

RE-DO SURGERY DOPO SLEEVE GASTRECTOMY

A. Usai

Chirurgia Generale e Urgenza
Direttore P. Millo
Ospedale U. Parini
Aosta



S.I.C.O.B.

XXVIII
CONGRESSO NAZIONALE

SICOB ONLINE


21-22 DICEMBRE 2020

Presidenti: P. Gentileschi, A. Giovanelli,
M.G. Carbonelli, F. Micanti





Bariatric Surgery and Endoluminal Procedures: IFSO Worldwide Survey 2014

L. Angrisani¹ · A. Santonicola²  · P. Iovino² · A. Vitiello¹ · N. Zundel³ · H. Buchwald⁴ · N. Scopinaro⁵

According to the latest International Federation for the Study of Obesity and Metabolic Disorders (IFSO) survey, among 579,517 bariatric procedures performed worldwide in 2014, LSG was the most commonly performed procedure that reached 45.9%



Systematic review on reoperative bariatric surgery

American Society for Metabolic and Bariatric Surgery Revision Task Force

Stacy A. Brethauer, M.D.^{a,*}, Shanu Kothari, M.D.^b, Ranjan Sudan, M.D.^c,



Surgery for Obesity and Related Diseases ■ (2014) 00–00

Literature:

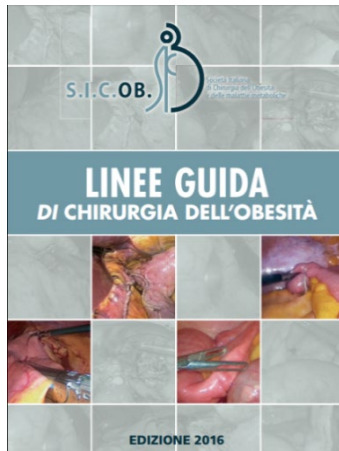
Redo Surgery 5-56%

- REVISIONAL: do not modify the basic anatomy of the primary surgery (re-sleeve, re-banding)
- CONVERSION: a change in the structural anatomy of the primary operation in to a different type of surgery (restrictive to malabsorptive)
- REVERSAL: restoration of the original anatomy



INDICATIONS AFTER SLEEVE:

- INADEQUATE WEIGHT LOSS
- WEIGHT REGAIN
- SEVERE GERD
- SURGICAL COMPLICATIONS



Box 1

Indications for revision following laparoscopic sleeve gastrectomy

Issues

Insufficient weight loss

Weight recidivism

Technical reasons

Anastomotic leaks

Sleeve stricture

Sleeve dilation

Miscellaneous

GERD

Data from Brethauer SA, Kothari S, Sudan R, et al. Systematic review on reoperative bariatric surgery: American Society for Metabolic and Bariatric Surgery Revision Task Force. Surg Obes Relat Dis 2014;10(5):952–72.





Revisional Bariatric Surgery Following Failed Primary Laparoscopic Sleeve Gastrectomy: A Systematic Review

Douglas Cheung · Noah J. Switzer · Richdeep S. Gill ·
Xinzhe Shi · Shahzeer Karmali



2017

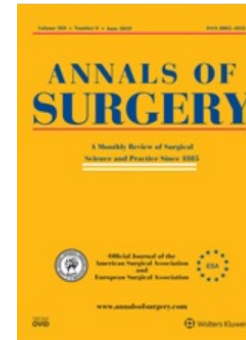
- Failure usually multifactorial
- Poor adherence lifestyle modification
- Operator error



Weight Loss, Appetite Suppression, and Changes in Fasting and Postprandial Ghrelin and Peptide-YY Levels After Roux-en-Y Gastric Bypass and Sleeve Gastrectomy

A Prospective, Double Blind Study

*Stavros N. Karamanakos, MD, Konstantinos Vagenas, MD, Fotis Kalfarentzos, MD, FACS,
and Theodore K. Alexandrides, MD*



2008

IWL →

- Residual fundus (neofundus) > Ghrelin levels

Ghrelin levels, which are temporarily decreased after surgery because of fundal resection, return to baseline level within 6–12 months and lead to increased appetite and greater





Revisional Bariatric Surgery Following Failed Primary Laparoscopic Sleeve Gastrectomy: A Systematic Review

Douglas Cheung · Noah J. Switzer · Richdeep S. Gill ·
Xinzhe Shi · Shahzeer Karmali



