are flawed in their methods. Recent reports have provided corroborating evidence to support the psychological benefits of cosmetic surgery and breast augmentation. New reports citing an increased risk for suicide among women with breast implants have brought renewed concerns but are unable to demonstrate a cause-and-effect relationship between breast implants and suicide. The present challenge is to determine whether the increased risk reported in epidemiologic studies is falsely associated with breast implants or whether it represents underlying risk factors or psychopathology in women undergoing breast augmentation that puts them at increased risk for suicide. The purpose of this article is to review the literature regarding the psychological impact of breast augmentation and assesses current scientific findings, with emphasis on the validity of suicide risk in breast augmentation patients. (*Plast. Reconstr. Surg.* 119: 401, 2007.)

Aesthetic surgery is an essential component of plastic surgery and has become increasingly popular in American society. In 2002, 1.8 million surgical cosmetic procedures were performed in the United States, representing a 294 percent increase from 1992.[1] Breast augmentation represented the third most frequently performed cosmetic surgery procedure, with approximately 237,000 breast augmentations being performed. This represents a 626 percent increase from 1992.[1] Despite the frequency with which breast augmentation is performed, the procedure has been and remains under intense scrutiny.

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Received for publication April 8, 2005; accepted April 8, 2005.

DOI: 10.1097/01.prs.0000245342.06662.00

The female breast has been an object of both individual and societal interest for centuries. The breast represents a woman's femininity, sensuality, and fertility.[2] It frequently plays a prominent role in movies, fashion, and advertising, demonstrating its relative value in female perception by society. The interplay of these factors has helped bring about women's interest in aesthetic breast surgery, the development of various surgical procedures to accomplish aesthetic breast enhancement, and continued scientific investigations to provide more predictable and precise surgical outcomes.

Aesthetic breast surgery was advanced with the introduction of the silicone gel breast implant in the early 1960s by Cronin and Gerow.[3] Prosthetic silicone breast implants heralded the modern era of breast augmentation, and variations of the original devices remain the standard for surgical augmentation of the breast today; however, along with the improvements brought by breast

implants came many challenges. Numerous reports of women developing symptoms of rheumatic disease began to surface in the 1980s.[4–6] Although these initial reports did not possess sound scientific data to support their claims, the media blitz that followed resulted in severe negative connotations for silicone breast implants. The U.S. Food and Drug Administration, in response to these reports and overwhelming publicity, held several hearings that resulted in a moratorium on the use of silicone gel implants in 1992, effectively banning their use except in specific and controlled situations.[7]

The effects of the U.S. Food and Drug Administration moratorium were spurred on by concerns for interference with cancer screening, tumorigenesis, and continued reports of autoimmune disorders.[8–22] The impact of the media and these initial reports resulted in what is referred today as the "implant crisis" of the 1990s. During this period, the volume of patients presenting for breast augmentation decreased dramatically.[23] In the past decade, a great number of epidemiologic studies have helped clear the air regarding the association of silicone breast implants and systemic disease.[20,24–54] These studies have failed to demonstrate a cause-and-effect relationship between silicone implants and systemic disease and are partly responsible for the renewed interest and increase in breast augmentation procedures performed in the "postcrisis" era.

Despite an increasing body of literature to demonstrate there is no association between breast implants and systemic disease, there is still a reluctance to declare the safety of breast implants established. Recent reports have added an additional topic of concern in this discord: the psychological impact of breast augmentation. Three recent studies investigating mortality among women with breast implants have reported an increased incidence of suicide in this group of patients compared with the general population.[55–57] Before discussing these three studies, it is important to review and understand the literature regarding the psychological characteristics of breast augmentation patients and the psychological effects and outcomes of cosmetic surgery and augmentation mammaplasty.

