

Point-by-point response to the comments of the reviewers:

Comments to authors 1:

Thank you for your careful review and professional questions.

1. In introduction, I would question the statement, “*The prevalence of hemorrhoids is reported to be between 40% and 80%*”. Are these symptomatic hemorrhoids? People who seek medical attention? Seems like a high number to quote given the range in the literature.

Answer: Sorry for making you confused because our inaccurate representation. We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

The prevalence of hemorrhoids is reported to be about 40%, and even as high as 80% in asymptomatic hemorrhoids [1,2]

Reference 1: “The clinical records of 835 patients were reviewed. Five hundred ninety four had symptoms of hemorrhoids (symptomatic group) and 241 had no symptoms (asymptomatic group). Eighty-six per cent of the entire group had hemorrhoids, 88 per cent among the symptomatic group and 82 per cent among the asymptomatic group.”

Reference 2: “Hemorrhoids are a common condition in the adult population and may be found in 40% of the screening colonoscopies performed in England.”

2. In introduction, I think some editing is needed for, “*Hemorrhoids with grades I / II are mainly treated conservatively, while grade III/IV hemorrhoids require selective treatment based on the individual’s symptoms and complications. Surgery is the treatment of choice if there is active bleeding or persistent prolapse of the hemorrhoids. There are currently many types of surgical treatments for hemorrhoids, with traditional hemorrhoid operations consisting of Milligan–Morgan^[4] or Ferguson procedures, rubber-band ligation, and diathermy hemorrhoidectomy^[5]*”. What is meant by “selective” treatment? Surgery is the treatment “of choice” only if failing less aggressive treatments. RBL is not a “surgical treatment”. What is exactly the difference between diathermy hemorrhoidectomy compared to MMH?

Answer:

(1) We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

Treatment of hemorrhoids requires selective treatment based on individual symptoms and complications, and most patients with hemorrhoids(grade I/II) can be treated conservatively, including dietary changes with sufficient fluids and fiber, while limiting prolonged toilet use. Surgery is still the treatment of choice for patients who fail conservative treatment and those who have grade III or IV hemorrhoids with active bleeding or persistent prolapse.

(2) What is exactly the difference between diathermy hemorrhoidectomy compared to MMH?

According to references 6-7 of our article, diathermy hemorrhoidectomy requires the use of diathermy and does not involve ligation of the vascular during the procedure.

Reference 6: “A finger is passed into the anal canal supporting the haemorrhoidal mass to be excised.” and “It is not necessary to ligate the pedicle of the haemorrhoid because coagulation achieves adequate haemostasis.”

Reference 7: “The first step of the operation is the superficial marking of mucosal bridges with diathermy.”

3. At end of introduction, “*The aim was to determine which was the superior procedure based on therapeutic efficacy and patient satisfaction.*” This statement doesn’t add anything. Either remove it or be more specific with aims.

Answer: We've removed that part of the article.

4. Under Materials and Methods, Patient population section: I think we need to know the number and % of patients who had prior hemorrhoid surgery? Also, how was the decision made to do one procedure vs another? Do different surgeons favor different procedures? Maybe show which surgeons did what type of procedure (number and %) and did this change over the 2 years of your study? If one surgeon only does one type and another surgeon favors another type, is difference partially due to the surgeon and not the technique?

Answer:

(1) The number and % of patients who had prior hemorrhoid surgery?

Patients who had previous perianal surgery were not included in this study.

(2) The choice of operation is based on the attending surgeon ' assessment of the patient's condition and the patients' wishes. These three types of procedure are performed by one surgical team led by an experienced chief surgeon of the anorectal surgery. All three surgical techniques are mature and stable. Although the three surgical methods have corresponding postoperative complications, patients with post-operative complications are able to receive relief from subsequent treatment.

5. Under Surgery section: I see you are quoting the original Longo paper, "*For original PPH, purse-string sutures were applied 4 cm from the dentate line*". Have other authors recommended different heights or variations of heights depending on the patient (i.e., male vs female, length of anal canal) and the disease (grade 3 vs 4)? I have done many PPHs over the past 20 years. My goal has usually been to place the staple line about 1 - 2 cm above the dentate line, to achieve goals as you describe.

Answer: We searched for the literature about PPH in recent years and found that more and more surgeons were designing the staple lines based on the patients' conditions. Our results also confirm that a lower staple line results in a better lift, which is consistent with your 20 years of clinical experience.

Reports of low staple line:

(1) "Observation on the effect of modified stapler Hemorrhoidectomy in the Treatment of Moderate and Severe Hemorrhoids"

---Place the staple line about 1 - 2 cm above the dentate line.

