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Barbed vs. Conventional Sutures in Bariatric Surgery: Early and Late Outcomes

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Abstract: The implementation of barbed sutures appears to enhance the process of suturing and knot tying, particularly in the field of bariatric surgery, where they can offer significant advantages. The objective of this study is to evaluate the safety and effectiveness of utilising barbed sutures for gastric pouch-jejunal anastomosis (GPJA) and jejuno-jejunal anastomosis (JJA) anastomosis in Roux-en-Y Gastric Bypass (RYGB). Data from patients who underwent primary RYGB between January 2012 and October 2018 were retrospectively collected using Propensity Score Matching (PSM) to randomise groups (barbed sutures—BS-G and conventional sutures—CS-G). The primary outcome was postoperative early complications. The secondary outcomes were late complications (internal hernias and small bowel obstructions), operative time and postoperative hospital stay. A total of 969 patients were included. After PSM, 322 (161 in BS-G vs. 161 in CS-G) patients were compared (chi-square 0.287, $p = 0.862$). Postoperative early and late complications were comparable between the two groups. BS-G had a significantly shorter median operative time (65 vs. 95 min $p < 0.001$). Median postoperative hospital stay was significantly shorter for BS-G (2 vs. 5 days, $p < 0.001$). Barbed sutures effectively reduce the operation duration and are as safe as conventional sutures for closing anastomotic defects during RYGB.

Keywords: Roux-en-Y gastric bypass; bariatric surgery; barbed sutures; Stratafix^{TM}; intracorporeal anastomosis; gastric pouch-jejunal anastomosis; jejuno-jejunal anastomosis; leak; stenosis; small bowel obstruction

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1. Introduction

Laparoscopic suturing is widely considered as one of the most challenging and time-consuming tasks in laparoscopic surgery, even in experienced hands. The primary rationale pertains to the necessity of securing a knot inside a restricted area, frequently characterised by limited visibility [1–4]. Recently, an innovative, absorbable, knotless barbed suture has been introduced to facilitate suturing [5].

Obesity has become a widespread global epidemic, with its prevalence documented in over 30 countries [6,7]. Various treatments have been sanctioned to address the issue, and a growing body of research indicates that bariatric surgery is superior to medicinal or lifestyle therapy in terms of both weight loss and the remission of type 2 diabetes [8]. According to the literature, Roux-en-Y gastric bypass (RYGB) by laparoscopic approach is considered one of the most widely performed bariatric procedures globally, including around 45% of all bariatric procedures conducted in 2013 [9]. Despite the technique being standardised, there are two distinct procedures employed for the formation of the gastric

pouch-jejunal anastomosis (GPJA) and the jejuno-jejunal anastomosis (JJA): mechanical or hand-sewn methods [10]. The closure of enterotomies in tight and constrained places is necessary when performing lateral–lateral anastomosis with a linear stapler [11].

In our previously published series, we presented findings that support the safety and efficacy of utilising barbed sutures (specifically Stratafix™, Ethicon, Cincinnati, OH, USA) for the closure of the GPJA [12]. This approach was found to be comparable to conventional sutures in terms of operational time, postoperative complications, and duration of hospital stay. Following the initial encounter, we proceeded to implement the utilisation of barbed sutures for the closure of jejuno-jejunal anastomosis (JJA). It is important to note, however, that we were aware of the potential risk of postoperative small bowel obstructions (SBO) associated with the presence of suture extremities. By analysing the early and late postoperative complications and the effect of the procedure on operating time, this study seeks to determine the safety and efficacy of barbed sutures in comparison to conventional sutures in the closure of both enterotomies during laparoscopic RYGB, using propensity score-matching (PSM) analysis to simulate randomisation and make the groups more homogeneous in terms of preoperative variables.

