

# Laparoscopic Mesh Repair of Parastomal Hernia. Is It a Sufficient and Free of Complication Technique? A Case Presentation and Review of the Literature

**Sfoungaristos S.<sup>1</sup>, Alexiadis G.<sup>2</sup>, Mpolkas V.<sup>2</sup>, Doulaptsi M.<sup>2</sup>,  
Koutsopoulos K.<sup>2</sup>**

<sup>1</sup>Department of Urology, University Hospital of Patras, Patras, Greece;

<sup>2</sup>Department of Surgery, General Hospital of Rhodes, Rhodes, Greece

Received April 28, 2011; Accepted September 26, 2011.

**Key words:** Parastomal hernia – Mesh repair – Laparoscopic treatment

**Abstract:** Parastomal hernia is a complication of stoma formation. It is accompanied by high morbidity. It affects stoma's function and patient's quality of life. There several alternative treatment options including stoma relocation, primary prophylactic repair during the stoma construction and open or laparoscopic mesh repair. We describe the case of a young woman with Crohn's disease that presented a parastomal hernia at the site of an ileostomy. We performed a laparoscopic mesh placement and repair of the hernia. After 28 months of follow-up, the patient remains complications and recurrence-free. The laparoscopic mesh repair is a challenging way to treat parastomal hernias. In the studies have been done so far comparing this approach with the other alternative treatments, the laparoscopic way seems to offer remarkable therapeutic results with minor complication and recurrence rates. Our department's experience is suggesting that laparoscopic repair is an effective and sufficient treatment option.

**Mailing Address:** Stavros Sfoungaristos, MD., Department of Urology, University Hospital of Patras, Building A, 4<sup>th</sup> Floor, Rion, 26500 Patras, Greece; Phone: +302 610 999 367; Fax: +302 610 993 981; e-mail: sfoungaristosst@gmail.com

## Introduction

Parastomal hernia is a category of uncommon abdominal wall hernias and constitutes a common complication of stoma formation (Pearl, 1989). Furthermore, the existence of some degree parastomal hernia is inevitable after stoma's construction. Many of these hernias remain asymptomatic. However, they can produce several complications, gradating of local irritative symptoms and pain to life-threatening situations like perforation, obstruction and intussusception. Parastomal hernia incidence is in direct relation with patient follow-up and hernia's type (Londono-Schimmer et al., 1994). The incidence of end colostomies hernias varies between 4–50% (Pearl, 1989; Stelzner et al., 2004) while in loop colostomies is 0–30.8% (Carne et al., 2003). Most of them are revealed in the first years after the stoma construction, however late formation, even after 20 years, has been reported (Londono-Schimmer et al., 1994).

The mesh repair of parastomal hernias has shown mixed results. The intra-peritoneal mesh placement presents low recurrence rate but serious complications like intestine obstruction because of extensive formation of adhesions (Byers et al., 1992; Morris-Stiff and Hughes, 1998; Aldridge and Simson, 2001). The placement of the mesh at the posterior surface of the anterior abdominal wall presents two main advantages. Firstly, the direct contact of the mesh and the intestinal loops is avoided, deterring the adhesion formation and secondly the intra-abdominal pressure is keeping the mesh at place increasing its effectiveness (Schumpelick et al., 1999).

## Case presentation

A 39-years-old female patient, suffering from mental retardation and Crohn's disease, presented in our hospital because of acute abdominal pain and after clinical and radiographic evaluation she was diagnosed with small intestine obstruction and finally operated. Intraoperatively, 30 cm of necrotic ileum tissue was resected and ileostomy at the left lateral abdominal wall was formatted. Patient was discharged at the 8<sup>th</sup> postoperative day.

Two months later, a parastomal hernia occurred. The patient started to suffer by local irritating problems, pain in the region of stoma and diffuse abdominal pain.

In July 2008, 2 years after the last operation, she entered in B' Surgery Department of our hospital to undergo laparoscopic mesh repair of the parastomal hernia. A computer tomography scan of upper and lower abdomen with oral contrast use was performed which did not detect any anatomic abnormality or any lesion, contraindicating the operation.

During the operation, the part of ileus, used for the ileostomy formation, was released from the abdominal wall (Figure 1).

While patient was placed in supine position, pneumoperitoneum was accomplished by supraumbilical placement of a Veress needle. Two 10/5 mm trockars were placed; the first at the middle line supraumbilical and the second at the

right abdominal region. Another 5 mm trockar was placed on the right abdomen (Figure 2). Lysis of the adhesions performed and after this the mesh was inserted through the stomia and placed intraabdominally.