2017

WR →

- Antral dilatation or antrum with high volume



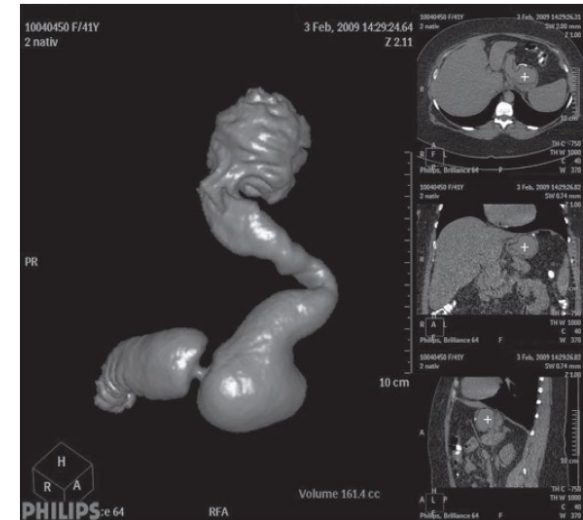
Failure of Laparoscopic Sleeve Gastrectomy Further Procedure?

Rudolf A. Weiner Sophia Theodoridou Sylvia Weiner

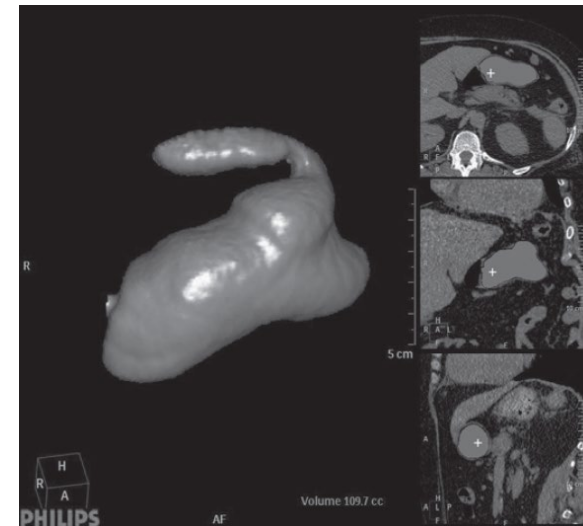
From October 2001 to December 2010,
937 patients

50% of primary treatment failure (poor
weight loss from the beginning) were
caused by incomplete resection

IWL →



WR →





REVIEW ARTICLE



Mid-long-term Revisional Surgery After Sleeve Gastrectomy: a Systematic Review and Meta-analysis

Bingsheng Guan¹ · Tsz Hong Chong¹ · Juzheng Peng¹ · Yanya Chen² · Cunchuan Wang¹ · Jinqqe Yanq¹

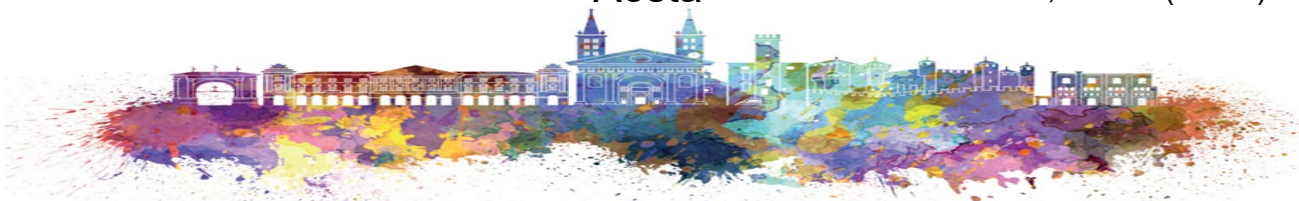
2019

32 studies included
 (3RCTs, 29
 observational)
 6665 pts

Revision rate Range
 (2.5%-33%)

