National Trends In Revisional Bariatric Surgery: Eight-year Analysis Of the MBSAQIP Registry (2015-2022)

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Introduction

- Revisional metabolic and bariatric surgery (MBS) accounts for ~13.5% of annual bariatric surgery cases in the U.S.
- MBSAQIP database was analyzed to assess trends in revisional MBS patient characteristics, procedures, and outcomes.
- This study evaluates perioperative trends over an 8-year period.

Methods

- All MBSAQIP Cases: (2015-2022). 1,577,175 total MBS records.
- After excluding pediatric cases, missing age, open cases, non-binary/missing gender, missing or BMI <30 kg/m², and missing operative time, 178,831 revision and conversion cases identified
- Trends in patient demographics, perioperative factors, and 30-day outcomes. using Kruskal-Wallis and Cochran-Armitage tests for statistical analysis.

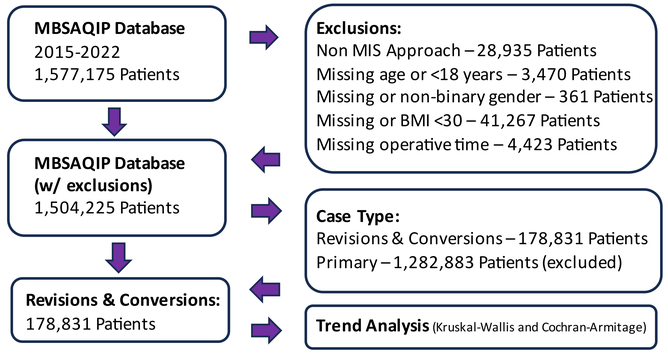


Figure 1 - Methodological flowchart, outlining the data cleaning and statistical analysis process employed in the study.

Conclusions

- Revisional MBS patients have increased perioperative risk profiles, with higher comorbidity prevalence over time.
- Despite increased patient complexity, rates of many major complications, unplanned ICU admissions, and SSI have significantly decreased.
- Decreasing conversion rates to open surgery highlight improving safety in revisional MBS.