We used duplex monoclonic elastic mesh. The inferior side (polyvinylidene fluoride) prevents the formation of adhesions with the underlying loops while the superior side (polypropylene) assists the integration of the mesh with the overlying peritoneum. Additional features include sizeable pores to ensure maximum intraoperative transparency and permeability in the case of postoperative hematoma or lymphocele. It is characterized by longitudinal and transverse elasticity which provides rapid postoperative recovery and reduced postoperative pain.

After we checked the uniform and tense free placement of the mesh around the stomia, fitting of the mesh at the inner surface of the peritoneum with auto-sutures was performed successfully (Figure 3). The proximal part of the ileum was placed again at the left lateral abdominal wall and an ileostomy was recreated (Figure 4). A drain was placed in the right abdominal region which was removed at



Figure 1 – Preparation of the ileostomy.



Figure 2 – Trockars location.

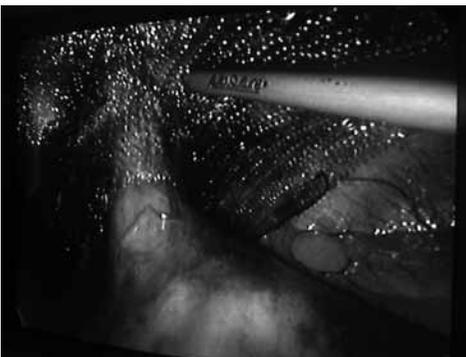


Figure 3 – Suturing the mesh at the inner surface of the peritoneum.



Figure 4 – The final repair of the hernia and the location of the mesh.

the 3<sup>rd</sup> postoperative day. Duration of operation was 1 h and 40 min and no blood transfusion, intra or post-operatively, needed.

No post-operative complications appeared. She was mobilized the 1<sup>st</sup> post-operative day and was discharged the 10<sup>th</sup> post-operative day. The patient, more than 2 years after surgery, is healthy with no recurrence or complications related to the operation, stoma or mesh.

## Discussion

Parastomal hernias constitute a common complication following stoma formation and represent a treatment dilemma for the patient and surgeon.

There are several alternative therapeutical approaches. Primary prophylactic repair during the stoma construction is a simple method with minor morbidity and requires no laparotomy. However, the overall results are disappointing because of recurrence rate that reach 100% (46–100%) (Horgan and Hughes, 1986; Allen-Mersh and Thomson, 1988; Rubin et al., 1994).

Stoma relocation is another surgical approach. It may result in a zero recurrence rate at the same hernia site, but the risk of a parastomal hernia after new stoma formation is still expected. In addition, an incisional hernia at the previous stoma site closure may also occur (Hiranyakas and Ho, 2010). Rubin et al. (1994) reported that stoma relocation is superior to fascial repair, for first-time parastomal hernia repairs. Parastomal hernia recurrence developed in 22 (76%) of 29 patients who had fascial repair but in only 6 (33%) of 18 patients who had stoma relocation. When repair was undertaken for recurrent parastomal hernia, fascial repair was failed in all 7 cases and stoma relocation failed in 5 (71%) of 7 cases. Complications were more common following stoma relocation (88%) than following fascial repair (50%). In particular, incisional hernias developed in 52% of patients following stoma relocation but in only 3% of patients following fascial repair. When postoperative occurrence of all abdominal-wall hernias was compared, there was no significant difference between the fascial repair group (81% of 36 repairs) and the stoma relocation group (68% of 25 repairs).

Sugarbaker (1980) was the first who described the mesh repair of a parastomal hernia. He used an open surgical method at the site of the old abdominal incision, which reopened and prosthetic mesh sutured in place aseptically. The colon was led off and secured to the lateral part of the abdominal wall creating a flap valve that makes recurrence unlikely. In the 6 studied patients, no recurrences or complications related to the mesh occurred after 4–7 years of follow-up. Interestingly, in another case series of 7 patients operated for parastomal hernia repair with polypropylene mesh, remarkable mesh related complications were reported after a mean follow-up of 81 months (Morris-Stiff and Hughes, 1998). In a retrospective analysis of 58 patients underwent parastomal hernia repair with polypropylene mesh, and a mean follow-up of 50.6 months the overall complications related to the mesh was 36% (recurrence 26%, surgical bowel

obstruction 9%, prolapse 3%, wound infection 3%, fistula 3%, and mesh erosion 2%) (Steele et al., 2003). Complications were significantly associated with younger age, while cancer patients with stomas had fewer complications. Inflammatory bowel disease, stoma type (end colostomy, end ileostomy, loop transverse colostomy), mesh location, urgent procedures, steroid use, and surgical approaches were not significantly associated with an increased complication rate.