Authors	Year	Location	Preoperative BMI (kg/m ²)	Preoperative Age (years)	n	N	Follow-up (years)
Ruiz-Tovar	2019	Spain	46.5 ± 3.4	43.9 ± 10.9	6	182	5
Altieri	2018	USA	NA	NA	174	1781	4
Peterli	2018	Switzerland	43.6 ± 5.2	43.0 ± 11.1	15	101	5
Chang	2018	Taiwan	NA	NA	14	65	10
Castagneto	2018	Italy	46.6 ± 7.3	43.4 ± 11.0	7	121	10+
Kowalewski	2018	Poland	35.9–72.0	17–64	16	100	8.0
Felsenreich	2018	Austria	49.0 ± 9.1	NA	32	97	10+
Flelo	2017	Norway	46 ± 6.3	40.3 ± 10.5	7	168	5
Noel	2017	France	31.1–77.9	NA	23	139	8
Mandeville	2017	Belgium	30.3–67.5	15–69	26	88	8,48
Schauer	2017	USA	36.2 ± 3.9	47.9 ± 8.0	2	50	5
Gadiot	2017	Netherlands	44.8 ± 6.7	42 ± 10.7	44	277	5–8
Lessing	2017	Israel	43.3 ± 6.3	30–64	2	51	5
Yilmaz	2017	Turkey	NA	34.1 ± 13.1	32	500	3,01
Garofalo	2016	Canada	45.1 ± 5.6	65–74	5	30	3
Arman	2016	Belgium	38.8 ± 7.5	38.7 ± 9.7	20	63	11,7
Seki	2016	Japan	43.3 ± 10	40.7 ± 11.2	6	179	5
Angrisani	2016	Italy	NA	NA	9	99	5
Dakour	2016	Lebanon	42.8 ± 7.1	36.5 ± 13.3	4	76	7
Casella	2016	Italy	45.9 ± 7.3	NA	4	152	6,25
Dogan	2015	Netherlands	45.8 ± 6.0	39.7 ± 10.0	23	245	3,1
Lee	2015	Taiwan	37.5 ± 6.1	36.0 ± 9.1	16	154	5
Abd	2014	Egypt	46 ± 9	33 ± 7	56	1395	6,34
Prevot	2014	France	47.7 ± 7	40 ± 11	11	95	5
Boza	2014	Chile	34,9	16–65	4	161	4,5
Sieber	2014	Switzerland	46 ± 7,1	43 ± 11,4	8	68	5,9
Rawlins	2013	USA	39–106	NA	4	55	5
Catheline	2013	France	49.9 ± 9.1	41.8 ± 11.3	8	53	5
Abbatini	2013	Greece	52.1 ± 8.5	49.3 ± 8	7	33	3
Sarela	2012	United Kingdom	35.8–63.7	23–65	4	20	8–9
Bohdjalian	2010	Austria	48.2 ± 1.3	46.2 ± 2.5	4	26	5
Himpens	2010	Belgium	39.5 ± 5.5	28–71	13	41	6+

Aosta 43,2 45 (34-57) 12 204 10+





REVIEW ARTICLE



Mid-long-term Revisional Surgery After Sleeve Gastrectomy: a Systematic Review and Meta-analysis

Bingsheng Guan¹ · Tsz Hong Chong¹ · Juzheng Peng¹ · Yanya Chen² · Cunchuan Wang¹ · Jinqqe Yanq¹

2019

32 studies included
 (3RCTs, 29
 observational)
 6665 pts

Overall Revision Rate
 10.4% with **3-years** FU

Revision rate Range
 (2.5%-33%)