2. Methods

A retrospective analysis was performed on prospectively collected data from a specific bariatric database, encompassing patients who underwent primary bariatric surgery at the Fondazione Policlinico Universitario Agostino Gemelli IRCCS between January 2012 and October 2018. This institution serves as a tertiary referral centre for bariatric surgery. Patients included in this study met the consensus criteria for bariatric surgery, accomplished the guidelines of the Italian Society of Bariatric and Metabolic Surgery (SICOb) [13] and underwent primary laparoscopic RYGB with the same type of suture (conventional vs. barbed) to close the enterotomies of both anastomoses. The patients were provided with comprehensive information regarding the surgical procedure, anaesthetic administration, potential effects, and associated problems. The multidisciplinary preoperative bariatric workup has been previously reported in detail [12]. Our analysis did not include patients who underwent RYGB as a revisional bariatric operation, bariatric procedures different from laparoscopic RYGB, and laparoscopic RYGB with mixed type of suture (conventional and barbed) to close the enterotomies of both anastomoses. For this study, follow-up was completed on 30 June 2023. Informed consent was obtained from all subjects involved in the study. The study was carried out in accordance with the principles outlined in the Declaration of Helsinki and received approval from our institutional Ethics Committee (Ethics Committee of Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Approval Code: ID3941, Approval Date: 28 May 2021).

2.1. Study Endpoints

The primary end-point was the comparison of barbed vs. conventional sutures in terms of early complication rate (30-day). The secondary endpoint was comparing the two groups in terms of late complications (internal hernias and small bowel obstructions), operative time and postoperative hospital stay.

2.2. Surgical Techniques

Two expert bariatric surgeons and a resident performed all procedures using the same standardised technique. A side-to-side GPJA and JJA were created using a laparoscopic linear stapler (Echelon Flex Powered® 60 mm, blue cartridge 3.5 mm size for GPJA, and white cartridge 2.5 mm size for JJA, Ethicon, Cincinnati, OH, USA). A double-layer running suture was performed to close the enterotomies of the two anastomoses. The monofilament absorbable 3/0 PDS (Ethicon, Cincinnati, OH, USA) for both the anastomoses was routinely used until December 2014, and the 2/0 monofilament unidirectional barbed absorbable suture (Stratafix™: spiral monocryl™ plus, Ethicon, Cincinnati, OH, USA) for both the anastomoses was used from October 2017 in all patients. The end of the suture is knotted

at both anastomoses. In order to assess potential leakage from the staple line and/or anastomosis, all patients had an intraoperative methylene blue test. A drainage system was strategically positioned along the GPJA in a systematic manner. Mesenteric defects and Petersen's defects were not systematically closed.

2.3. Post-Operative Protocol

A standard postoperative protocol personalised for bariatric patients was used and has been previously reported in extenso [12]. Additional individualised testing was deemed necessary, taking into consideration the individual post-operative clinical condition of each patient [14]. The Clavien–Dindo classification was utilised to assess the severity of postoperative complications [15]. The discharge and follow-up protocols have been previously described [12,16–18]. Demographic and clinical data, as well as perioperative results, were obtained by a comprehensive evaluation of patient documents and electronic databases.

2.4. Statistical Analysis

A retrospective case-control research was carried out, adopting propensity score matching (PSM) as a method of randomisation. To reduce the selection bias of the surgeon's experience and his improving ability over time, we enrolled patients only after a learning curve of 100 procedures, as reported in other series [19]. PSM was performed using the 1:1 nearest neighbour matching method (caliper = 0.2, discard = both groups). The suture type (barbed vs. conventional) was the binary treatment variable and so was entered into the regression model of PSM. Gender (male vs. female), BMI and age were included in the regression model as covariates that have been estimated to potentially affect our end-points. A bivariate analysis was conducted to compare the baseline characteristics, and operative and postoperative variables. The Shapiro–Wilks test was utilised to evaluate the normal distribution. Categorical variables were compared using Fisher's exact test and Chi-square test, while continuous variables were expressed as mean (±standard deviation, SD) or median (interquartile range, IQR). To compare continuous variables, a paired sample *t*-test or Mann–Whitney U test was used, depending on the data distribution of the analysed population. Statistical analysis and PSM were conducted with SPSS 22.0 software for Windows (SPSS Inc., Chicago, IL, USA). All analyses were two-tailed, and the threshold for statistical significance was set at $p < 0.05$.

