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CURRENT VIEWS ON THE STATUS OF VENTRAL HERNIA SURGERY

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Abstract
Abdominal wall hernia repair is one of the most common operations performed by modern surgeons. The management of patients with PVH can be extremely challenging due to a number of factors including obesity, prior hernia repair, previous mesh placement, and other variables. The management of patients with PVH has changed significantly over the past 20 years due to both technological advances and improvements in surgical approaches.Key factors in successful outcome include modification of preoperative risk factors such as smoking cessation and weight loss, selection of mesh appropriate for the type of hernia and planned mesh placement, and wide mesh overlap beyond the edges of the hernia defect.In these patients, new techniques such as transabdominal release and separation of componento.

Keywords Ventral hernias, prosthetic plasty,surgery.

INTRODUCTION

Acute A landmark prospective randomized controlled trial reported by Burger in 2014 evaluated the results of PVH repair with primary sutures and mesh [1].There were 97 patients in the suture group and 84 patients in the mesh group. The recurrence rate after 10 years was 67% in the suture group compared to 32% in the mesh group. The conclusion is that mesh should be used in the vast majority of patients undergoing postoperative hernia plasty today.

Some early data showed that laparoscopic PVH plasty has several disadvantages: longer operative time, costs associated with providing equipment and the use of specialized instruments and mesh. However, further studies proved that in experienced hands, laparoscopic correction takes the same amount of time as open correction. Cost-effectiveness analysis has also shown that the cost of laparoscopic PVG plastic surgery is comparable to open plastic surgery, even without considering patient benefits such as early hospital discharge and early return to work.

Laparoscopic PVG plasty was first described by LeBlanc and Booth in 1993. [7]. They demonstrated the advantage of laparoscopic hernia repair, showing better results and lower complication rates compared to the open method[5]. Currently, only a massive tissue defect with complete loss of abdominal muscular structure is considered unsuitable for laparoscopic access.

Despite improvements in hernioplasty over the past two decades in terms of overall technique, the

results remain unsatisfactory in the opinion of many specialists. Postoperative hernias sutured with primary sutures have recurrence rates ranging from 12% to 54%, whereas the recurrence rate of mesh plasty can be as high as 36%. In addition, the insertion of a foreign body such as prolene mesh can lead to serious adverse effects such as pain, infection, fistula, bowel injury, and bowel adhesions.

Some reports have reported improved outcomes of laparoscopic postoperative hernia repair with a very low recurrence rate of 4.3% and fewer wound complications compared to the open technique. There is insufficient evidence to support the superiority of one plasty technique over the other. It is still unclear whether one plastic technique is superior to another, and it is unknown whether one plastic technique is more appropriate for certain types of hernias than another. Clinical guidelines from the Society for Surgery of the Digestive Tract (SSAT 2018) have shown that hernias less than 3 cm can be repaired first without the use of prosthetic mesh, as well as any hernia that requires extensive tissue dissection, such as component separation. This technique is then suitable for open plasty, but any other types of hernia that do not fall into the above category can be considered for laparoscopic plasty where possible [13]. In addition, the currently available evidence considers the best method of repair with various outcomes such as recurrence rates, associated costs, postoperative complications, and long-term results.

Sajid2019 demonstrated that laparoscopic PVG plasty is an acceptable method of surgical access. The recurrence rate was similar to open technique but with shorter hospital stay and better pain tolerance [9].

Forbes2019, on the other hand, demonstrated that laparoscopic postoperative hernioplasty is not superior to the open technique in terms of hernia recurrence, but this study also included patients with primary hernias. The results showed less wound infection, less bleeding, and an earlier return to work by almost 50%, but laparoscopic repair was associated with a higher rate of bowel injury-2.9% compared- to 0.9% in the open group. Thus, it was concluded that laparoscopic plasty is as safe as open conventional plasty, but open plasty has significant advantages in the form of less damage to the small intestine and seroma formation[11]. Recent studies have shown that laparoscopic hernioplasty is much better than open hernioplasty in terms of short-term outcomes such as blood loss and hospital stay, with earlier return to work, but long-term outcomes remain unchanged. No study has looked at a longer follow-up period after surgery, the follow-up period varied between studies and meta-analyses and mostly covered up to two years after surgery.

To date, there are only a limited number of studies specifically addressing the risks and benefits of laparoscopy in PVG plasty. The first Cochrane review was published in 2011. [8, 12], and this review included 880 patients in the final analysis, with a total of ten studies involved. The review revealed great heterogeneity in the pooled studies as well as problems in eliminating missing results due to heterogeneous studies based on different experiences. Despite the few available randomized controlled trials and retrospective studies, there is a clear lack of data supporting the benefits of one plastic surgery technique over another, and also most of these studies lack unclear long-term outcome data. Long-term outcome was defined by the Cochrane Review as outcome measured after 3 years of follow-up, but there are no studies or trials in this time scale. This is a systematic review with meta-analysis of all randomized controlled trials from January 2016 to the end of December 2019 using the PICO framework. Two different plasty techniques, i.e. standardized laparoscopic and open PVG plasty, were compared and evaluated. Primary outcome included recurrence rate, secondary outcome included incidence of postoperative infections, length of hospital stay and duration of surgery. Five randomized controlled trials met the inclusion criteria and were included in this meta-analysis. All included trials reported patients with PVH (611 patients) who underwent laparoscopic or open plasty. Emergency surgery was excluded from these trials. The duration of follow-up ranged from eight weeks

to 35 months.