Despite a century-long history of attempts to surgically improve the appearance of the female breast, studies investigating the motivational factors of women seeking breast augmentation, the preoperative and postoperative psychological profiles of women undergoing breast augmentation, and the psychosocial outcomes of surgical procedures have appeared only relatively recently. Very little is known about the psychological characteristics of these patients or the psychological effect of surgery.[58–60] The basis for this lack of understanding resides in the inconsistency of results from previous studies and a failure to standardize the study methods. Sarwer et al.,[60] in a thorough review of the literature, classified these studies as those investigating demographics, preoperative characteristics, or postoperative characteristics.

Demographic information has been obtained mostly through nonstandardized reports and interviews and therefore do not allow for valuable conclusions to be drawn. Several reports have identified the breast augmentation patient as predominantly Caucasian,[61–67] to have middle to upper socioeconomic status [62–65,68,69] and to typically be in the 20- to 30-year age range.[62,63,65,66,68,70–72] More often the patient is married and has children.[62–68] Other characteristics cited in the literature include a wide variety of qualities, some favorable and others not so. Higher divorce rates, increased rates of gynecologic problems, and sexual dysfunction have been described in patients presenting for breast augmentation.[73–76] These reports have raised concerns that women presenting for breast augmentation may have underlying psychological issues that may affect surgical outcome.

Several recent prospective studies[77,78] have sought to better identify the demographics and factors that motivate women to seek breast augmentation surgery. These studies prospectively evaluated groups of women seeking breast augmentation compared with a matched control group using questionnaires to obtain psychometric measures. Breast augmentation patients reported more dissatisfaction with their breast size and reported a larger ideal breast size compared with controls. They did not display dissatisfaction with their overall body appearance. In both studies, breast augmentation patients invested more time and effort into health and fitness concerns. Didie and Sarwer[78] also demonstrated that both groups reported healthy interpersonal relationships but that breast augmentation patients reported more positive sexual functioning. Interestingly, the two studies had conflicting data regarding breast augmentation patients' investment in their appearance and the presence of appearance-related teasing. These studies have helped to eliminate some of the stereotypes per-

taining to women seeking breast augmentation, but further studies are still needed.

The importance of identifying patients with underlying psychopathology is realized in the postoperative period when patients with body image disorders return with unrealistic expectations. Preoperative study of the psychological status of breast augmentation patients has produced conflicting results. Sarwer et al.[60] have identified the methodology of these studies as a potential factor in this discrepancy. Investigations of the preoperative status have used either clinical interviews or formal psychometric assessment of the patient. Unfortunately, clinical interviews have not adhered to standardized procedures or included accepted diagnostic criteria and frequently did not use control groups for comparison. This undermines the potential for valid conclusions from these studies. In general, these studies have suggested a high degree of psychopathology in breast augmentation patients.[60,70–76] Investigations using formal psychometric measures, in contrast, have demonstrated a lower prevalence of psychopathology.[60,62,65,68] These studies also failed to effectively use standardized methods through the absence of control groups or by failing to identify the demographics of the groups.[60] As a result of the shortcomings of the studies investigating the preoperative status of breast augmentation patients, the prevalence of psychopathology is still largely unknown.

Postoperative studies have investigated patient satisfaction with surgery and attempts to evaluate psychological changes after surgery. Most studies regarding patient satisfaction report excellent results, with dissatisfaction being related to the occurrence of postoperative complications. The criticism of these studies is that they have been mostly anecdotal reports of surgeons' outcome assessments.[60,67,79–84] Interview-based studies have shown psychological benefits of breast augmentation as a result of subjective improvement in the patient's self-esteem and body image.[62,65,67,70,82,85,86] Rankin et al.[87] and Sarwer et al.[88] provided corroborating data to support the psychological benefits of cosmetic surgery. Rankin et al.[87] prospectively measured quality-of-life outcomes and selected psychological variables over a 6-month period using valid and reliable psychometric measures. One hundred five consecutive cosmetic surgery patients were assessed through four self-report questionnaires at 2 weeks preoperatively and at 1 and 6 months postoperatively. They demonstrated that cosmetic surgical procedures produce a positive psychological effect by improving quality-of-life outcomes. Patients were more self-confident, more satisfied with their appearance, and less dissatisfied with their weight, and demonstrated increased psychological well-being profiles. These benefits were present at the 1-month evaluation and improved at the 6-month evaluation. Sarwer et al.[88] prospectively assessed the changes in body image of women undergoing cosmetic surgery through standardized psychometric measures. Their results demonstrated that at 6 months postoperatively, patients reported a significant reduction in the degree of dissatisfaction with the body feature altered by surgery. Of note, they did not report a significant change in their overall body image. Sarwer et al.[88] conclude that the data from their study and that of Rankin et al. provide "growing evidence to suggest that cosmetic surgery leads to improvements in at least three areas of psychological functioning: body image, quality of life and depressive symptoms." Further studies are needed to corroborate these results.