3. Results

More than 1800 bariatric surgeries were carried out over the research period. Four hundred and twenty-one patients, 260 in the conventional suture group (CS-G) and 161 in the barbed suture group (BS-G), all met the inclusion criteria. After PSM, the study population comprised 322 patients: 161 in CS-G and 161 in BS-G. Table 1 shows the characteristics of the study population after PMS. The two groups were comparable for age, gender, weight, BMI and comorbidities, such as obstructive sleep apnea syndrome and high blood pressure. On the other hand, we registered differences in terms of type 1 and 2 diabetes mellitus in the two groups (see Table 1). No intraoperative deaths and no intraoperative leaks (detected at the methylene blue test) were registered. Postoperative complications were comparable for both groups: 4 (2.5%) for CS-G and 6 (3.7%) for BS-G ($p = 0.521$). We registered one case (0.6%) of GPJA's leakage in CS-G ($p = 0.5$) and one case (0.6%) of JJA's stenosis in BS-G ($p = 0.5$). The GPJA's leakage is described below (Clavien–Dindo V). Regarding the JJA's stenosis, this was a case of a 52-year-old woman with a normal upper gastrointestinal contrast study on POD (postoperative day) 1. She resumed feeding on POD 2; then, she developed abdominal pain and increased cholestasis indexes. Due to the worsening conditions, on POD 4, an abdomen CT scan with intravenous and oral contrast was obtained: this showed distension of the biliary loop and the excluded stomach, as for a JJA stenosis. Therefore, the patient was re-operated, and a new JJA was realised (Clavien–Dindo IIIb) with a post-operative uneventful course. Other postoperative complications were the following: one (0.6%) case of self-limiting extraluminal bleeding

(Clavien–Dindo II) in CS-G ($p = 0.317$) and two (1.2%) cases of self-limiting intraluminal bleeding (Clavien–Dindo II) in BS-G ($p = 0.159$), two (1.2%) cases of surgical site infections (Clavien–Dindo I and Clavien–Dindo II) in CS-G and three (1.8%) cases of surgical site infections (two Clavien–Dindo I and one Clavien–Dindo II) in BS-G ($p = 0.317$). Unfortunately, we observed one postoperative death for the detriment consequence of a systemic inflammatory response syndrome (SIRS) due to GPJA's leakage, as previously reported in extenso [12,20]. The median operative time was significantly shorter for BS-G: 65 (58–80) vs. 95 (80–125) minutes, $p < 0.001$. The median postoperative hospital stay was significantly lower for BS-G: 2 (2–3) vs. 5 (5–6) days, $p < 0.001$. Follow-up was completed in all patients (160 out of 160 patients for CS-G vs. 161 out of 161 patients for BS-G, respectively). The median follow-up time was shorter in BS-G: 60 (58–63) vs. 113 (117–119) months. During this period, we registered one (0.6%) case of small bowel obstruction in CS-G and one (0.6%) case in the other group ($p = 0.996$). The case reported in BS-G was a complication that occurred on POD 32, and it was caused by adhesions between the alimentary limb and the biliary limb cul-de-sac. Laparoscopic lysis of the adhesions was resolutive, and it was useful to exclude the extremity of the Stratafix^{TM} as the main cause of such complication. Nevertheless, we experienced a comparable rate ($p = 0.768$) of internal hernias requiring surgical revision: seven (4.3%) cases in CS-G and six (3.7%) cases in BS-G. The median time of onset of the clinical presentation of internal hernias in the entire series was 22 (19–32) months.

Table 1. Data and statistical analysis.

	CS-G	**BS-G**	***p*-Value**
Patients	161	161	
Age (years)	43 (37–50)	45 (36–51)	0.622
Weight (kg)	120 (108–130)	118 (107–135)	0.686
BMI (kg/m^2)	42.5 (39.5–45.9)	41.9 (39.6–45.8)	0.886
Male/Female	54 (33.5%)/107 (66.5%)	52 (32.3%)/109 (77.7%)	0.813
HBP (yes/no)	107 (66.5%)/54 (33.5%)	91 (56.5%)/70 (43.5%)	0.067
OSAS (yes/no)	107 (66.5%)/54 (33.5%)	91 (56.5%)/70 (43.5%)	0.067
Diabetes (no/type 1/type 2)	115 (71.4%)/0 (0%)/46 (28.6%)	126 (78.3%)/21 (13.0%)/12 (8.7%)	<0.001
Operative time (minutes)	95 (80–125)	65 (55–80)	<0.001
Postoperative hospital stay (days)	5 (5–6)	2 (2–3)	<0.001
Postoperative 30-day Complications (yes/no)	4 (2.5%)/157 (97.5%)	6 (3.7%)/155 (96.3%)	0.521
GPJA's leak (yes/no)	1 (0.6%)/160 (99.4%)	0 (0%)/161 (100%)	0.5
JJA's leak (yes/no)	-	-	
GPJA's stenosis (yes/no)	-	-	
JJA's stenosis (yes/no)	0 (0%)/161 (100%)	1 (0.6%)/160 (99.4%)	0.5
Intraluminal bleeding (yes/no)	0 (0%)/161 (100%)	2 (1.2%)/159 (98.8%)	0.159
Extraluminal bleeding (yes/no)	1 (0.6%)/160 (99.4%)	0 (0%)/161 (100%)	0.521
Surgical-site infection (yes/no)	2 (1.2%)/159 (98.8%)	3 (1.8%)/158 (98.2%)	0.317
Follow-up completed (patients)	160 out of 160 (100%)	161 out of 161 (100%)	-
Follow-up time (months)	113 (117–119)	60 (58–63)	<0.001
SBO (yes/no)	1 (0.6%)/159 (99.4%)	1 (0.6%)/160 (99.4%)	0.996
Internal hernia (yes/no)	7 (4.3%)/153 (95.7%)	6 (3.7%)/155 (96.3%)	0.768

