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Original Research

The use of a composite synthetic mesh in the vicinity of bowel - For repair and prophylaxis of parastomal hernias. Does it increase the risk of short term infective complications?

Zhaowei Zhou, Amarvir Bilkhu, Suhail Anwar*

Department of Colorectal Surgery, Calderdale and Huddersfield NHS Trust, Huddersfield, UK

HIGHLIGHTS

- Parastomal hernias remains a cause of significant morbidity.
- Laparoscopic repair of parastomal hernias reduces the risk of recurrence as compared to open surgery.
- The use of composite mesh remains controversial in the repair of parastomal hernias mainly due to risk of infection.
- Prophylactic repair of parastomal hernia is an upcoming and very promising technique for prevention of parastomal hernias.
- Our experience with the use of a composite mesh both for repair and prophylaxis of parstomal hernias shows minimal risk of infection.

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ABSTRACT

Aims: The use of synthetic meshes in potentially infected operative fields such as in the vicinity of large bowel, is controversial. This study describes our experience with the use of a synthetic composite mesh for prophylaxis and repair of parastomal hernias.

Methods: Data were collected retrospectively over a 7-year period from 2008 to 2015. An IPOM (DynaMesh™) was used either during the formation of the stoma to reinforce the abdominal wall around the stoma or during the surgical repair of existing parastomal hernias, using keyhole or sandwich technique. Majority of meshes were placed laparoscopically. Clinical data and outcomes any stoma wound complications were collected.

Results: Forty seven patients were included with a male to female ratio of 34:13. Median age was 66 years (38–91 years) with median follow-up of 17 months (3–73 months). Twenty seven patients had a prophylactic mesh placement (PMP) around colostomy after resection of colorectal cancer. None of these patients had any wound complications. Twenty patients had repair of parastomal hernias (RPH). One patient (1/20) in this group had a superficial wound infection around the stoma site and underwent an incision and drainage. One patient developed seroma and one had parastomal wound haematoma.

Conclusions: The use of a composite synthetic mesh using a laparoscopic IPOM technique for the prophylaxis and treatment of parastomal hernias, even in a clean contaminated surgical field, is safe and feasible.

1. Introduction

Parastomal hernias are frequent and troublesome complications of stoma formation, with an incidence reported to be as high as 50% [1–3]. As well as being unsightly and uncomfortable, they can cause a significant impact upon a patient's daily activities, body self-image and psychology. There is a risk of acute bowel incarceration, obstruction and subsequent morbidity and mortality. Approximately a third of patients with parastomal hernias will eventually require surgery [2,4,5].

Various surgical techniques have been described to repair parastomal hernias [6–10]. Three commonly used open techniques are primary suture repair, repair with a prosthetic mesh and re-siting of

* Corresponding author. Calderdale and Huddersfield NHS Trust, Huddersfield Royal Infirmary, Lindley, Huddersfield HD3 3EA, UK.
E-mail address: suhail@keyholesurgeon.co (S. Anwar).

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the stoma. Studies have shown superiority of mesh repair in terms of low recurrence [11–15] with both open or laparoscopic techniques. However even laparoscopic mesh parastomal hernia repair has been shown to have recurrence rates of between 20% and 30% [16]. Recently there has been a shift in prevention of parastomal herniation with a prosthetic mesh at the time of stoma creation [17–20]. Although still not widely accepted this technique is gaining popularity with good long term results.

One of a significant concern both for repair and prophylaxis of parastomal hernias is the use of a synthetic mesh in a clean-contaminated or contaminated field. Earlier reports quoted a high risk of wound complications between 15 and 30% [21]. The current evidence has largely been based on observational studies and there remains a divide in surgeons' attitudes towards the use of mesh in stoma operations and concern regarding the proximity of the mesh during stoma formation. Furthermore, opinion is divided regards the optimal level of mesh placement (intraperitoneal, open sublay, inlay or onlay techniques) and the type of mesh used (Polypropylene, PTFE, composite and biological meshes). The laparoscopic intraperitoneal onlay mesh repair (IPOM) technique has been shown to be superior to open techniques in terms of low infection rates [22,23].

In this retrospective study, we reported a single surgeon's clinical outcomes of using laparoscopic IPOM technique with composite synthetic mesh (DynaMesh) in the prophylaxis and repair of parastomal hernias. Dynamesh is approved for IPOM use in abdominal wall incisional hernias. They specifically make a product called IPST mesh for parastomal hernia (Fig. 1).

2. Methods

Data was collected retrospectively for all laparoscopic parastomal hernia surgery using DynaMesh over a 7 years' period from 1st July 2008 to 31st December 2015.