As previously stated, three recent reports investigating mortality among women with breast implants have reported an increased incidence of suicide in this group of patients compared with the general population. In the only U.S. study, Brinton et al.[55] reported a retrospective cohort study of 13,488 patients with cosmetic implants and 3936 patients who had other types of plastic surgery. The patients were derived from 18 plastic surgery practices in the United States. Eligible women included all women who had a first bilateral augmentation mammaplasty between 1960 to 1988. Patients receiving breast implants after a diagnosis of breast cancer were excluded. Mortality rates were standardized and standardized mortality ratios (the number of observed deaths divided by the expected number of deaths based on age, race, and calendar year) were computed. The standardized mortality ratio for all causes of mortality was 0.69 (95 percent confidence interval, 0.6 to 0.8) for implant patients compared with 0.58 (95 percent confidence interval, 0.5 to 0.7) for controls, demonstrating a decreased incidence of overall death for both groups compared with the general population. Analyses of deaths between the implant and control groups established a relative risk comparison. Implant patients had a slightly increased risk for all causes of death (relative risk, 1.27; 95 percent confidence interval, 1.0 to 1.6), for all malignancies (relative risk, 1.37; 95 percent confidence interval, 1.0 to 1.9), and suicide (relative risk, 4.24; 95 percent confidence interval, 0.9 to 19.2). There was little variation in the standardized mortality ratio for the type of im-

plant; however, the standardized mortality ratio for suicide was elevated for patients with silicone gel implants (standardized mortality ratio, 1.81; 95 percent confidence interval, 1.0 to 3.2). The authors admit that, given the limited number of deaths, chance findings cannot be ruled out and conclude that, although women with breast implants had slightly higher mortality risks than patients with other types of plastic surgery, both groups had lower mortality risks than the general population. In a second study, Koot et al.[56] reported the cause-specific mortality among Swedish women with breast implants. The study included 3521 women aged 15 to 69 years who had breast implants from 1965 to 1993. Women who underwent implantation after a diagnosis for cancer were excluded. Average follow-up was 11.3 years. Standardized mortality ratios were calculated as a measure of relative risk, and patients were matched for age and calendar year with the general population. They report a 50 percent excess mortality secondary to increased risk from malignancy (standardized mortality ratio, 1.4) and suicide (standardized mortality ratio, 2.9). The excess risk from malignancy was attributed to tobacco use, which has been previously shown to be common in their cohort. Increased risk for suicide was attributed to what the authors referred to as the documented link between psychiatric disorders and patients seeking cosmetic surgery. Pukkala et al.[57] reported similar results (suicide standardized mortality ratio, 3.2) in the Finnish population.

Obviously, any study that identifies an increased risk of mortality for a surgical procedure or medical device is cause for serious concern; however, these studies must be interpreted very cautiously. Despite demonstrating a two- to threefold increase in the incidence of suicide, the absolute numbers of deaths in these studies were very small, allowing the possibility that random chance affected outcome. The literature, as previously discussed, has shown that there is no link between silicone breast implants and systemic disease. Extrapolating these data, we hypothesize that silicone breast prostheses do not cause biological disease that would provide an explanation for the increased risk for suicide. The challenge then is determining whether the increased incidence of suicide is falsely associated with breast implants or whether it is attributable to underlying risk factors and psychopathologic characteristic of breast augmentation patients.

