Surgical skill in bariatric surgery: Does skill in one procedure predict outcomes for another?

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Background. *Recent data establish a strong link between peer video ratings of surgical skill and clinical outcomes with laparoscopic gastric bypass. Whether skill for one bariatric procedure can predict outcomes for another related procedure is unknown.*

Methods. *Twenty surgeons voluntarily submitted videos of a standard laparoscopic gastric bypass procedure, which was blindly rated by 10 or more peers using a modified version of the Objective Structured Assessment of Technical Skills. Surgeons were divided into quartiles for skill in performing gastric bypass, and within 30 days of sleeve gastrectomy, their outcomes were compared. Multivariate logistic regression analysis was utilized to adjust for patient risk factors.*

Results. *Surgeons with skill ratings in the top (n = 5), middle (n = 10, middle 2 combined), and bottom (n = 5) quartiles for laparoscopic gastric bypass saw similar rates of surgical and medical complications after laparoscopic sleeve gastrectomy (top 5.7%, middle 6.4%, bottom 5.5%, P = .13). Furthermore, surgeons' skill ratings did not correlate with rates of reoperation, readmission, and emergency department visits. Top-rated surgeons had significantly faster operating room times for sleeve gastrectomy (top 76 minutes, middle 90 minutes, bottom 88 minutes; P < .001) and a higher annual volume of bariatric cases per year (top 240, middle 147, bottom 105; P = .001).*

Conclusion. *Video ratings of surgical skill with laparoscopic gastric bypass do not predict outcomes of laparoscopic sleeve gastrectomy. Evaluation of surgical skill with one procedure may not apply to other related procedures and may require independent assessment of surgical technical proficiency. (Surgery 2016;■:■-■.)*

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IT IS WELL ESTABLISHED THAT OPERATIVE OUTCOMES vary widely across hospitals and surgeons. Numerous studies throughout the past 2 decades have

demonstrated a relationship between outcomes and certain proxies for surgeon proficiency, including high surgeon and hospital volume as well as subspecialty fellowship training.[1-5] Recently, evidence has emerged demonstrating that peer ratings of surgical skill, observed on operative videos, correlate highly with better outcomes for laparoscopic gastric bypass surgery.[6] This body of work has generated significant enthusiasm for using videos to study and improve the intraoperative details of surgical care via coaching or other methods.[7-10]

Given the growing interest for studying surgeon skill as a measure of quality, it is important to understand whether these ratings can be extrapolated beyond the measured operation to other procedures within that surgeon's practice. On one hand, many laparoscopic skills, such as exposure,

dissection, and tissue handling, are relevant to a wide variety of procedures. On the other hand, surgical procedures may have certain technical steps that require procedure-specific skills. Each operation may require skills that may not be immediately translatable to other procedures. For example, when performing laparoscopic gastric bypass, one would have to be adept at performing gastrointestinal anastomoses (involving advanced laparoscopic stapling and suturing), a skill set which may not be essential for another common bariatric procedure such as laparoscopic sleeve gastrectomy.

In this context, we sought to assess the extent to which surgical skill ratings with one laparoscopic procedure (gastric bypass) correlate with outcomes for another bariatric procedure (sleeve gastrectomy) performed by the same surgeons. Using data from the Michigan Bariatric Surgical Collaborative (MBSC), we compared video peer ratings of surgical skill using a modified Objective Structures Assessment of Technical Skills (OSATS) of surgeons performing a laparoscopic gastric bypass with risk-adjusted outcomes for laparoscopic sleeve gastrectomy among the same cohort of surgeons.

METHODS

Data source and study population. This study was conducted based on the analysis of data from the MBSC. The MBSC is a payer-funded consortium of 40 hospitals and 75 surgeons that submit data on all patients undergoing primary and revision bariatric surgery. Since 2006, data on more than 54,000 patients have been obtained and cover a wide range of variables, including information on demographic variables, preoperative co-morbidities, perioperative process of care, 30-day complication rates, and weight loss outcomes. Data obtained on patient variables are collected by centrally trained abstractors based on standardized definitions and are audited annually by external reviewers from the coordinating center to ensure accuracy and completeness of data.

This study included data on patients who underwent laparoscopic sleeve gastrectomy between August 2006 and March 2015 by 20 surgeons who participated in this study ($n = 7,663$). To assess patient bias, the study cohort was compared with the remaining patients in the MBSC who underwent sleeve gastrectomy ($n = 9,577$). We found that both groups were similar with respect to mean BMI, age, rate of male patients, 30-day complications, reoperations, readmissions, and emergency room visits (Appendix).

Participating surgeons and raters. The objective of this study was to use surgeons' peer-reviewed skill ratings regarding laparoscopic gastric bypass videos, which had been performed in a previous study by Birkmeyer et al,[6] to assess the outcomes of their performances of laparoscopic sleeve gastrectomy. Details of the video submission and rater review process are described in our previous study.[6] For the present study, no new reviewers were recruited to rate the laparoscopic gastric bypass videos. To summarize, the video assessment methodology, 20 surgeons participated in the study and submitted videos of a standard laparoscopic gastric bypass, which was edited to consist of 3 key technical components of the operation: (1) creation of the gastric pouch, (2) the gastrojejunostomy, and (3) the jejunojejunostomy. Videos were free of patient identifiers and were edited to eliminate images that may reveal the identity of the patient (ie, camera exchanges to clean the lens or to move from one port to another). Each video was rated by 10 or more peers who were blinded to the identity of the operating surgeon. Overall, 33 surgeons from 24 hospitals served as raters from July 2011 to June 2012. Surgeons rated each video using a modified version of OSATS that had been validated previously.[11,12] The assessment tool includes an evaluation of a surgeon's tissue handling, time and motion, instrument handling, flow of operation, tissue exposure, and overall technical skill. Surgeons were rated using a 1-to-5 anchored Likert-type scale. A skill rating of 1 indicated the level of a general surgery chief resident; 3 that of an average bariatric surgeon; and 5 that of a "master" surgeon. There was no attempt to teach raters or provide rating norms. Because each video was rated by a different groups of raters, a z score was calculated, and it was determined that no rater's score was significantly different from the mean. A sensitivity analysis was performed in the prior study, and the analysis involved rating video of a second operation from each surgeon in the best and worst quartiles of skill. This demonstrated that the mean ratings for the first and second videos were highly correlated. Finally, 5 non-Michigan surgeons rated the gastric bypass videos of surgeons in the highest and lowest skill quartiles. Mean ratings from Michigan and non-Michigan surgeons also correlated highly, and there was no overlap among mean ratings of surgeons in the highest and lowest quartiles.[6]

Outcomes. The primary goal of this study was to determine whether peer ratings of surgical skill from a video of laparoscopic gastric bypass were associated with risk-adjusted outcomes for patients