(2) "Comparison of the efficacy of modified stapler circumferential hemorrhoidectomy and traditional hemorrhoidectomy in the treatment of moderate and severe hemorrhoids"

--- Place the proctoscopic suture (PAS33) through the CAD33 with the staple line about 1 - 2 cm above the dentate line.

6. Under Recurrence of prolapse hemorrhoids: I would appreciate clarification as to what defined recurrence? Symptoms detected by phone call or office visit? Need for further therapy? Need for another procedure? Need for further surgery? At what time period did people tend to fail?

Answer: In Materials and Methods, we added the definition of the postoperative recurrence of hemorrhoids and marked it in red in the corresponding place in the article.

postoperative recurrence of hemorrhoids(continuous prolapse of perianal mass or hematochezia recurred after hemorrhoidectomy).

Patients with complaints were invited to the outpatient clinic for evaluation of the recurrence of hemorrhoids and assessment of anal dysfunction. Recurrence was based on the surgeons' examination. Reoperation was based on surgeons' evaluation and the patients' wishes. The options of treatment for a symptomatic recurrence are as follows: sclerotherapy was performed in second-degree hemorrhoids, whereas patients with third-degree recurrence underwent the MM procedure.

In the Results, we added the situation of patients with recurrent reoperation and marked it in red in the corresponding place in the article.

Recurrent prolapse was successfully treated using MM surgery in 5 of 22 patients (22.7%) of the MMH group. The remaining 17 patients (77.3%) with recurrent symptomatic second-degree hemorrhoids were treated with sclerotherapy. 15 of the 60 patients (25%) in the PPH group had a recurrent symptomatic third-degree hemorrhoids and underwent MM surgery. 45 patients (75%) with recurrent second-degree hemorrhoids were treated with sclerotherapy. 13 patients (67.5%) in the M-PPH group had recurrent symptomatic third-degree hemorrhoids and underwent MM surgery. The rest 27 of the 40 patients (32.5%) with recurrent second-degree hemorrhoids were treated with sclerotherapy.

Overall, the reoperation rates were 1.3%, 4.7%, and 2.8% in the MMH, PPH, and MMH groups, respectively ($P < 0.001$). None of these patients experienced any further recurrences during the follow-up period.

7. Under discussion, this sentence is too simplified: “*However, PPH is associated with high postoperative recurrence and serious long-term postsurgical complications*”. All types of hemorrhoidectomy are associated with a similar level of recurrence and complications (as your data shows). Using “high” and “serious” to describe PPH vs MMH complications is not accurate.

Answer: Thank you for your valuable review comment, our formulation are indeed being not accurate. We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

However, high postoperative recurrence and serious long-term postsurgical complications have been reported.

Reference 2: “Importantly, PPH showed the weakest effects on reducing recurrence rates in hemorrhoid patients.”

Reference 16: “Procedure for prolapsing hemorrhoids (PPH) and stapled transanal rectal resection for obstructed defecation (STARR) carry low postoperative pain, but may be followed by unusual and severe postoperative complications. In conclusion, complications after PPH and STARR are not infrequent and may be difficult to manage.”

Reference 17: “there was increase in the recurrence of hemorrhoids at one year or more after stapled procedure (5.7 vs. 1 percent; odds ratio, 3.48; $P = 0.02$)”

8. It might be helpful to have a cartoon or diagram showing the difference between PPH and M-PPH.

Answer: Unfortunately, we don't have a professional draughtsman to make a vivid representation of our intentions, and we hope to learn from your comments and add visual images in future articles!

9. Under Discussion: This sentence should be modified or removed, *“We showed that the M-PPH is superior to traditional surgery for severe hemorrhoids (stage III/IV), resulting in a low rate of anastomotic bleeding and recurrence, and a very high rate of patient satisfaction.”* You have not showed it is superior, you have showed there are some pros and cons depending on what you are talking about.

Answer: We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

We showed that the M-PPH is superior to traditional surgery for severe hemorrhoids (stage III/IV) in rate of anastomotic bleeding, recurrence, and patient satisfaction.

10. Under Discussion: you attribute longer hospital stay to increased postop pain in M-PPH group. I believe you are talking about more of visceral pain with PPH vs more of somatic pain with M-PPH due to involvement of anal mucosa. Despite this, your VAS (I presume 0-10) shows a difference of pain scores on POD 5 of 2 for MMH, 1 for PPH and 1 for M-PPH. This does not seem to explain LOS differences on post-operative days 6, 7, and 8. Also, statistical difference is not the same as clinical difference. Is there a clinical difference between VAS score of 1 vs 2? This should be addressed.

