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Christine M. Blaine MD
Lehigh Valley Health Network

Christian R. Subbio MD
Lehigh Valley Health Network, Christian_R.Subbio@lvhn.org

Sherrine M. Eid MPH
Lehigh Valley Health Network, Sherrine.Eid@lvhn.org

Robert X. Murphy Jr, MD, MS
Lehigh Valley Health Network, Robert.Murphy@lvhn.org

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Reduction Mammoplasty Trends

A Quality and Fiscal Analysis Update

Christine M. Blaine, MD,* Christian R. Subbio, MD,* Sherrine M. Eid, MPH,† and Robert X. Murphy, Jr, MD, MS*

Background: Reduction mammoplasty remains one of the most common procedures performed by plastic surgeons today. The national health care quality and fiscal environments continue to evolve, with increasing emphasis on outpatient procedures and reduced lengths of stay (LOS). This study was designed to analyze the trends in reduction mammoplasty at our institution during the last 10 years with particular attention to LOS, complication rate, and readmission. We also evaluated the institutional fiscal implications with regard to reimbursement in the changing health care environment.

Materials and Methods: Institutional review board approval was obtained for this retrospective chart review. An analysis of all reduction mammoplasties during the last 10 years was undertaken. Admission status [same day surgery (SDS), outpatient ambulatory, observation, and inpatient], LOS, mortality, morbidity, and readmissions were documented. A financial analysis was also performed comparing trends in hospital revenue and operating income. Revenue was defined as the amount that the hospital received from all sources, whereas operating income was the revenue reduced by all costs incurred to provide services.

Results: In this population, 1779 patients were identified (SDS, 499; outpatient ambulatory or observational, 694; and inpatient, 586). Twenty patients were readmitted within 30 days. The all-cause 30-day readmission rate was 11.24 per 1000 patients. The disease-specific readmission rate was 5.06 per 1000 patients (n = 9). Only 1 patient with disease-specific complication requiring readmission had been classified as SDS. No cases of nipple compromise were identified in our study. Revenue per case was highly variable throughout the study period. In general, operating income has decreased during the last decade, despite a small increase for those patients who were truly inpatient.

Conclusions: Reduction mammoplasty is a common procedure that is safe when performed on an outpatient basis. Institutional operating income, except in the case of inpatients, continues to decrease and could pose a challenge in the future should present trends continue.

Key Words: reduction mammoplasty, quality analysis, fiscal analysis, inpatient versus outpatient, outcomes

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Reduction mammoplasty remains one of the most common procedures performed by plastic surgeons today. According to statistics published by the American Society of Plastic Surgeons, a total of 83,241 breast reductions were performed in 2010, with 36% be-

tween the ages of 45 and 54 years.¹ As has been the trend nationally in other areas of surgery, there has been an increasing trend to perform this procedure on an outpatient basis.

In 2003, Chung et al² reported that reduction mammoplasty length of stay (LOS) had decreased by nearly 50% from 2 to 1.1 days during an 8-year study period (1991–1998). Also noted was a statistically significant increase in those cases with a LOS under 24 hours, without a corresponding increase in readmission rate or complication rate. As the fiscal environment continues to evolve, there continues to be increasing pressure toward reducing LOS even further. The current economic downturn and health care environment have driven insurance providers to tighten restrictions and decrease reimbursements.

This study was designed to analyze the trends in admission status for reduction mammoplasty patients at our institution during the last 10 years with particular attention to LOS, complication rates, and readmissions. We also evaluated the institutional fiscal implications with regard to reimbursement in the changing health care environment.

METHODS

Institutional review board approval was obtained for this retrospective chart review. Using Lastword database, analysis of all reduction mammoplasties at our institution during the last 10 years (fiscal year 2000–2009) was undertaken. Patient admission status was documented, as well as LOS, mortality, morbidity, and readmission. Surgical admission status was defined as *Same Day Surgery (SDS)*, discharged the same day as the procedure; *Outpatient Ambulatory*, undergoes procedure or receives treatment where discharge is expected in less than 24 hours; *Observation*, has concerning symptoms or signs but does not clearly require immediate hospitalization; *Inpatient*, requires more than 24 hours treatment in immediate care hospital setting and/or has had a procedure that will require an extended recovery.

A financial analysis was performed comparing trends in hospital revenue and operating income. Revenue was defined as the amount that the hospital received from all sources (insurance, patient payments, etc) for service provided to the patient. Operating income, on the other hand, was the revenue reduced by all costs incurred to provide services during that patient's stay—both fixed and variable and both direct and indirect.