CS-G: conventional suture group; BS-G: barbed suture group; HBP: high blood pressure; OSAS: obstructive sleep apnea syndrome; GPJA: gastric pouch-jejunal anastomosis; JJA: jejuno-jejunal anastomosis; SBO: small bowel obstruction.

4. Discussion

This retrospective cohort study presents a comparative examination of the use of conventional and barbed sutures for closing enterotomies during Roux-en-Y gastric bypass (RYGB) procedures. The study was conducted at a bariatric high-volume centre between January 2012 and October 2018.

Laparoscopic suturing is commonly regarded as a highly technical and laborious procedure within the realm of laparoscopic surgery. The primary rationale is the necessity to fasten a knot within a restricted space, sometimes characterised by a constrained field of vision. Moreover, it has been observed that laparoscopic knot tying, even if performed by skilled practitioners, is often accompanied by a significant failure rate [1–4]. The preservation of knot integrity holds significant importance in bowel anastomosis since its failure can result in severe problems, perhaps requiring additional surgical intervention. Consequently, this might lead to an extended recovery period and greater medical costs [21]. Several laparoscopic devices have been created with the aim of enhancing the efficacy of knot tying. These devices include the Endo-Stich (made by Covidien, in Mansfield, MA, USA), Lapra-ty absorbable suture clips (provided by Ethicon Endo-Surgery, Inc., Cincinnati, OH, USA), and extracorporeal knot pushers. Barbed sutures have been introduced within this particular context to enhance the process of laparoscopic suturing [3]. The concept of barbed sutures was initially conceived in 1951 for the purpose of repairing tendons. The initial barbed suture to receive approval from the Food and Drug Administration (FDA) was the Quill™ bidirectional barbed polydioxanone suture, developed by Angiotech Pharmaceuticals in the year 2004. This was then followed by the introduction of the V-Loc™ suture by Covidien in 2009 [12]. The most recent barbed suture to receive approval from the Food and Drug Administration (FDA) is Stratafix™, manufactured by Ethicon, Cincinnati, OH, USA. The effectiveness and appropriateness of barbed sutures have been documented in the fields of gynaecology, plastic surgery, urology, and orthopaedic surgery [3,22]. Barbed sutures have been documented to be utilised in colorectal surgery, such as in the closure of the pelvic cavity following abdominoperineal resection and rectal wall closure in trans-anal endoscopic microsurgery [23,24]. Barbed devices are not correlated with the necessity of knots at the initiation or termination of the suture line, hence mitigating technical challenges and complexities related to knots. Moreover, barbed sutures effectively distribute stress throughout the suture line and ensure fixation with each passage.

