http://dx.doi.org/10.35630/2199-885X/2021/11/6.17

ORIGINAL SUBMUCOSAL SUTURE IN THE TREATMENT OF GRADE IV HEMORRHOIDS DURING MUCOPEXY: CLINICAL RESULTS AND POSTOPERATIVE PAIN SYNDROME

Received 16 September 2021;
Received in revised form 18 October 2021;
Accepted 23 October 2021

Nikolay Kostenko ✉, ***Victor Maslennikov,***
Anna Yasenyavskaya

Astrakhan State Medical University, Astrakhan, Russia

✉ *kostenki@mail.ru*

ABSTRACT — In a comparative clinical study the effect of the method of desarterization with mucopexy in the minimally invasive treatment forgrade 4 hemorrhoidaldisease on the postoperative period was studied. The authors proposed an original patented submucosal suture with a minimal tissue trauma. It enables to achieve radical desarterization while preserving the anatomical structures of the surgical anal canal. A statistically significant decrease in pain syndrome in the postoperative period was shown in comparison with the use of a conventional twisted suture, as well as a decrease in recurrence of prolapse and bleeding.

KEYWORDS — hemorrhoids, hemorrhoidal disease, hemorrhoidal artery ligation, rectoanal repair, mucopexy.

INTRODUCTION

Surgical intervention HAL-RAR (hemorrhoidal artery ligation, recto-anal repair) as an effective method of minimally invasive treatment is an alternative to traditional hemorrhoidectomy for the treatment of hemorrhoidal disease (haemorrhoidaldesease - HD) for 2 [10, 14] and even 3 and 4 stages of the disease [1, 2, 3]. In most cases it combines low trauma and a comfortable postoperative period for the patient, as well as ease of implementation for the surgeon [1, 4].

The technique of the HAL-RAR procedure is currently unified and consists in the Doppler-controlled ligation on the terminal branches of hemorrhoidal vessels and mucopexy by forming a twisting suture on the mucous-submucosal layer in the area of the internal hemorrhoidal node [7, 11, 12]. At the same time, the method is not without its drawbacks in the form of postoperative pain syndrome when the anorectal line receptor apparatus is drawn into the coiled suture, as well as in a number of cases of postoperative bleeding during its eruption [8].

If at stage 3 of hemorrhoids the HAL-RAR operation has indisputable advantages over hemorrhoidectomy, the efficiency is at the level of 94–95%, then at stage 4 HD, due to the greater mass of hemorrhoidal tissue, the standard RAR demonstrates a decrease in efficiency to 89–91%, which necessitates repeated interventions already in every 10 patients [6].

These problems were identified during the accumulation of clinical material and meta-analyzes of recent years [8, 9, 13], which currently makes us reconsider the indications for the use of RAR surgery and look for options for preventing complications, especially in patients with stage 4 hemorrhoidal disease, especially in the presence of recurrent hemorrhoidal bleeding, including in comorbid patients [5].

The aim of research

was to improve the treatment outcomes in patients with grade IV chronic hemorrhoids by using a modified mucopexy with a submucosal suture in the lower ampullar rectum combined withtransanaldoppler-controlled desarterization of internal hemorrhoids.

MATERIALS AND METHODS

When performing the RAR procedure, an original submucosal suture was developed and applied using only three injections with atraumatic thread with absorbable 2/0 material in the form of a triangle directed apex towards the ligated terminal branch of the hemorrhoidal artery. The main difference from the twisted suture used in the traditional RAR procedure was a decrease in the zone of ischemia of the mucous-submucosal layer when tightening the ligature, as well as improved visual control of the possible entry of fragments of the anorectal line into the suture. These two conditions were aimed at preventing complications and undesirable consequences of the RAR procedure associated with pain syndrome and possible postoperative bleeding.

The study group consisted of 68 patients operated on from January 2017 to December 2019 for grade 4 hemorrhoidaldisease. According to the classification of Yu.A.Shelygina et al. (2015), patients were classified as stage 4A hemorrhoids with a border between

external and internal nodes. The main clinical manifestations were prolapse of internal nodes during bowel movements and physical activity and the presence of external nodes, as well as the release of blood during bowel movements and prolapse.

A prospective cohort study was carried out with the division of patients into 2 groups. In the test group, 34 patients used the "Method for minimally invasive treatment of patients with stage 3 and 4 hemorrhoids" (RF patent dated May 25, 2015 No. 2553937). The control group also included 34 patients who underwent doppler-controlled desarterization with mucopexy of internal hemorrhoids with a twisted suture. In both groups the age, gender, severity of clinical manifestations and objective criteria of hemorrhoids, the nature of concomitant diseases were comparable.

The mean age was similar in the main and control groups (main — 53.5 (41.1–65.9) years, control — 52.4 (37.8–67.0) years, p = 0.97), gender the structure also did not differ significantly (p = 0.16).

In the postoperative period, 24 hours and 7 days after the intervention, the severity of the pain syndrome was recorded according to the visual analogue scale (VAS) (Numerical Rating Scale, NRS). An indication for the administration of an analgesic was pain syndrome of 3 or more points on the VAS scale. The number of patients who required pain relief one day after the intervention was assessed which reflected the possibility of the patient returning to their normal activities.