Suicide has been correlated with many factors, including family history of suicide, conduct disorders, depressive disorders, anxiety states, alcoholism, and drug abuse.[89] Precipitating factors for suicide are very important as well and likewise very broad. Acute stress, trouble with the law, pregnancy or fear of pregnancy, social isolation, anxiety, and environmental change have all been implicated in triggering suicide.[89] Are there characteristics of augmentation mammaplasty patients that would put them at risk for suicide? Recent studies[59,60] evaluating the psychological characteristics of breast augmentation patients who used standardized psychometric methods did not demonstrate high levels of underlying abnormality. However, several studies[90–100] have suggested that women undergoing breast augmentation may possess demographic and lifestyle traits that would potentially alter their risk for suicide as compared with the general population, including cigarette smoking, alcohol intake, marital status, and parity. A recent report by Joiner[101] estimated the relative risk of suicide in the prototypical breast augmentation patient to allow a comparison of the observed suicide rates as previously reported with the expected suicide rate for this group of patients. To accomplish this task, Joiner reviewed the literature for demographic, behavioral, and other characteristics typical of breast augmentation patients. The expected suicide rate among breast augmentation patients was estimated by establishing the relative increase in risk for each factor and forming a composite of the risk estimates to arrive at an approximation of the overall suicide risk for this group of patients. Joiner estimates that the suicide rate in breast augmentation patients should be four times the general population rate. Applying this to the reports of Brinton et al.,[55] Koots et al.,[56] and Pukkala et al.,[57] all three studies have suicide rates that are less than expected for breast augmentation patients.

McLaughlin and associates[102] have reviewed the epidemiologic evidence pertaining to breast implants and suicide and state that an association of suicide with breast implants based on comparisons with the general population does not provide conclusive evidence of the cause-and-effect role for implants. They recommend further etiologic epidemiologic studies to identify whether there truly is a causal relationship. Obtaining the data is no easy task, as McLaughlin's group points out. The necessary studies would involve epidemiologic case-controlled

studies to characterize the presurgical psychiatric history of women with implants who commit suicide and to compare them with women from the same cohort with implants who do not commit suicide. Large-scale retrospective cohort studies are also needed to compare suicide rates among women with and without implants that are matched for presurgical psychiatric diagnoses and risk factors for suicide. Probably the biggest challenge to completing these studies is the medicolegal climate and privacy laws that would make obtaining the data difficult.

McLaughlin et al.[103] questioned whether the current epidemiologic data justify psychiatric consultation before breast implant surgery. In their review of the data, the strongest risk factor identified for suicide among women was a history of psychiatric illness requiring hospitalization. They extrapolated that, given the consistency of the epidemiologic data pertaining to suicide and implants and the association between suicide and psychiatric illness, psychiatric consultation is warranted in women seeking breast implant surgery. The authors did not discuss the relative risk estimates published by Joiner.

CONCLUSIONS

The literature regarding the psychological outcomes for breast augmentation remains incomplete. Recent studies demonstrating an increased risk for suicide in augmentation patients fail to identify a cause-and-effect relationship or to establish the presence of preoperative risk factors or psychopathology that would place these women at increased risk for suicide. Several quality studies have suggested that breast augmentation leads to improvements in several areas of psychological functioning, including body image, quality of life, and depressive symptoms. The report by Joiner provides valuable information to help interpret the previous studies and suggests that women undergoing breast augmentation may actually have a lower than expected rate of suicide, further supporting the psychological benefits of aesthetic breast augmentation. The data presented here are not conclusive, and further epidemiologic studies are needed to define the demographics, preoperative qualities, and postoperative psychological changes in patients undergoing augmentation mammaplasty, in addition to studies to identify potential risk factors for suicide unique to women with silicone breast prostheses. As plastic surgeons, we all want to provide the highest quality and safest possible procedures to our patients. Therefore, until such time as these data are available, screening patients for risk factors for suicide and psychopathology is prudent to allow for case-by-case psychiatric referral for patients identified as high risk before breast augmentation.

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DISCLOSURE

None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this article.

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