RESULTS

In this population, 1779 patients were identified (SDS, 499, no patients classified as such during 2006–2007 fiscal year; outpatient ambulatory or observation, 694; and inpatient, 586). Twenty patients were readmitted within 30 days. The all-cause 30-day readmission rate was 11.24 per 1000 patients. Unrelated reasons for readmission included carpal tunnel release, melanoma resection, itchy eye, gastric fistula, and seroma of the abdomen.

Six readmissions had a questionable relationship to the original mammoplasty surgery, including renal calculi (n = 2), cholecystitis (n = 2), and dehydration/nausea/vomiting (n = 2). The disease-specific

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From the *Department of Surgery, Division of Plastic Surgery and †Department of Community Health and Health Studies, Lehigh Valley Health Network, Allentown, PA.

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Reprints: Christine M. Blaine, MD, Department of Surgery, Division of Plastic Surgery, Lehigh Valley Health Network, Cedar Crest & I-78, PO Box 689, Allentown, PA 18105-1556. E-mail: Christine_M.Blaine@lvhn.org.

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TABLE 1. Complications as a Function of Admission Status

Admission Status	No. Patients	Readmissions (Related)	Readmissions (Questionably Related)	Percentage
Inpatient	586	8	4	2.05
Ambulatory overnight/ observation	694	0	0	0
SDS	499	1	2	0.6
Total	1779	9	6	0.84

readmission rate was 5.06 per 1000 patients (n = 9). These complications included hematoma (n = 4), atrial fibrillation (n = 1), seroma (n = 1), infection (n = 2), and shortness of breath/pneumonia (n = 1). Only 1 patient with disease-specific complication (hematoma) requiring readmission had been classified as SDS. No cases of nipple compromise were identified in our study (Table 1).

Revenue per case was highly variable throughout the study period (Fig. 1). In general, operating income has decreased during the last decade, despite a small increase for those patients who were truly inpatient (Fig. 2).

DISCUSSION

Reduction mammoplasty is designed to reduce breast mass with concomitant reduction of painful symptoms. Women report an improvement in physical activities, appearance of their breasts, and improved psyche and social interactions, after undergoing reduction mammoplasty.³ For all these reasons, breast reduction remains one of the most popular procedures performed by plastic surgeons today.⁴

In today’s health care environment, there is significant movement toward the performance of procedures on an outpatient basis for both quality and cost reasons.⁵⁻⁷ It has been suggested that a hospital stay carries a 5.5% risk of an adverse drug reaction, 17.6% risk of infection, and 3.1% risk of ulcer for an average episode, and each additional night in hospital increases the risk by 0.5% for adverse drug reactions, 1.6% for infections, and 0.5% for ulcers.⁸ An estimated 60% of elective surgery procedures in the United States are currently performed as outpatient surgeries with expectations that will increase to nearly 75% during the next decade. There have been a 68.4% growth number of outpatient procedures in Pennsylvania alone between fiscal years 2000 and 2009.

There are many reasons for this shift to the outpatient arena. In addition to avoiding the pitfalls of a hospital admission detailed previously, ambulatory surgery and outpatient surgery provide advantages

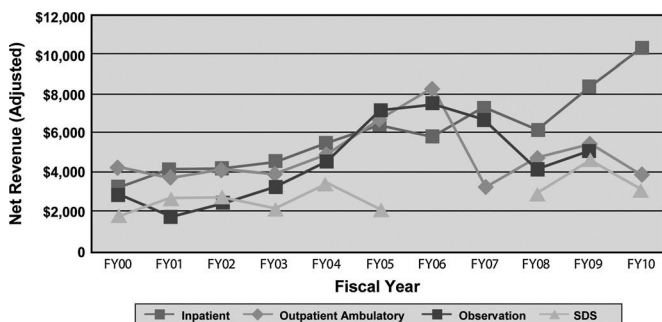


FIGURE 1. Net revenue.