Authors	Year	Location	Preoperative BMI (kg/m ²)	Preoperative Age (years)	n	N	Follow-up (years)
Ruiz-Tovar	2019	Spain	46.5 ± 3.4	43.9 ± 10.9	6	182	5
Altieri	2018	USA	NA	NA	174	1781	4
Peterli	2018	Switzerland	43.6 ± 5.2	43.0 ± 11.1	15	101	5
Chang	2018	Taiwan	NA	NA	14	65	10
Castagneto	2018	Italy	46.6 ± 7.3	43.4 ± 11.0	7	121	10+
Kowalewski	2018	Poland	35.9–72.0	17–64	16	100	8.0
Felsenreich	2018	Austria	49.0 ± 9.1	NA	32	97	10+
Flelo	2017	Norway	46 ± 6.3	40.3 ± 10.5	7	168	5
Noel	2017	France	31.1–77.9	NA	23	139	8
Mandeville	2017	Belgium	30.3–67.5	15–69	26	88	8,48
Schauer	2017	USA	36.2 ± 3.9	47.9 ± 8.0	2	50	5
Gadiot	2017	Netherlands	44.8 ± 6.7	42 ± 10.7	44	277	5–8
Lessing	2017	Israel	43.3 ± 6.3	30–64	2	51	5
Yilmaz	2017	Turkey	NA	34.1 ± 13.1	32	500	3,01
Garofalo	2016	Canada	45.1 ± 5.6	65–74	5	30	3
Arman	2016	Belgium	38.8 ± 7.5	38.7 ± 9.7	20	63	11,7
Seki	2016	Japan	43.3 ± 10	40.7 ± 11.2	6	179	5
Angrisani	2016	Italy	NA	NA	9	99	5
Dakour	2016	Lebanon	42.8 ± 7.1	36.5 ± 13.3	4	76	7
Casella	2016	Italy	45.9 ± 7.3	NA	4	152	6,25
Dogan	2015	Netherlands	45.8 ± 6.0	39.7 ± 10.0	23	245	3,1
Lee	2015	Taiwan	37.5 ± 6.1	36.0 ± 9.1	16	154	5
Abd	2014	Egypt	46 ± 9	33 ± 7	56	1395	6,34
Prevot	2014	France	47.7 ± 7	40 ± 11	11	95	5
Boza	2014	Chile	34,9	16–65	4	161	4,5
Sieber	2014	Switzerland	46 ± 7,1	43 ± 11,4	8	68	5,9
Rawlins	2013	USA	39–106	NA	4	55	5
Catheline	2013	France	49.9 ± 9.1	41.8 ± 11.3	8	53	5
Abbatini	2013	Greece	52.1 ± 8.5	49.3 ± 8	7	33	3
Sarela	2012	United Kingdom	35.8–63.7	23–65	4	20	8–9
Bohdjalian	2010	Austria	48.2 ± 1.3	46.2 ± 2.5	4	26	5
Himpens	2010	Belgium	39.5 ± 5.5	28–71	13	41	6+

aosta 43,2 45 (34-57) 12 204 10+





REVIEW ARTICLE



Mid-long-term Revisional Surgery After Sleeve Gastrectomy: a Systematic Review and Meta-analysis

Bingsheng Guan¹ · Tsz Hong Chong¹ · Juzheng Peng¹ · Yanya Chen² · Cunchuan Wang¹ · Jinqqe Yanq¹

2019

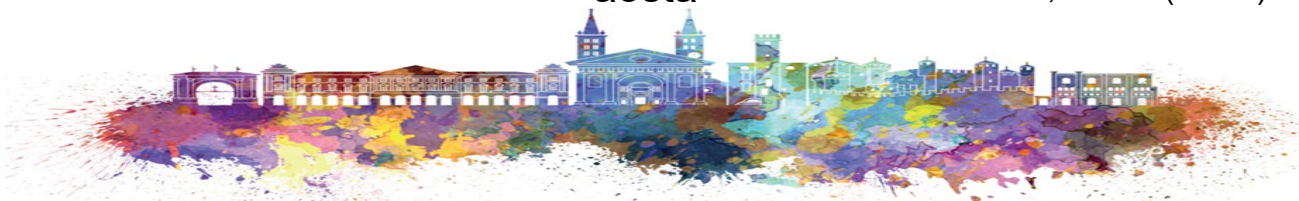
32 studies included
 (3RCTs, 29
 observational)
 6665 pts

Overall Revision Rate
 22.6% with **10-years** FU

Revision rate Range
 (2.5%-33%)