Answer: We designed the VAS scores to be evaluated on postoperative days 1, 3, and 5 during hospitalization but did not go on to count the pain scores on days 6, 7, and 8 because some patients were discharged on POD 5-6.

There is a clinical difference between VAS score of 1 vs 2. This is an actual patient evaluation and feedback and may be subjective. The visual analog scale scores in Table 2 are expressed as medians (ranges) hopefully not causing you any confusion.

11. Under Discussion: remove the sentence *“This is probably the most logical reason for the significant reduction in bleeding.”*

Answer: Thank you for your careful review. We've removed that part of the article.

12. Under Discussion: this is not a conclusion, but a theory: “ *With the anastomosis scarring, the anal cushions near the dentate line are turned inward and are better fixed. The double purse-string sutures also allow for more tissue traction towards the rectum, with more effective lifting by the anal cushions.*” Should be stated as such.

Answer: We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

With the anastomosis scarring, the anal cushions near the dentate line are turned inward and are better fixed, while the double purse-string sutures also allow for more tissue traction towards the rectum for more effective lifting by the anal cushions^[24].

Reference 24: “The anal cushion is turned inward near the dentate line for better fixation with scarring of the anastomosis.”

13. Under Discussion: What is a “skin marking”?

Answer: The skin marking is skin tags. We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

14. Under Discussion, I believe this is an incorrect sentence: “*Anal incontinence is a latent complication of all hemorrhoidectomies.*” It is a possible complication, not a “complication of all hemorrhoidectomies”

Answer: We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

Anal incontinence is a potential complication of hemorrhoidectomies. The progression of anal incontinence after hemorrhoidectomy seems to be multifactorial.

15. Under Discussion: You should provide more data for this statement: *“No serious postoperative anal incontinence was observed in our study. Patients only exhibited decreased control of gas and fluids, and the frequency and severity of this complication improved with time and early postoperative training of the levator ani muscle”*

Answer:

Sorry for making you confused because our definition of anal incontinence isn't particularly precise. In the final statistics we classified all patients, who exhibited or complained anal wetness and poor control of gas and fluid as anal incontinent. Therefore, we concluded that “no serious postoperative anal incontinence was observed in our study”. In the revised manuscript, we've subdivide the concepts of discharge and incontinence to be more rigorous and scientific. Revisions have been made and are marked in red in the corresponding places in the Methods, Results and Discussion.

In our follow-up, patients who complained of fecal incontinence showed only perianal moist discomfort or decreased control of gas and fluids, and their symptoms were improved within six months.

MATERIALS AND METHODS : (1) postoperative anal discharge (wet anus or anal discharge caused by the scar left by the surgery), (2)postoperative sensory anal incontinence (lack of control over defecation, resulting in unconscious discharge of gas or stool)

RESULTS: The incidence of postoperative anal discharge was higher in the PPH group (6.2%) than in the other groups, but the difference were not statistically significant(Fig. 5a). During the follow-up period, anal discharge or incontinence improved after six months in all of these patients.

DISCUSSION: No serious loss of anal control was observed in our study. Patients only exhibited perianal moist discomfort or decreased control of gas and fluids, and the frequency and severity of the symptoms gradually disappear 6 months after surgery.

16. Did you look at amount of muscle in specimens? % of specimens with muscle? This might be important to comment on as you are doing a lower excision, and if muscle is involved, it will be internal anal sphincter and not simply circular muscle of the distal rectum.

Answer: The depth of the purse-string sutures of the M-PPH was only in the rectal mucosa and did not involve the internal anal sphincter muscle. This was also confirmed by our postoperative pathology, which reported that the rectal mucosa was seen in the upper incision margin and the plexus tissue of the anal pad was seen in the lower incision margin.

17. I think this paragraph and data in table 4 should be removed or explored and explained in more detail. Your table shows patients with more complications were more often “satisfied”.

Answer: We've removed that part of the article.

18. *“In summary, this study found that, within the follow-up period of 5 years, M-PPH has many advantages, including a **higher effectiveness**...”* “this wording needs to be more specific.

Answer: We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

In summary, this study found that, within the follow-up period of 5 years, M-PPH has many advantages, including a lower recurrence rate and a higher patient satisfaction rate than conventional PPH.

19. *“We therefore conclude that M-PPH is a better choice for treatment of severe hemorrhoids.”* Might want to change this sentence to be more specific for which patients, or remove it.

Answer: We've removed that part of the article.

20. Reference 26 is a duplicate reference

Answer: Thank you for your careful review. We have revised it in the References section.