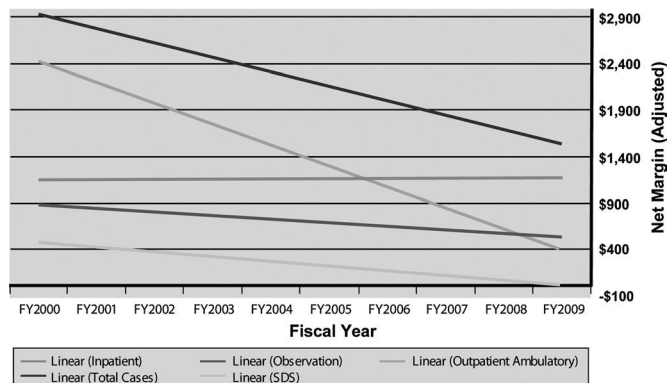


FIGURE 2. Operating outcome.

such as greater control over scheduling, greater privacy and convenience for the patient, increased efficiency and consistency in nursing staff and support personnel, and possibly decreased cost to the patient. However, despite the many benefits of ambulatory surgery, there remain inherent risks associated with any surgical care environment that have the potential to jeopardize patient safety.⁹ Keyes et al¹⁰ reported 23 deaths in 1,141,418 outpatient procedures between 2001 and 2006. Only 1 death was the result of an intraoperative adverse event. Of the 13 pulmonary embolism deaths, 12 were associated with abdominoplasty alone or in association with 1 or more other surgical procedures.¹⁰

This general trend toward outpatient surgery has been paralleled in the reduction mammoplasty population. During calendar years 2009 and 2010, the Tracking Outcomes in Plastic Surgery database identified 5571 reduction mammoplasty cases. Of these cases, 85% were performed on an outpatient basis. In this particular population, when an adverse event was reported, 75% were performed as outpatients and 25% were performed as inpatients. The most recent 2011 Tracking Outcomes in Plastic Surgery data show a similar trend with 90% reduction mammoplasty being performed as outpatients and 87% of complications occurring in this population.¹¹ In a recent review of 411,670 procedures performed during a 2-year period in American Association for Accreditation of Ambulatory Surgery Facilities, Keyes et al¹² reported a significant complication rate of approximately 1 (0.47%) in 214 cases.

Known complications of breast reduction were reported in a recent MOC-PS CME article authored by Nahai and Nahai.¹³ The authors noted a complication rate ranging from 6% to 43%. Early postoperative complications included delayed wound healing, poor nipple vascularity, hematoma, skin flap necrosis, deep venous thrombosis, pulmonary embolism, and infection. Late complications included seroma, scars, shape, nipple positions, asymmetry, fat necrosis, and changes in nipple sensation.

Several studies have specifically evaluated trends in reduction mammoplasty with regard to LOS, outcomes, and efficient use of resources.^{2,14} Our study lends further credibility to these studies in that reduction mammoplasty can be safely performed as an ambulatory procedure with a favorable complication rate of 0.6%. For example, patients have traditionally been observed overnight for evidence of nipple areolar compromise; however, there were no cases of nipple necrosis observed in any patient in this population. In fact, only 1 of 9 disease-related complications was experienced by a patient who had her surgery performed as SDS, attesting to the delivery of high quality, efficient care in the outpatient arena.

Efficiency, however, did not necessarily translate into improved institutional revenue. In fact, we found this not to be the case. Although net revenue remained highly variable for both inpatient and outpatient surgery throughout the study period, the net revenue obtained from the

inpatient population did seem to increase over time. Although the reasons for this are unclear, admission of patients with significant comorbidities or those with a favorable third-party payer base are 2 possible explanations for this phenomenon. It is very likely that additional expenditure control will take the form of significantly limiting the ability to admit a reduction mammoplasty patient as the safety and efficacy of performing this as an outpatient becomes established. What is clear, however, is that the overall operating income (the revenue reduced by all costs incurred to provide services during that patient's stay—both fixed and variable and both direct and indirect) has been decreasing during the same period. One could hypothesize that this is attributable to the relatively flat reimbursement rates during a time when cost profiles have increased.

On March 23, 2010, the Affordable Care Act became a law. This legislation was designed to help reduce the federal deficit by controlling health care expenditures. Although the exact impact of this legislation on the public and private sector insurance markets has yet to be fully elucidated, it is reasonable to assume that significant reduction in expenditures, reflected as reimbursement to individual and institutional providers will occur. As such, the trend demonstrated in our study is disconcerting as an ongoing reduction in operating income is not sustainable. Significant improvements in efficiency and cost control are, therefore, essential.

CONCLUSIONS

An increasing trend in outpatient reduction mammoplasty has been observed over time. Despite this trend, there is no statistically significant difference in readmission rates for complications between inpatient and outpatient reduction mammoplasty populations. Although institutional net revenue is highly variable for this procedure, operating income is decreasing over time. This phenomenon could pose a challenge to the provision of health care in the future unless efficiency and cost-control strategies are implemented.

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