Authors	Year	Location	Preoperative BMI (kg/m ²)	Preoperative Age (years)	n	N	Follow-up (years)
Ruiz-Tovar	2019	Spain	46.5 ± 3.4	43.9 ± 10.9	6	182	5
Altieri	2018	USA	NA	NA	174	1781	4
Peterli	2018	Switzerland	43.6 ± 5.2	43.0 ± 11.1	15	101	5
Chang	2018	Taiwan	NA	NA	14	65	10
Castagneto	2018	Italy	46.6 ± 7.3	43.4 ± 11.0	7	121	10+
Kowalewski	2018	Poland	35.9–72.0	17–64	16	100	8.0
Felsenreich	2018	Austria	49.0 ± 9.1	NA	32	97	10+
Flelo	2017	Norway	46 ± 6.3	40.3 ± 10.5	7	168	5
Noel	2017	France	31.1–77.9	NA	23	139	8
Mandeville	2017	Belgium	30.3–67.5	15–69	26	88	8,48
Schauer	2017	USA	36.2 ± 3.9	47.9 ± 8.0	2	50	5
Gadiot	2017	Netherlands	44.8 ± 6.7	42 ± 10.7	44	277	5–8
Lessing	2017	Israel	43.3 ± 6.3	30–64	2	51	5
Yilmaz	2017	Turkey	NA	34.1 ± 13.1	32	500	3,01
Garofalo	2016	Canada	45.1 ± 5.6	65–74	5	30	3
Arman	2016	Belgium	38.8 ± 7.5	38.7 ± 9.7	20	63	11,7
Seki	2016	Japan	43.3 ± 10	40.7 ± 11.2	6	179	5
Angrisani	2016	Italy	NA	NA	9	99	5
Dakour	2016	Lebanon	42.8 ± 7.1	36.5 ± 13.3	4	76	7
Casella	2016	Italy	45.9 ± 7.3	NA	4	152	6,25
Dogan	2015	Netherlands	45.8 ± 6.0	39.7 ± 10.0	23	245	3,1
Lee	2015	Taiwan	37.5 ± 6.1	36.0 ± 9.1	16	154	5
Abd	2014	Egypt	46 ± 9	33 ± 7	56	1395	6,34
Prevot	2014	France	47.7 ± 7	40 ± 11	11	95	5
Boza	2014	Chile	34,9	16–65	4	161	4,5
Sieber	2014	Switzerland	46 ± 7,1	43 ± 11,4	8	68	5,9
Rawlins	2013	USA	39–106	NA	4	55	5
Catheline	2013	France	49.9 ± 9.1	41.8 ± 11.3	8	53	5
Abbatini	2013	Greece	52.1 ± 8.5	49.3 ± 8	7	33	3
Sarela	2012	United Kingdom	35.8–63.7	23–65	4	20	8–9
Bohdjalian	2010	Austria	48.2 ± 1.3	46.2 ± 2.5	4	26	5
Himpens	2010	Belgium	39.5 ± 5.5	28–71	13	41	6+

aosta 43,2 45 (34-57) 12 204 10+





REVIEW ARTICLE



Mid-long-term Revisional Surgery After Sleeve Gastrectomy: a Systematic Review and Meta-analysis

2019

Bingsheng Guan¹ · Tsz Hong Chong¹ · Juzheng Peng¹ · Yanya Chen² · Cunchuan Wang¹ · Jingge Yang¹

