Repair Methods in Parastomal Hernia Surgery

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Abstract — Background-Aim: Parastomal hernias (PSH) are incisional hernias that must be classified separately from the other abdominal wall hernias. The high recurrence rate of PSH is the most important problem after suture repair or relocation of the stoma; whereas open or laparoscopic mesh repair results in much lower recurrence rates. The aim of this study is to investigate PSH predisposing factors, surgical repair methods, postoperative complications and recurrence in surgery practice.

Methods: Patient demographics, operation time before the first surgery, operation method, and the recurrence rate seen in patients who underwent PSH surgery in a 10-year time/period (2008-2018) were investigated from the patient records. Except for emergency cases, 2 years of disease-free time was set for PSH surgery in malignant cases to be sure that no malignancy was present in the time of operation.

Results: 14 PSHs were treated surgically using mesh repair in all cases. There were 6 male and 8 female patients with a mean age of 71.7 years (range:45-84;median:78). Open sublay polypropylene mesh placement technique was performed in 12 patients and intraperitoneal composite mesh (using either keyhole or Sugarbaker techniques) was placed laparoscopically in 2 patients. Superficial wound infections were developed in 4 patients (28.5 %) and 2 patients developed recurrence (14.2%).

Conclusion: There is no effective method defined for the surgery of PSH but the laparoscopic approach has been proposed as a promising alternative to open technique as it causes less abdominal wall trauma. Whether performed open or laparoscopic; mesh repair is the optimal standard for PSH surgery.

Index Terms — parastomal hernia, mesh, surgical technique, intraperitoneal repair.

I. INTRODUCTION

Parastomal hernias (PSH) are incisional hernias but they are classified separately [1]. There is insufficient evidence on the policy of watchful waiting, the size of the defect, the route, and the location of stoma construction [1]. PSH incidence tends to increase along with the rising life expectancy after the tumor surgery. PSHs are fascial defects adjacent to the stoma site following ileostomy and colostomy operations [2]. Compared to other types of stomies, end colostomy is associated with a higher PSH incidence [1].

There are many etiologic factors associated with PSH and technical errors, stoma outside the sheath of the rectus abdominis muscle and patient’s predisposing factors (obesity, wound infections, malnutrition, old age, pulmonary diseases, immune status, cancer recurrence) are the most frequent of those [3]. Clinical examination is necessary for PSH diagnosis whereas computed tomography (CT) or ultrasonography may be performed in uncertain cases [1].

The high recurrence rate of PSH is the most important problem after suture repair or relocation of the stoma, whereas open or laparoscopic mesh repair results in much lower recurrence rates. More studies to determine the best repair technique and long term follow-up of the various techniques are needed [4].

In this study, we researched long time results of PSH predisposing factors, operation time after the primer surgery, surgical repair methods, postoperative complications, and the recurrence rate in surgery practice.

II. METHODS

We accessed our hospital database in order to determine the population of this retrospective study and analyzed the PSH cases at our surgical department who underwent PSH surgery between 2008 and 2018. Patient demographics such as age and gender were also recorded in the database. PSH operations due to malignancy, benign conditions, elective and emergent cases were analyzed in the database. Except for emergency cases, 2 years of disease-free time was set for PSH surgery in malignant cases to be sure that no malignancy was present in the time of operation. All eligible patients for the study were reexamined to get accurate and updated data about their physical status. This physical examination was repeated 1 and 12 months after the final surgery to determine the possible morbidities and recurrence. A protrusion in the vicinity of the stoma was considered to be a hernia.

A. Surgical Methods

Open sublay polypropylene mesh placement technique is used in the open surgery group. A circular skin incision is made, and the skin and subcutaneous tissue are excised. An incision is made in the anterior rectus sheath, then the rectus muscle is split and the posterior sheaths along with the peritoneum are incised.

In the laparoscopic surgery group, intraperitoneal on-lay mesh replacement was made available for the patients with PSH. A composite mesh was placed with a composite structure of monofilament polyester textile on one side and a hydrophilic absorbable collagen film on the other side. The main surgical techniques are the keyhole and Sugarbaker techniques in this group.

The keyhole technique involves placing the mesh around the bowel loop. The mesh with the cut opening can be secured by tacks at the beginning. Then, the opposite and remaining

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mesh can be tacked based on the size of the bowel loop.