The laparoscopic approach is the most promising way of treating hernias. In a large study of 850 patients with ventral hernia treated by laparoscopic repair, after a mean follow-up time of 20.2 months, the hernia recurrence rate was 4.7% (Heniford et al., 2003). Recurrence was associated with large defects, obesity, previous open repairs, and perioperative complications. Published series on laparoscopic mesh repair of parastomal hernia are few with relative short follow-up. In a recent prospective study of 72 consecutive patients with parastomal hernias (48 paracolostomy and 24 paraileostomy) treated with laparoscopic approach and a mean follow-up of 3 years, the recurrence rate was less than 10% (Wara and Andersen, 2011). The median hospital stay was 3 days. Postoperative complications were observed in 16 patients (22%) while late mesh-related complications were observed in 5 patients (7%). A retrospective chart review was performed in 25 patients with parastomal hernia who underwent laparoscopic or open repair in 7 years time (Pastor et al., 2009). Laparoscopic repair was attempted on 12 patients and 13 patients underwent open repair. Mean operative time was 172 minutes for laparoscopic and 137 minutes for open cases while mean hospital stay was 3.1 days (laparoscopic) and 5.1 days (open). Immediate postoperative complications and recurrence rate were 33.3% and 33.3% (laparoscopic) and 15.4% and 53.8% (open), respectively. Several other studies are reporting promising results after laparoscopic repair of parastomal hernias. However, larger studies are required to prove the efficacy and safety of this approach and to export safe results.

## Conclusion

In our centre the first laparoscopic repair of parastomal hernia with polypropylene mesh was successfully completed. Based on our experience, this treatment approach is sufficient and effective. The fact that the patient, after more than 2 years of follow-up, remains free of complications and recurrence, prompts us to report that the laparoscopic way to treat parastomal hernias is a reliable therapeutic option. However, if this is the gold standard to treat such cases remains to be confirmed.

## References

- Aldridge, A. J., Simson, J. N. (2001) Erosion and perforation of colon by synthetic mesh in a recurrent paracolostomy hernia. *Hernia* **5**, 110–112.
- Allen-Mersh, T. G., Thomson, J. P. (1988) Surgical treatment of colostomy complications. *Br. J. Surg.* **75**, 416–418.

- Byers, J. M., Steinberg, J. B., Postier, R. G. (1992) Repair of parastomal hernias using polypropylene mesh. *Arch. Surg.* **127**, 1246–1247.
- Carne, P.W., Robertson, G. M., Frizelle, F.A. (2003) Parastomal hernia. *Br. J. Surg.* **90**, 784–793.
- Heniford, B. T., Park, A., Ramshaw, B. J., Voeller, G. (2003) Laparoscopic repair of ventral hernias: Nine years' experience with 850 consecutive hernias. *Ann. Surg.* **238**, 391–399.
- Hiranyakas, A., Ho, Y. H. (2010) Laparoscopic parastomal hernia repair. *Dis. Colon Rectum* **53**, 1334–1336.
- Horgan, K., Hughes, L. E. (1986) Para-ileostomy hernia: failure of a local repair technique. *Br. J. Surg.* **73**, 439–440.
- Londono-Schimmer, E. E., Leong, A. P., Phillips, R. K. (1994) Life table analysis of stomal complications following colostomy. *Dis. Colon Rectum* **37**, 916–920.
- Morris-Stiff, G., Hughes, L. E. (1998) The continuing challenge of parastomal hernia: Failure of a novel polypropylene mesh repair. *Ann. R. Coll. Surg. Engl.* **80**, 184–187.
- Pastor, D. M., Pauli, E. M., Koltun, W. A., Haluck, R. S., Shope, T. R., Poritz, L. S. (2009) Parastomal hernia repair: a single center experience. *JSLs* **13**, 170–175.
- Pearl, R. K. (1989) Parastomal hernias. *World J. Surg.* **13**, 569–572.
- Rubin, M. S., Schoetz, D. J. Jr., Matthews, J. B. (1994) Parastomal hernia. Is stoma relocation superior to fascial repair? *Arch. Surg.* **129**, 413–418.
- Schumpelick, V., Klinge, U., Welty, G., Klosterhalfen, B. (1999) Meshes within the abdominal wall. *Chirurg* **70**, 876–887. (in German)
- Steele, S. R., Lee, P., Martin, M. J., Mullenix, P. S., Sullivan, E. S. (2003) Is parastomal hernia repair with polypropylene mesh safe? *Am. J. Surg.* **185**, 436–440.
- Stelzner, S., Hellmich, G., Ludwig, K. (2004) Repair of paracolostomy hernias with a prosthetic mesh in the intraperitoneal onlay position: modified Sugarbaker technique. *Dis. Colon Rectum* **47**, 185–191.
- Sugarbaker, P. H. (1980) Prosthetic mesh repair of large hernias at the site of colonic stomas. *Surg. Gynecol. Obstet.* **150**, 576–578.
- Wara, P., Andersen, L. M. (2011) Long-term follow-up of laparoscopic repair of parastomal hernia using a bilayer mesh with a slit. *Surg. Endosc.* **25**, 526–530.