Bleeding after the procedure was assessed as the presence or absence of bleeding during bowel movements on the 3rd, 15th, 60th days after desarterization with mucopexy. Possible long-term recurrence of prolapse of internal hemorrhoids was assessed 6 and 12 months after surgery. Indications for repeated interventions were also determined due to the persistence of the symptoms of falling out bleeding hemorrhoids.

Statistical processing of the obtained results was carried out by parametric and nonparametric methods, taking into account the type of distribution of quantitative data, using Student's t-test and Fisher's exact test, odds ratio (OR) with a 95% confidence interval (95% CI). Results are presented as mean (M) and standard deviation (SD). The critical value of the significance level (p) is taken as $p \leq 0.05$.

RESULTS AND DISCUSSION

The course of the early postoperative period in most patients of both groups was characterized by a moderately severe pain syndrome, in some cases there was bleeding after defecation, in some observations in the long term after the operation, a recurrence of prolapse of internal hemorrhoids was revealed.

When comparing the observation groups, the intensity of pain syndrome in 24 hours after the operation, as well as on the 7th day, differed. Thus, in the main group, one day after desarterization with mucopexy, the pain index on the VAS scale was 2.5±0.22, in the control group — 3.47±0.21 (p = 0.02). The number of patients with a VAS score of 3, which required the appointment of analgesics, was 16 in the main group and 26 in the control group one day after the intervention. The odds ratio (OR) was 3.250 (95%, CI: 0.097–0.774).

A week after the intervention, when interviewing patients of the main group, the majority of pain syndrome was absent or insignificant (on average on a scale of 0.62±0.12), and in the control group it remained in half of the patients at a level of 2 or more (on average 1.35±0.16), the differences are also statistically significant ($p<0.01$).

A decrease in the severity of pain syndrome after surgery is an indicator of less trauma when a submucosal suture is imposed with the possibility of visual assessment of threading without capturing the receptor zones of the anal canal. This factor increases the comfort of the postoperative period for the patient and is an important factor when choosing an intervention by the surgeon.

The discharge of blood during defecation was recorded on the 3rd, 15th and 60th days after the operation and was considered significant in the case of self-isolation of liquid blood or clots visually determined with fecal masses. It is known that after mucopexy with a grafting suture, this phenomenon is described by the authors and is considered objectively as traumatic of the intervention.

In 3 days after the intervention, bleeding was noted in 9 patients of the main group and 19 patients in the control group (OR = 0.284, 95% CI: 0.103–0.788). This indicator was considered important in the treatment tactics, since against the background of the initial anemia, which served as an indication for surgery, in 4 patients the persistence of blood loss and a decrease in hemoglobin less than 8 g/dl was an indication for blood transfusion in the hospital.

After 15 days, the number of patients with bleeding decreased and amounted to 2 in the main group and 10 in the control (OR = 0.150 (95% CI 0.030–0.749)). On the 60th day, blood secretions were retained in 6 patients of the control group, in the main group they were not noted (when assessed using Fisher's test $p<0.05$).

Bleeding in the postoperative period accompanies the inevitable eruption of tissues after the twisting suture, as well as when it comes off after partial resorption. The minimization of thread punctures and

punctures during the submucosal suture application and its implementation outside the intestinal lumen made it possible to avoid this symptom in the main group of patients.

In 6 months after the intervention, the prolapse of internal hemorrhoids was recorded in 23.5% (8 of 34) patients after doppler-controlled desarterization with mucopexy of internal hemorrhoids according to the standard technique and in 5.9% (2 of 34) with the use of the original submucosal suture. Differences in the groups are statistically significant ($p < 0.05$, medium strength).

In 12 months after the operative treatment, the trimmed results were studied in 55 patients (29 of the main and 26 of the control groups). It was noted that, despite the decrease in the number of examined patients, the loss of nodes was also observed in 2 patients of the main group and 8 patients of the control group. The differences were again statistically significant ($p < 0.05$, medium strength).

It should be noted that the degree of node prolapse in the control group repeated intervention in 3 people. The remaining 5 patients in the control group and 2 patients in the main group abstained from repeated intervention, given the minor clinical manifestations of the prolapse of nodes with their independent reduction.

The effectiveness of surgical intervention in terms of recurrent prolapse indicates a more pronounced regression of the cavernous tissue in those operated on in the main group and a lower probability of repeated interventions in order to completely relieve the symptoms of internal hemorrhoids in patients with stage 4 of the disease.

CONCLUSION

The original submucosal suture when performing the RAR procedure in minimally invasive treatment of hemorrhoids is a safe and effective element of surgical intervention in patients even with stage 4 of the disease, which makes it possible to statistically significantly reduce pain and reduce the need for analgesics in the postoperative period. After the application of the submucosal suture, delayed bleeding is not observed and the frequency of relapses in the form of prolapse of internal hemorrhoids is significantly reduced, which makes it possible to recommend it as a routine intervention and an alternative to both traditional hemorrhoidectomy and the standardized HAL-RAR intervention with a coiled mucosal-submucosal suture.

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