Authors	Reasons for revisional surgery (n, %)			Surgical procedures for revisional surgery (n, %)				
	Failure in weight loss	GERD	Others	RYGB	R-SG	BPD-DS	DS	Others
Ruiz-Tovar	3 (1.6%)	3 (1.6%)	—	6 (3.2%)	—	—	—	—
Altieri	—	—	NA (174, 9.8%)	—	—	—	—	NA (174, 9.8%)
Peterli	5 (5.0%)	9 (8.9%)	—	11 (10.9%)	—	3 (3.0%)	—	—
Chang	—	—	GERD or WR (14, 21.5%)	11 (16.9%)	—	—	—	Hiatal repair (3, 4.6%)
Castagneto	4 (3.3%)	2 (1.7%)	NA (1, 0.8%)	2 (1.7%)	—	4 (3.3%)	—	OAGB (1, 0.8%)
Kowalewski	15 (15%)	1 (1%)	—	14 (14%)	—	—	—	OAGB (1, 1%), Band (1, 1%)
Felsenreich	22 (22.7%)	11 (11.3%)	—	31 (32.0%)	—	—	1 (1.0%)	Santoro's procedure (1, 1.0%)
Flato	6 (3.6%)	1 (0.6%)	—	1 (0.6%)	2 (1.2%)	4 (2.4%)	—	—
Noel	14 (10.1%)	9 (6.4%)	—	6 (4.3%)	12 (8.6%)	—	4 (2.9%)	SADI (1, 0.7%)
Mandeville	19 (21.6%)	5 (5.7%)	IWL and GERD (2, 2.3%)	26 (29.6%)	—	—	—	—
Schauer	—	—	Gastric leak (2, 4%)	1 (2%)	—	—	—	Jejunostomy (1, 2%)
Gadiot	38 (13.7%)	6 (2.2%)	—	44 (15.9%)	—	—	—	—
Garofalo	3 (10%)	—	Gastric stricture (2, 6.6%)	4 (13.3%)	—	—	1 (3.3%)	—
Lessing	2 (3.9%)	—	—	2 (3.9%)	—	—	—	—
Yilmaz	26 (5.2%)	6 (1.2%)	—	9 (1.8%)	23 (4.6%)	—	—	—
Arman	16 (25.4%)	4 (6.4%)	—	6 (9.5%)	3 (4.8%)	—	10 (15.9%)	Hiatoplasty (1, 1.6%)
Seiki	5 (2.8%)	1 (0.6%)	—	2 (1.1%)	—	—	3 (1.7%)	Saromyotomy (1, 0.6%)
Angrisani	7 (7.1%)	2 (2.0%)	—	5 (5.1%)	—	—	4 (4.0%)	—
Dakour	3 (3.9%)	—	—	—	2 (2.6%)	—	—	OAGB (1, 1.3%)
Casella	4 (2.6%)	—	—	—	—	4 (2.6%)	—	—
Doğan	21 (8.6%)	—	Dysphagia (2, 0.8%)	23 (9.4%)	—	—	—	—
Lee	6 (3.9%)	8 (5.2%)	Gastric stricture (1, 0.6%), Intestinal diabetes (1, 0.6%)	—	—	—	—	NA (16, 10.3%)
Abd	37 (2.7%)	19 (1.4%)	—	24 (1.8%)	19 (1.4%)	—	—	Band (13, 0.9%)
Prevot	—	—	NA (11, 11.6%)	—	3 (3.2%)	—	8 (8.4%)	DJB (1, 0.6%)
Boza	3 (1.9%)	—	Gastric stricture (1, 0.6%)	3 (1.9%)	—	—	—	—
Sieber	8 (11.7%)	—	—	2 (2.9%)	—	6 (8.8%)	—	—
Rawlins	—	—	NA (4, 7.3%)	—	—	—	4 (7.3%)	—
Catheline	8 (15.1%)	—	—	5 (9.4%)	3 (5.7%)	—	—	—
Abbatini	7 (21.2%)	—	—	—	—	—	—	BPD (7, 21.2%)
Sarda	—	—	NA (4, 20%)	3 (15%)	—	—	1 (5%)	—
Bohdjalian	3 (11.5%)	1 (3.9%)	—	4 (15.4%)	—	—	—	—
Himpens	13 (31.7%)	—	—	—	2 (4.9%)	—	11 (26.8%)	—

aosta 7 (3,4%) 1(0,5%) 4(1,9%)





REVIEW ARTICLE



Mid-long-term Revisional Surgery After Sleeve Gastrectomy: a Systematic Review and Meta-analysis

Bingsheng Guan¹ · Tsz Hong Chong¹ · Juzheng Peng¹ · Yanya Chen² · Cunchuan Wang¹ · Jingge Yang¹