There were four outcome variables, two of which were continuous measures (length of hospital stay and time to surgery) and the other two were binary outcomes (recurrence and wound infection). Meta-analysis of continuous outcomes requires data on the mean and standard deviation of the outcome for each study. Some of the five studies provided this information and thus did not pose a problem[6]. Although Asensio (2019) presented the mean and confidence interval, the latter can be easily converted to standard deviation if the number of subjects is known. The first outcome was the duration of surgery[3]. The analysis of the results showed a high degree of heterogeneity between studies ($p<0.001$). Thus, a random effects analysis was performed. This method assumed that the mean time difference between methods (calculated as laparoscopy minus open surgery) was 15 min with 95% CI 0-31 min. This result had borderline statistical significance ($p=0.05$). Nevertheless, three studies seem to demonstrate longer operative times with laparoscopic repair, while Rogmark (2017) found that laparoscopic repair was faster than open repair with a mean difference of 10 minutes, while, on the other hand, Pring (2018) found no difference[10, 2]. The second outcome studied was the duration of the patient's hospital stay. The mean difference between groups was less than one day with a 95% CI of -0.22 to 0.24 days. This difference was not statistically significant ($p=0.92$). Thus, there was no difference in the length of hospital stay between the two surgical techniques.

The occurrence of wound infection was then investigated. There were some differences in outcomes between the studies, but the degree of heterogeneity was not statistically significant ($p=0.12$). The results showed a highly significant difference in outcomes between the two methods ($p<0.001$). The risk of infection was almost five times lower with laparoscopy than with open surgery.

The final outcome of the study was hernia recurrence. The risk ratio (calculated as laparoscopy/open) was 1.29 with a 95% confidence interval of 0.79 to 2.11 and a corresponding p value of 0.30. It is very important to emphasize that the study by Eker (2013) has a weight of more than 50% in this analysis, potentially affecting the results significantly; however, the final analysis showed no significant difference in recurrence rates between the two different methods. Although this meta-analysis showed that the recurrence rate between the two plasty techniques was very similar with a P value of 0.30, several other studies have reported lower hernia recurrence rates with the laparoscopic approach [4]. Nevertheless, with laparoscopic access, unlike open access, it is technically possible to identify all hernia defects, not just the main defect. This allows the use of larger meshes covering all defects, including those that are not clinically or radiologically apparent, which may lead to a reduction in recurrence or even the development of new hernias.

Three RCTs in this study demonstrated significantly longer operative times with laparoscopic access, while one study reported shorter operative times with laparoscopic plasty. On the other hand, Pring 2008 showed no difference in operative time for both laparoscopic and open plasty [3]. Several other studies reported no significant difference in the duration of surgery between the two repair methods, which supports our findings.

Pain control was reported in three trials. While Rogmark (2017) used visual analog assessment, others used the SF-36 quality of life assessment as a tool to measure pain intensity after surgery. Asencio (2009) used another pain measurement tool to assess pain after surgery, namely the EQ5D, although not all studies included the pain scale as an outcome. This heterogeneity was perceived as a limiting factor in the analysis of pain outcomes and was therefore not included in the final analysis [10].

Several studies compared the length of hospital stay and found that laparoscopic reconstruction had a shorter length of hospital stay compared to open plasty. One meta-analysis demonstrated a significant reduction in length of hospital stay in

the laparoscopic group by two days (open surgery by 4 days compared to laparoscopic reconstruction by 2 days), but the authors emphasized that most of their studies were retrospective and only one randomized controlled trial was included.

Finally, this study investigated the incidence of wound infections after surgery. A lower risk of wound infection after laparoscopic surgery was demonstrated with a significant statistical outcome ($p<0.001$) with RR=0.11-0.44 (95% CI), so the probability of wound infection is five times lower when using the laparoscopic option instead of open plasty. Many authors have found fewer complications after laparoscopic repair, resulting in a lower incidence of infection.

Some authors have reported other postoperative complications such as seroma formation, mesh infection, and small bowel injury. The nature of complications differs greatly between the two repair methods: in open surgery, these are mainly complications related to wound and infection, which are generally considered low risk, while complications in laparoscopic repair can be quite serious and life-threatening, including unrecognized damage to the small intestine. No convincing evidence has been found to support one method of plasty. Laparoscopic plasty has been proven to be as effective and safe as open plasty. Conclusions: In summary, the results of the meta-analysis show no differences in length of hospital stay, hernia recurrence rate, and operative time between the two surgical techniques. However, the laparoscopic technique has been shown to be associated with fewer wound infections than open plasty. Multicenter randomized controlled trials should be conducted to achieve a reliable level of evidence that can be used in future meta-analyses. Long follow-up periods to detect hernia recurrence will be required in future studies.

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