Plate mesh is used in the Sugarbaker technique. The mesh covers the PSH defect and bowel loop segment that is pushed to the lateral abdominal wall. The mesh over the hernia ring and the mesh periphery are tacked after the procedure.

III. RESULTS

During the 10 years, 14 PSHs (6 male and 8 female patients) were surgically treated in our clinic. Mesh repair was performed in all cases routinely. The mean age of the patients was 71.7 years (range: 45-84; median: 78). PSH was developed after the loop colostomy in 11 patients and following the end colostomy in 3 patients. Patient demographics are presented in Table 1.

| TABLE 1: PATIENT DEMOGRAPHICS |
|-------------------------------|
| **Age (years)** | 71.7 (range, 45-84) |
| **Sex N** | Male 6, Female 8 |
| **Colostomy type N** | Loop Colostomy 11, End Colostomy 3 |
| **Etiology N** | Inflammatory Bowel Disease 1, Familial Polyposis 1, Malignant Tumors 12 |
| **Type of Reconstruction N** | Open Mesh Repair 12, Lap.Intraperitoneal Mesh 2 |
| **Complications N** | Superficial Infection 4, Recurrence 2 |

As the main goal was planning the optimal operation time for PSH, previous operations were also observed. One case was inflammatory bowel disease that was operated emergently, and one was a familial polyposis coli case while the others were malignant tumors.

We have performed open sublay polypropylene mesh placement technique in 12 patients and the intraperitoneal composite mesh was placed in 2 patients. The laparoscopic repair techniques in this group were the keyhole technique in one patient and the Sugarbaker technique in the latter.

For the patients that were operated for malignancy before PSH operation, two years of watchful waiting time interval was determined for safety measurement and no malignancy was present at the time of operation.

At the one-month postoperative follow-up, complications were found in 4 patients (28.5%). All had superficial wound infections and none of them had an intestinal obstruction. There was no major complication in the laparoscopic group. All complications were seen in the open surgery group.

At the one-year postoperative follow-up, 2 patients (14.2%) had developed recurrence which were detected in clinical examination and they were in the open surgery group. CT scans were performed in these patients. Omentum was found in one patient and only a fascial defect was observed in the other. There was no recurrence in the laparoscopic group.

IV. DISCUSSION

The classification systems for PSHs are mostly based on size, location, contents, and radiologic findings associated with the hernia. None of these classification systems are efficient enough to describe the clinical diagnosis or management strategy [5]-[7]. The European Hernia Society had published the guidelines on the prevention and treatment of PSHs lately [1]. In most cases, PSH can successfully be managed with weight loss, patient education, and an ostomy hernia belt [8]. Nevertheless, it is estimated that 30 to 56% of the patients with a parastomal hernia will ultimately require surgical repair [9]. There is no definition for the time of surgery in the literature for elective cases. In malignant cases, after 2 years of follow-up, the surgery is required for the patients with PSH. We did not set a time limitation for surgery in benign cases.

Avoidance from suture repair is strongly recommended in elective PSH surgery [1]. Fascial suture repair and stoma relocation carry high recurrence risks. Relocation of the stoma has high complication (24-88%) and recurrence rates (46-100%) [10]. Mesh repair is considered to be a safe procedure with a low risk of mesh infections and a relatively low recurrence rate up to 28% [11]. In our clinic, we used open or laparoscopic mesh repair. Our recurrence rate was low (14.2%) according to the literature.

Although recent data that suggest sublay mesh replacement at the primary operation is a good way to prevent the development of a hernia; some studies showed similar PSH recurrence rates with and without a prophylactic mesh at the primary operation [12]-[16]. Compared to other types of stomas, end colostomy is associated with a higher incidence of PSH. The use of a prophylactic synthetic non-absorbable mesh upon the construction of an end colostomy is strongly recommended. No such recommendation can be made for other types of stomas at present [1]. We did not use prophylactic meshes in our clinic.

PSH treatment has no well-defined and sufficient comparative data in terms of specific techniques like open or laparoscopic surgery and specific mesh types [1]. We have selected patients with a good general condition for our laparoscopic PSH series due to long operation time and high intraabdominal pressure during the procedure.