Institutions

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Results

Trends in Revisions and Conversion Over Time in the MBSAQIP

Year	2015	2016	2017	2018	2019	2020	2021	2022	
Case number (n)	18466	21363	23999	25192	26501	17575	22387	23348	
Age, median (IQR)	48 (40-56)	48.38 (40.64-57.04)	48.54 (41.03-57.22)	49.03 (41.35-57.72)	49.36 (41.54-57.73)	48 (41-56)	48 (40-55)	48 (41-55)	<0.0001
Sex									
Female	15766 (85.38%)	18224 (85.31%)	20421 (85.09%)	21378 (84.86%)	22557 (85.12%)	15225 (86.63%)	19634 (87.7%)	20636 (88.38%)	<0.0001
Male	2700 (14.62%)	3139 (14.69%)	3578 (14.91%)	3814 (15.14%)	3944 (14.88%)	2350 (13.37%)	2753 (12.3%)	2712 (11.62%)	<0.0001
Race									
White	12471 (67.53%)	14184 (66.4%)	15906 (66.28%)	16321 (64.79%)	17038 (64.29%)	10288 (58.54%)	12491 (55.8%)	12563 (53.81%)	<0.0001
Black	3158 (17.1%)	3762 (17.61%)	4297 (17.9%)	4785 (18.99%)	5044 (19.03%)	3999 (22.75%)	5231 (23.37%)	5777 (24.74%)	<0.0001
Hispanic	1634 (8.85%)	1894 (8.87%)	2230 (9.29%)	2466 (9.79%)	2665 (10.06%)	2018 (11.48%)	2964 (13.24%)	3388 (14.51%)	<0.0001
Other/Mixed	1203 (6.51%)	1523 (7.13%)	1566 (6.53%)	1620 (6.43%)	1754 (6.62%)	1270 (7.23%)	1701 (7.6%)	1620 (6.94%)	<0.0001
BMI, median (IQR)	40.55 (36.28-45.83)	40.62 (36.38-45.83)	40.74 (36.39-46.01)	40.57 (36.32-45.86)	40.43 (36.18-45.61)	41.07 (36.9-46.43)	41.12 (36.94-46.29)	41.14 (36.94-46.49)	<0.0001
Diabetes Status									
No	15355 (83.15%)	17690 (82.81%)	19868 (82.79%)	20854 (82.78%)	21897 (82.63%)	14873 (84.63%)	19134 (85.47%)	19721 (84.47%)	<0.0001
Non-Insulin	2173 (11.77%)	2498 (11.69%)	2901 (12.09%)	3040 (12.07%)	3277 (12.37%)	1975 (11.24%)	2426 (10.84%)	2747 (11.77%)	<0.0001
Insulin	938 (5.08%)	1175 (5.5%)	1230 (5.13%)	1298 (5.15%)	1327 (5.01%)	727 (4.14%)	827 (3.69%)	880 (3.77%)	<0.0001
OSA	4339 (23.5%)	5210 (24.39%)	6095 (25.4%)	6524 (25.9%)	6993 (26.39%)	4852 (27.61%)	5997 (26.79%)	6577 (28.17%)	<0.0001
GERD	6962 (37.7%)	8248 (38.61%)	9295 (38.73%)	10279 (40.8%)	11663 (44.01%)	8668 (49.32%)	12141 (54.23%)	13249 (56.75%)	<0.0001
History MI	210 (1.14%)	289 (1.35%)	316 (1.32%)	346 (1.37%)	411 (1.55%)	180 (1.02%)	228 (1.02%)	234 (1%)	<0.0001
History DVT	312 (1.69%)	445 (2.08%)	516 (2.15%)	626 (2.48%)	657 (2.48%)	394 (2.24%)	506 (2.26%)	570 (2.44%)	<0.0001
History PE	248 (1.34%)	322 (1.51%)	383 (1.6%)	437 (1.73%)	509 (1.92%)	329 (1.87%)	425 (1.9%)	490 (2.1%)	<0.0001
Immunosuppression	325 (1.76%)	410 (1.92%)	484 (2.02%)	543 (2.16%)	653 (2.46%)	451 (2.57%)	606 (2.71%)	677 (2.9%)	<0.0001
Anticoagulation	441 (2.39%)	633 (2.96%)	820 (3.42%)	945 (3.75%)	1040 (3.92%)	589 (3.35%)	714 (3.19%)	829 (3.55%)	<0.0001
ASA									
1 & 2	5888 (31.89%)	6247 (29.24%)	6786 (28.28%)	6966 (27.65%)	7095 (26.77%)	3919 (22.3%)	4909 (21.93%)	5044 (21.6%)	<0.0001
3	12042 (65.21%)	14457 (67.67%)	16502 (68.76%)	17478 (69.38%)	18620 (70.26%)	13065 (74.34%)	16832 (75.19%)	17677 (75.71%)	<0.0001
4 & 5	490 (2.65%)	528 (2.47%)	623 (2.6%)	671 (2.66%)	711 (2.68%)	544 (3.1%)	622 (2.78%)	605 (2.59%)	0.01480
Unknown	46 (0.25%)	131 (0.61%)	88 (0.37%)	77 (0.31%)	75 (0.28%)	47 (0.27%)	24 (0.11%)	22 (0.09%)	<0.0001
Conversion to Open	280 (1.52%)	276 (1.29%)	304 (1.27%)	341 (1.35%)	295 (1.11%)	180 (1.02%)	176 (0.79%)	128 (0.55%)	<0.0001
Op Time, median (IQR)	94 (58-142)	93 (57-140)	91 (56-140)	94 (57-144)	99 (60-151)	121 (83-172)	122 (84-170)	123 (86-169)	<0.0001
Readmission	1055 (5.71%)	1142 (5.35%)	1260 (5.25%)	1340 (5.32%)	1525 (5.75%)	950 (5.41%)	1283 (5.73%)	1318 (5.65%)	0.0566
Reoperation	513 (2.78%)	556 (2.6%)	612 (2.55%)	634 (2.52%)	730 (2.75%)	467 (2.66%)	579 (2.59%)	570 (2.44%)	0.3104
Intervention	502 (2.72%)	515 (2.41%)	524 (2.18%)	585 (2.32%)	638 (2.41%)	319 (1.82%)	429 (1.92%)	404 (1.73%)	<0.0001
Unplanned ICU	230 (1.25%)	245 (1.15%)	275 (1.15%)	271 (1.08%)	289 (1.09%)	172 (0.98%)	190 (0.85%)	220 (0.94%)	0.0015
Unplanned Intubation	45 (0.24%)	67 (0.31%)	47 (0.2%)	40 (0.16%)	58 (0.22%)	40 (0.23%)	44 (0.2%)	41 (0.18%)	0.0187
Death	29 (0.16%)	37 (0.17%)	32 (0.13%)	38 (0.15%)	44 (0.17%)	19 (0.11%)	32 (0.14%)	34 (0.15%)	<0.0001
Infection	612 (3.31%)	728 (3.41%)	757 (3.15%)	826 (3.28%)	930 (3.51%)	479 (2.73%)	638 (2.85%)	638 (2.73%)	<0.0001
Superficial SSI	233 (1.26%)	241 (1.13%)	284 (1.18%)	279 (1.11%)	306 (1.15%)	139 (0.79%)	177 (0.79%)	185 (0.79%)	<0.0001
Organ Space SSI	169 (0.92%)	201 (0.94%)	203 (0.85%)	281 (1.12%)	322 (1.22%)	178 (1.01%)	238 (1.06%)	245 (1.05%)	0.0016
VTE	39 (0.21%)	38 (0.18%)	40 (0.17%)	43 (0.17%)	53 (0.2%)	0 (0%)	45 (0.2%)	57 (0.24%)	<0.0001
Sepsis	72 (0.39%)	95 (0.44%)	100 (0.42%)	112 (0.44%)	135 (0.51%)	65 (0.37%)	75 (0.34%)	75 (0.32%)	0.0222
Deep SSI	71 (0.38%)	77 (0.36%)	67 (0.28%)	71 (0.28%)	77 (0.29%)	34 (0.19%)	52 (0.23%)	30 (0.13%)	<0.0001

Table 1 – Trends in Preoperative, Intraoperative, and 30-day Outcomes in Revisions and Conversions in the MBSAQIP 2015-2022