In the present scenario, as previously documented, we systematically implemented the utilisation of Stratafix™ in our clinical setting starting in January 2015 for the purpose of closing the enterotomy of GPJA in patients undergoing gastric bypass procedures, including both RYGB and One-Anastomosis Gastric Bypass. This approach facilitated the suturing process by eliminating the need for knots and reducing reliance on external assistance during the construction of the anastomosis [12]. We did not use it before this reported experience to avoid potential complications such as small bowel obstruction, as reported elsewhere [25]. In our previous retrospective-control study, conducted by means of PSM analysis to reduce sample selection bias, we reported shorter operative time using barbed sutures, with comparable early postoperative complications [12]. Hence, our research findings substantiate our endorsement of the utilisation of barbed sutures as a secure and efficient technique, comparable to traditional sutures in relation to the incidence of postoperative complications. Moreover, this technique offers other discernible benefits, particularly in terms of minimising the duration of the surgical procedure. Furthermore, unpublished follow-up data of our series demonstrated that the incidence of small bowel obstruction was comparable between groups without adverse events due to terminal parts of barbed sutures. For these reasons, in October 2017, we decided to introduce Stratafix™ firstly to close the enterotomies of JJA too, then for the anastomosis reconstruction of the SADI-S (Single Anastomosis Duodenal-Ileal Bypass with Sleeve Gastrectomy), and more recently during RYGBs with Hugo™ RAS (Medtronic, Minneapolis, MN, USA), a novel robotic platform recently introduced in our hospital [16,17,26,27].

Concerning the study's primary outcome, we found comparable postoperative early complication rates between the two groups. We did not observe GPJA's and JJA's leakages in BS-G. We registered one case of JJA's stenosis, as previously reported. This complication rate is comparable with the control group (CS-G). Similar results are reported in other series. Milone et al. reported comparable results in terms of postoperative complications between the two groups [28]. In the study of Tyner et al., the authors reported an equivalent 30-day complication rate between groups, and there were no instances of anastomotic leakage or stenosis seen [21]. De Blasi et al. observed that there was no occurrence of either fistula or anastomotic stenosis within six months post-surgery in both groups [3]. The meta-analysis of Lin et al. did not show significant differences in terms of postoperative complications: a total of 37 cases with stenosis were reported in only two papers, and the statistical analysis did not reveal any significant findings. In terms of leakage, the combined analysis of all seven studies did not indicate a statistically significant association between the type of suture used and the occurrence of this complication [5]. Moreover, subgroup analysis also suggested similar results, regardless of RYGB and sleeve gastrectomy. In contrast with the rate of bleeding reported in the study of Lin et al. (which demonstrated a reduction of bleeding in barbed groups), in our analysis, we registered one (0.6%) case of self-limiting extraluminal bleeding (Clavien–Dindo II) in CS-G and 2 (1.2%) cases of self-limiting intraluminal bleeding (Clavien–Dindo II) in BS-G but without significant differences [5]. The likely cause of this is the utilisation of barbed sutures exclusively for the purpose of closing enterotomies, while the anastomosis is mechanically accomplished.

In this study, we experienced an even shorter operative time using barbed sutures. Similar results were reported from the study of Constantino et al., a large consecutive series of RYGB comparing V-Loc and multifilament conventional sutures [29]. Also, in the study of Milone et al., using V-Loc suture for the construction of gastro-jejunal anastomosis during RYGB, the duration of anastomosis was found to be considerably shorter in the barbed group compared to the control group [24]. In contrast, no significant differences were found between the two groups in terms of operative time. Similarly to our result, in the study of Tyner et al., a retrospective analysis compared standard vs. barbed sutures for GPJA and JJA and the mean operation duration time was moderately reduced in the barbed suture group [21]. Moreover, the meta-analysis of Lin et al., of more than 26,000 patients who underwent RYGB or sleeve gastrectomy, showed that the barbed suture group was associated with a shorter suture time and operative time compared to the control group [5]. In our opinion, barbed sutures were associated with shorter operative time due to the knotless technique and with no requirement for assistance in maintaining suture tension. The assessment of the correlation between external assistance and the utilisation of barbed sutures is a difficult task. However, it is plausible to propose that, when the suturing procedure is executed by the operator, it leads to a reduction in operative duration and yields favourable outcomes in the post-surgical phase. Moreover, Velotti et al. recently published a review with metanalysis concerning the outcomes of barbed vs. conventional sutures in colorectal and bariatric surgery, involving 12 studies with 27,133 patients [30]. They found comparable leakages, bleedings and stenosis rates between the different suture groups, with shorter operative time for barbed ones. In more detail, the meta-regression analysis showed that, either in colorectal or bariatric operations, the findings of this study were not influenced by the demographic parameters of patients or the oncological characteristics of neoplasms. It is important to take into account the impact of the learning curve on our results over time. Some recent studies have shown that the RYGB learning curve is completed after 500 cases, resulting in a gradual reduction in operative time [16,17,26]. Thus, this factor may have also influenced our findings.