21. What is your definition of postop anastomotic bleeding in this study? Patient report? % or absolute drop in hemoglobin? Need for transfusion? Return to OR? Readmit?

Answer: Sorry for causing your confusion due to our unclear description. We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

anastomotic bleeding(anastomotic hemorrhage found by anoscopy)

It could not be effectively stopped by conservative treatment such as compression hemostasis. We did not perform routine blood tests on these patients.

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22. Similarly, what is your definition of anal incontinence in this study?

Answer: Sorry for making you confused because our definition of anal incontinence isn't particularly precise. In the revised manuscript, we've subdivide the concepts of discharge and incontinence to be more rigorous and scientific. Revisions have been made and are marked in red in the corresponding places in the methods, results and discussion.

MATERIALS AND METHODS : (1) postoperative anal discharge (wet anus or anal discharge caused by the scar left by the surgery), (2)postoperative sensory anal incontinence (lack of control over defecation, resulting in unconscious discharge of gas or stool)

RESULTS: The incidence of postoperative anal discharge was higher in the PPH group (6.2%) than in the other groups, but the difference were not statistically significant(Fig. 5a). During the follow-up period, anal discharge or incontinence improved after six months in all of these patients.

DISCUSSION: No serious loss of anal control was observed in our study. Patients only exhibited perianal moist discomfort or decreased control of gas and fluids, and the frequency and severity of this complication improved with time and early postoperative training of the levator ani muscle.

Comments to authors 2:

Thank you for your careful review and professional questions.

1.purse string is said to be done 0.5 to 10 cm above the dentate line. I think you ment 1 cm and not 10. Correct? the other is said to be done 0.5 cm away from the first. Please indicate wheter is distal (internal) or proximal (external) to the first purse string.

Answer: We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

For M-PPH (Fig. 1), double purse-string sutures were inserted: one was 0.5–1.0 cm above the dentate line, the other was 0.5 cm from the distal of the first purse-string suture.

2.Results: Mean follow up is 5 +- 0.5 years, but the range informed is 4-5 years. There has to be some mistake since some patients according to the mean follow up hace longer follow-up times than what is expressed in the range.

Answer: Sorry for making you confused due to our mistake. We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

The mean follow-up period was 5 ± 0.5 (range: 4–6) years.

3.Postoperative pain: please clarify what SNK is for.

Answer: Sorry for making you confused due to our mistake in the choice of our statistical method. The VAS are three groups of non-normal distribution data and are expressed as medians (ranges). Kruskal-Wallis H tests were used for variables with non-normal distributions, to assess differences in the VAS between the MMH, PPH, and M-PPH groups(all pairwise for multiple comparisons). We have modified the text of the paragraph and marked it in red in the corresponding place in the article.

Kruskal-Wallis H tests were used for variables with non-normal distributions, to assess differences in the VAS between the MMH, PPH, and M-PPH groups(all pairwise for multiple comparisons).

4.Discussion Please comment why the patients have such admission times.

Answer:

As the discussion section of our article - Length of Hospital Stay, the length of hospital stay of patients is mainly related to the continuation of postoperative pain. The prolonged pain after MMH is because it involves the removal of perianal skin. As reported in other research papers, the length of stay and lost workdays significantly increased after MMH.

For M-PPH, a lower staple line and a lower position of the double-holster suture tend to be correlated with a higher postoperative pain score result in more longer length of hospital stay.

Preoperative tests were completed within the first two days of hospitalization, including chest radiographs, electrocardiograms, routine blood tests, biochemical tests, infectious markers as well as anesthesia consultations. In addition, the lack of home care and Chinese traditional ideas may prolong the postoperative hospital stay to some extent.

Reference 10: “Mean inpatient stay was lower in the group assigned to stapled as opposed to conventional haemorrhoidectomy (1.09 [0.3] vs 2.82 [0.09] nights, $p < 0.001$), experienced less pain overall ($p = 0.003$), and returned to normal activities sooner (8.1 [1.53] vs 16.9 [2.33] days, $p < 0.005$).”

Reference 11: “Stapled hemorrhoidopexy has a shorter inpatient stay (weighted mean difference, -1.02 days; 95 percent confidence interval, -1.47 to -0.57; $P = 0.0001$), operative time (weighted mean difference, -12.82 minutes; 95 percent confidence interval, -22.61 to -3.04; $P = 0.01$), and return to normal activity (standardized mean difference, -4.03 days; 95 percent confidence interval, -6.95 to -1.10; $P = 0.007$). Studies in a day-case setting do not prove that stapled hemorrhoidopexy is more feasible than conventional hemorrhoidectomy.”