The mesh used was a composite synthetic open-pore mesh consisting of a dual layer-a parietal side made of Polyproylene (12%) and a visceral layer of Polyvinylidene fluoride (PVDF) (88%) (DynaMesh-IPOM, FEG-Textiltechnik, Aachen, Germany). The PVDF on the visceral side is designed to retain its low adhesive property and the polypropylene on the parietal side provides effective incorporation into the abdominal wall. Three different mesh configurations were used: keyhole technique, sandwich technique or use of the DynaMesh-IPST mesh product. Both groups were consented for the procedures in an appropriate fashion.

Primary outcomes were the post-operative parastomal/abdominal wall wound infection. Secondary outcomes were parastomal seroma and haematoma formation, hernia recurrence and 30-day mortality.

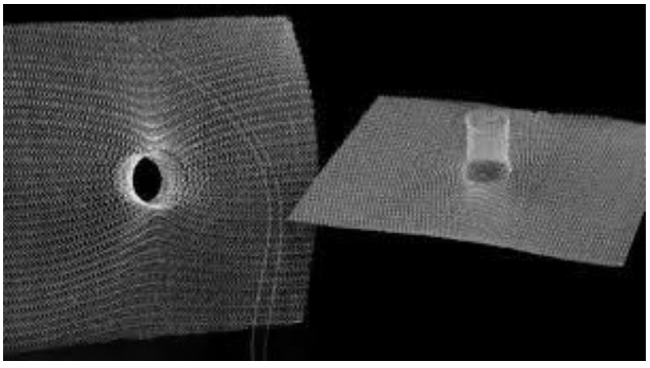

Fig. 1. Dynamesh IPST.

The wound infection is defined as any purulent drainage, erythema, or induration at the wound, or when extra care is needed to nurse the wound, including packing, dressings, or antibiotics.

3. Surgical procedure

All procedures were carried out laparoscopically. All patients were given a single dose of pre-operative and two doses of post-operative intravenous antibiotics Gentamicin (Sanofi UK) and metronidazole (Baxters UK) on induction followed by either co-amoxiclav (Wockhardt UK) or cefuroxime (Flynnpharma Dublin) and metronidazole if allergic to penicillin.

In the prophylactic group, after colorectal cancer resection (either Abdomino-perineal excisions or Hartmann's procedures) the colostomy was exteriorized in the usual fashion. A 15*15 cm DynaMesh IPOM was used with a slit fashioned in the middle by the operating surgeon. The mesh was inserted laparoscopically and placed around the stoma (keyhole technique). An overlap was achieved between the two limbs of the mesh to fit snugly around the stoma but not tight enough to cause strangulation. The mesh was fixed with AbsorbaTack 5 mm absorbable fixation device (Covidien US).

In the repair group the initial access was gained via a visiport and meticulous adhenolysis was carried out. The hernia contents were reduced making sure not to jeopardize the blood supply to the stoma. The stoma defect was delineated. A 15*15 cm DynaMesh was placed using the keyhole technique; then a second larger piece of mesh (20*30 cm or 30*30 cm DynaMesh) was placed to lateralize the stoma (Sandwich technique) The mesh size was chosen with a minimum overlap of 5 cm around the hernia defect. The larger size of the second mesh also allowed the mesh to cross over onto the other side of the anterior abdominal wall thus repairing or preventing any midline incisional hernia. The mesh was fixed around the stoma onto the abdominal wall with the use of AbsorbaTack.

DynaMesh-IPST mesh product was also used in some patients in the repair group. It is a ready-made circular mesh with a sleeve in the centre for the stomal loop. It was placed and anchored around the stoma in the same fashion as the keyhole technique.

4. Data collection

Patients identified as having a prophylactic parastomal mesh placement or laparoscopic mesh parastomal hernia repair were deemed eligible for the study. The medical notes were reviewed and data on demographics, co-morbidities, indication, operative procedure, length of hospital stay, readmission rates and outpatient follow-ups were collected. The aim was to follow patients up at 3 months, 6 months, one year then annually post operation for up to 5 years in all cancer cases. Due to financial constraints in current NHS, it is not possible to follow up benign diseases after they have recovered from their surgery, hence the follow-up regime varied.

5. Results

Between 1st July 2008 and 31st December 2015, 47 patients underwent parastomal hernia surgery using DynaMesh.

Twenty patients had a repair of an existing parastomal hernia (RPH group). Patient demographics were shown in Table 1. Five patients had mesh placed using the keyhole technique, 13 using the sandwich technique and 2 patients had the IPST mesh product. The choice of procedure was dependent upon our experience with the sandwich technique which is now our treatment of choice. The keyhole and IPST although technically less challenging are only suitable for smaller hernial defects (Table 2).

One patient developed parastomal wound abscess needing local