We reported shorter postoperative hospital stay for BS-G, as reported in other series [21,31,32]. In contrast, in the study of Lin et al., the results of the survey conducted on a sample size of 26,925 cases did not demonstrate statistically significant advantages of barbed sutures compared to standard sutures [5]. Nevertheless, we ascribed the shortening of hospital stay observed in BS-G as probably due to the application of enhanced recovery

after surgery protocols through the years. In fact, our clinical practice has shifted from a discharge on postoperative days 3–4 to the current discharge between postoperative days 1 and 2 [12,16–18].

One notable limitation of this study is its retrospective design, which encompassed a total of six years. During this period, patients were assigned to either the CS group or the BS group in a consecutive way. This led to a significant difference in terms of median follow-up between groups, though a follow-up of at least 55 months was completed in all patients. A comparable internal hernia rate was reported between the two groups, where the median onset time is 22 months after surgery, with a significantly lower onset timing compared to the short follow-up recorded in the entire series.

The introduction in our clinical practice of Stratafix™ is relatively new. One of the secondary outcomes of the analysis is the evaluation of long-term complications, particularly the incidence of small bowel obstructions. According to existing research, there have been documented instances of secondary obstruction occurring after the use of barbed sutures. This is likely attributable to the interaction between the barbed material and bowel loops, since the peculiar surface characteristics of the barbed sutures may attract and create entanglement with the intestinal loops [33–35]. Delving deeper into this topic, the evidence in the literature is scarce, consisting mainly of case reports [33–38]. Recently, Clapp et al. published a review of 18 cases of small bowel obstruction due to barbed sutures [36]. The authors demonstrated that the four most often performed surgical interventions (with a total of four each) were inguinal surgeries, myomectomy, hysterectomy, and pelvic floor reconstructive procedures. In our experience, we reported no difference in terms of small bowel obstruction between the two groups. Moreover, the incidence of this complication in our series is very low. This suggests, considering also the length of follow-up, that barbed sutures may not represent a potential risk factor for small bowel obstruction after RYGB, compared to conventional sutures.

The current study has the advantage of being a case-control, comparative study conducted at a referral centre for bariatric surgery. It encompasses an extensive collection of clinical data related to minimally-invasive procedures. The main cause of bias in multicenter research, including meta-analyses, may arise from the heterogeneity in selection criteria, such as variations in surgical methods, techniques, and the use of different types of barbed and conventional sutures. Additionally, the clinical management and experience across different centres can also contribute to this bias. One of the strengths of our research lies in the homogeneity of the supplied data.

Nevertheless, it is important to acknowledge the various limitations included in this study. The present series is a retrospective, non-randomized study that encompasses individuals who underwent surgery over an extended duration. A propensity score was utilised to ensure suitable matching of cases in order to overcome the issue of randomisation.

Secondly, the definition of the correct sample size is critical. Delving deeper into this topic, taking into account our postoperative complication rates, a significance level (α) of 5%, a power (1-β) of 90%, and a non-inferiority limit (d) of 1.5%, 1412 patients would be required to achieve a non-inferiority study analysis (see: Sealed Envelope Ltd., London, UK, 2012. Power calculator for binary outcome non-inferiority trial. Available from: https://www.sealedenvelope.com/power/binary-noninferior, accessed on 5 August 2023).

Lastly, we did not perform a completed cost analysis [39,40]. From our perspective, the utilisation of the barbed suturing technique did not result in a major change in the cost associated with the procedures. Indeed, the primary theoretical expense associated with sutures is offset by the relatively minimal duration of the surgical procedure, thereby diminishing the overall utilisation of the operating room. Our results are similar to those reported in the study of Lin et al. indicating that barbed sutures may be cheaper than conventional ones, but the authors concluded that these results need to be interpreted cautiously [3].

5. Conclusions

This study promotes the routine use of barbed sutures to close the enterotomies of both anastomoses during RYGB as a safe and effective technique for dealing with early and late postoperative complications. Moreover, in our experience, similarly to others reported in the literature, we obtained some clear advantages with barbed sutures, including an important reduction of operative time. Although further prospective randomised studies with appropriate sample sizes are needed to confirm our results and to perform a proper cost analysis, we encourage using barbed sutures over conventional ones during anastomotic reconstructions in bariatric operations.

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