ROBOTIC ASSISTED VERSUS LAPAROSCOPIC BARIATRIC PROCEDURES: COMPARATIVE AND COST ANALYSIS USING THE MBSAQIP DATABASE

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Background

- Robotic-assisted (RA) bariatric procedures are becoming more prevalent in practice settings.
- Robotic cost implications are unclear.
- Uncertain if RA procedures provide clinical and/or economical benefits compared to conventional laparoscopy.

Objective

- Compare the clinical outcomes and costs of RA bariatric surgery versus conventional laparoscopy, specifically primary Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG).

Methods

- The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was used to determine 30-day postoperative outcomes for January 2015 to December 2018 records.
- Separate SG and RYGB 1:1 propensity score matched cohorts were determined using 23 independent patient characteristics: robotic-SG (R-SG) vs. laparoscopic-SG (L-SG), robotic-RYGB (R-RYGB) vs. laparoscopic-RYGB (L-RYGB).
- Univariate and multivariable regression analyses were performed to evaluate clinical outcomes.
- A literature search of the MEDLINE database was performed from January 2010 to August 2020 to obtain cost estimates of bariatric procedures.
- Direct costs were estimated from published data of two US bariatric centers and the Vizient administrative database; these costs were extrapolated to the propensity matched MBSAQIP cohorts.

Results

- A total of 33,488 patients were matched to the SG cohort while 12,092 patients were matched to the RYGB cohort.
- R-SG had lower rates of mortality (mean difference(MD) -0.048%), longer operation time (OT) (MD +27.74), increased length of stay (LOS) (MD +0.055) and more serious complications (MD +0.31%) than L-SG.
- R-RYGB had fewer bleeds (MD -0.46%), longer OT (MD +39.05), and increased reoperation (MD +0.53%), readmission (MD +0.91%), and reintervention (MD +0.42%,) rates.
- Direct costs for R-SG and R-RYGB were estimated to be on average $236.31 to $3411.34 and $120.22 to $3479.97 more per case, respectively.
- Costs were most sensitive to OT followed by LOS; a reduction in R-RYGB MD operation time of approximately 20% would lead to economic feasibility at select institutions.

Conclusions

- Neither clinical nor economic arguments support adoption of robotic approaches in bariatrics at this time.
- Longer OT for RA procedures may be linked to unfamiliarity with robotic systems.
- Confidential agreements between institutions and manufacturers may make RA surgeries economically feasible.
- Additional research is needed to justify the ongoing use of the robotics in bariatrics.