2019

Authors	Reasons for revisional surgery (n, %)			Surgical procedures for revisional surgery (n, %)				
	Failure in weight loss	GERD	Others	RYGB	R-SG	BPD-DS	DS	Others
Ruiz-Tovar	3 (1.6%)	3 (1.6%)	–	6 (3.2%)	–	–	–	–
Altieri	–	–	NA (174, 9.8%)	–	–	–	–	NA (174, 9.8%)
Peterli	5 (5.0%)	9 (8.9%)	–	11 (10.9%)	–	3 (3.0%)	–	–
Chang	–	–	GERD or WR (14, 21.5%)	11 (16.9%)	–	–	–	Hiatal repair (3, 4.6%)
Castagneto	4 (3.3%)	2 (1.7%)	NA (1, 0.8%)	2 (1.7%)	–	4 (3.3%)	–	OAGB (1, 0.8%)
Kowalewski	15 (1.5%)	1 (1%)	–	14 (14%)	–	–	–	OAGB (1, 1%), Band (1, 1%)
Felsenreich	22 (22.7%)	11 (11.3%)	–	31 (32.0%)	–	–	1 (1.0%)	Santoro's procedure (1, 1.0%)
Flato	6 (3.6%)	1 (0.6%)	–	1 (0.6%)	2 (1.2%)	4 (2.4%)	–	–
Noel	14 (10.1%)	9 (6.4%)	–	6 (4.3%)	12 (8.6%)	–	4 (2.9%)	SADI (1, 0.7%)
Mandeville	19 (21.6%)	5 (5.7%)	IWL and GERD (2, 2.3%)	26 (29.6%)	–	–	–	–
Schauer	–	–	Gastric leak (2, 4%)	1 (2%)	–	–	–	Jejunostomy (1, 2%)
Gadiot	38 (13.7%)	6 (2.2%)	–	44 (15.9%)	–	–	–	–
Garofalo	3 (10%)	–	Gastric stricture (2, 6.6%)	4 (13.3%)	–	–	1 (3.3%)	–
Lessing	2 (3.9%)	–	–	2 (3.9%)	–	–	–	–
Yilmaz	26 (5.2%)	6 (1.2%)	–	9 (1.8%)	23 (4.6%)	–	–	–
Arman	16 (25.4%)	4 (6.4%)	–	6 (9.5%)	3 (4.8%)	–	10 (15.9%)	Hiatoplasty (1, 1.6%)
Seiki	5 (2.8%)	1 (0.6%)	–	2 (1.1%)	–	–	3 (1.7%)	Saromyotomy (1, 0.6%)
Angrisani	7 (7.1%)	2 (2.0%)	–	5 (5.1%)	–	–	4 (4.0%)	–
Dakour	3 (3.9%)	–	–	–	2 (2.6%)	–	–	OAGB (1, 1.3%)
Casella	4 (2.6%)	–	–	–	–	4 (2.6%)	–	–
Doğan	21 (8.6%)	–	Dysphagia (2, 0.8%)	23 (9.4%)	–	–	–	–
Lee	6 (3.9%)	8 (5.2%)	Gastric stricture (1, 0.6%), Intactable diabetes (1, 0.6%)	–	–	–	–	NA (16, 10.3%)
Abd	37 (2.7%)	19 (1.4%)	–	24 (1.8%)	19 (1.4%)	–	–	Band (13, 0.9%)
Prevot	–	–	NA (11, 11.6%)	–	3 (3.2%)	–	8 (8.4%)	–
Boza	3 (1.9%)	–	Gastric stricture (1, 0.6%)	3 (1.9%)	–	–	–	DJB (1, 0.6%)
Sieber	8 (11.7%)	–	–	2 (2.9%)	–	6 (8.8%)	–	–
Rawlins	–	–	NA (4, 7.3%)	–	–	–	4 (7.3%)	–
Catheline	8 (15.1%)	–	–	5 (9.4%)	3 (5.7%)	–	–	–
Abbatini	7 (21.2%)	–	–	–	–	–	–	BPD (7, 21.2%)
Sarda	–	–	NA (4, 20%)	3 (15%)	–	–	1 (5%)	–
Bohdjalian	3 (11.5%)	1 (3.9%)	–	4 (15.4%)	–	–	–	–
Himpens	13 (31.7%)	–	–	–	2 (4.9%)	–	11 (26.8%)	–

7 (3,4%)

5

aosta



Sleeve Gastrectomy

Aosta

2006-2020

237

Sex m:f

91:146

Age

45.6(18-65)

Weight (kg)

137.9(92-256)

Height (cm)

164.5(138-188)

BMI

50.7

EW (kg)

79.1 (36.5-182)

Morbidity <30 gg

20 (10.7%)

fistola

1 (0.5%)



Sleeve Gastrectomy

RE-DO SURGERY

Aosta

2006-2020

15

Sex m:f

8:7

Age

45(34-57)

Weight (kg)

156(119-237)

Height (cm)

168(143-184)

BMI pre sleeve

50.7(35.4-91)

BMI pre-redo

43,2 (30,2-55,5)

% EWL

30,8%



SLEEVE	237	
RE-DO SURGERY after SLEEVE	15	
IWL	4	3 MINIBYPASS 1 LRYGBP
WR	4	4 LRYGBP
GERD	2	2 LRYGBP
2° STEP	4	1 LRYGBP 1 DBP 2 MINIBYPASS
LATE COMPLICATION (stenosis)	1	1DBP
REVISIONAL RATE	6,3%	



CONCLUSIONS

- **REDO AFTER SLEEVE INDICATIONS**
- IWL
- WR
- GERD
- COMPLICATIONS
- **REDO AFTER SLEEVE INTERVENTIONS**
- RYGBP
- RE-SG
- DBP
- DS
- **REDO AFTER SLEEVE GERD**
- RYGBP