We have chosen propylene mesh in open cases because of its low price and accessibility. A whole mesh plate is suggested in preference to a keyhole mesh when the laparoscopic repair is performed. In our series, we used flat composite whole mesh plate in one patient without complication, the keyhole repair was performed in the other. No recurrence or bowel obstruction is seen in these patients. Although the cost is higher, laparoscopically intraperitoneal composite mesh replacement reduces the recurrence risk in PSH repair [17].

V. CONCLUSION

The evidence on the policy of watchful waiting, the route and location of stoma construction, and the size of the defect is/are not sufficient. There is no effective method defined for the surgery of PSH but the laparoscopic approach has been proposed as a promising alternative to open technique as it
causes less abdominal wall trauma. Whether open or laparoscopic; mesh repair is the optimal standard for PSH surgery.

REFERENCES

[1] Antoniou, S.A., Agresta, F., Garcia Alamino, J.M. et al. European Hernia Society guidelines on prevention and treatment of parastomal hernias. Hernia 22, 183–198 (2018). https://doi.org/10.1007/s10029-017-1697-5.

[2] Pilgrim CH, McIntyre R, Bailey M (2010) Prospective audit of parastomal hernia: prevalence and associated comorbidities Dis Colon Rectum 53: 71-76.

[3] Nastro P, Knowles CH, McGrath A (2010) Complications of intestinal stomas Br J Surg 97: 1885-1889.

[4] Husain SG, Cataldo TE (2008) late stomal complications Clin Colon Rectal Surg 21: 31-40.

[5] Cingi A, Cakir T, Sever A, et al. (2006) Enterostomy site hernias a clinical and computerized tomographic evaluation Dis Colon Rectum 49: 1559-1563.

[6] Moreno-Matias J, Serra-Aracil X, Darnell-Martin A (2009) The prevalence of parastomal hernia after formation of an end colostomy A new clinico-radiological classification Colorectal Dis 11: 173-177.

[7] Carne PW, Robertson GM, Frizelle FA (2003) Parastomal hernia Br J Surg 90: 784-793.

[8] Kane M, McErlean D, McGrogan M (2004) Clinical protocols for stoma care 6 Management of parastomal hernia Nurs Stand 18: 43-44.

[9] Heung MT, Chia NH, Chiu WY (2001) Surgical treatment of parastomal hernia complicating sigmoid colostomies Dis Colon Rectum 44: 266-270.

[10] Ldridge AJ, Simson JN (2001) Erosion and perforation of colon by synthetic mesh in a recurrent paracolostomy hernia Hernia 5: 110-111.

[11] Slater NJ, Hansson BM, Buyne OR (2011) Repair of parastomal hernias with biologic grafts: a systematic review J Gastrointest Surg 15: 1252-1258.

[12] A. Janes, Y. Cengiz, and L. A. Israelsson, “Preventing parastomal hernia with a prosthetic mesh: a 5-year follow-up of a randomized study,” World Journal of Surgery, vol. 33, no. 1, pp. 118–121, 2009.

[13] S. P. Wijeyekoon, K. Gurusamy, K. El-Gendi, and C. L. Chan, “Prevention of parastomal herniation with biologic/composite prosthetic mesh: a systematic review and meta-analysis of randomized controlled trials,” Journal of the American College of Surgeons, vol. 211, no. 5, pp. 637–645, 2010.

[14] M. Lopez-Cano, R. Lozoya-Trujillo, S. Quiroga et al., “Use of a prosthetic mesh to prevent parastomal hernia during laparoscopic abdominoperineal resection: a randomized controlled trial,” Hernia, vol. 16, no. 6, pp. 661–667, 2012.

[15] J. Shabbir, B. N. Chaudhary, and R. Dawson, “A systematic review on the use of prophylactic mesh during primary stoma formation to prevent parastomal hernia formation,” Colorectal Disease, vol. 14, no. 8, pp. 931–936, 2012.

[16] M. Nikberg, I. Sverrisson, K. Tsimogiannis, A. Chabok, and K. Smedh, “Prophylactic stoma mesh did not prevent parastomal hernias,” International Journal of Colorectal Disease, vol. 30, no. 9, pp. 1217–1222, 2015.

[17] Näsvall P, Rutegård J, Dahlberg M, Gunnarsson U, Strigård K. Parastomal Hernia Repair with Intraperitoneal Mesh. Surg Res Pract. 2017; 2017:8997463. doi:10.1155/2017/8997463.