CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 41 (2017) 107–109

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Use of biologic mesh at ostomy takedown to prevent incisional hernia: A case series

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ARTICLE INFO

Article history:
Received 17 July 2017
Received in revised form 3 October 2017
Accepted 4 October 2017
Available online 6 October 2017

Keywords:
Biologic mesh
Ostomy takedown
Stoma reversal
Incisional hernia
Parastomal hernia
Hernia prophylaxis

ABSTRACT

INTRODUCTION: Incisional hernias are a relatively common occurrence after ostomy takedown with a incidence of 30–35%. The use of biologic mesh offers a means to bolster the stoma incision site with a lower risk of infection than synthetic mesh.
METHODS: This study represents a retrospective chart review of six patients who underwent stoma takedown and had biologic mesh placed in the retrorectus position during repair from March 2015 until March 2016.
RESULTS: There has been a zero-rate of hernia occurrence for the six patients who underwent stoma takedown. No incisional hernias were noted on physical exam with follow up ranging from 11 to 25 months.
CONCLUSION: We conclude that placement of biologic mesh is a safe and effective way of preventing incisional hernias at stoma sites.
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1. Introduction

Over 1 million abdominal wall herniorrhaphies are performed in the United States each year. Approximately 100,000 of these are incisional hernias. This surgical complication places a strain on the healthcare system economically and decreases quality of life for patients who develop these hernias. In this study we aimed to see if there was a way to decrease the incidence of incisional hernia with minimal added morbidity to patients. The feasibility of using biologic mesh in infected fields has been demonstrated in the literature. We believe that the use of biologic mesh at time of colostomy and ileostomy reversal is an effective and safe way to reduce the incidence of incisional hernia. This work has been reported in line with the PROCESS and SCARE criteria [1,2].

2. Patients and methods

This study is a retrospective case series performed by a single center community hospital in which all cases were consecutive. All patients undergoing stoma takedown from 2015 to 2016 were included in the study. The patient demographic included those that required colonic resection and ostomy formation for diverticulitis or colon cancer. The rate of incisional hernia formation after ostomy takedown noted on physical exam was recorded with follow up ranging from 11 to 25 months. All patients underwent stoma reversal with placement of biologic mesh (GORE® Bio-A®) in the retrorectus position. The procedure was performed by a single surgical oncologist, which minimized inter or intra-operator variation, and ensured quality and consistency of the procedure.

3. Results

3.1. Case 1

This is a 64 year-old female who underwent laparoscopic diverting loop sigmoid colostomy for an obstructive rectal sigmoid mass. After subsequent diagnosis of rectal cancer, she returned to the operating room for a low anterior resection and loop ileostomy. At this time she had a colostomy takedown, parastomal hernia repair and biologic mesh was placed retrorectus to close the fascial defect at the former colostomy site. Nine months following the original procedure, she was taken to the operating room for ileostomy closure and stomal site hernia repair with biologic mesh. She was found to have a parastomal hernia at the loop ileostomy site during this procedure. At her last follow up, 25 and 20 months following her loop colostomy and loop ileostomy takedowns, she has not developed new hernias or surgical site infection at the sites where biologic mesh were placed. Her risk factors prior to surgery was that she is a former smoker.

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https://doi.org/10.1016/j.ijscr.2017.10.002
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3.2. Case 2

This is a 61 year-old male who was status post Hartmann's procedure for perforated diverticulitis that underwent laparoscopic Hartmann reversal 8 months later. This included takedown of the end colostomy and placement of biologic mesh in retrorectus fashion to close the fascial defect at the former ostomy site. Eleven months post surgery he had not developed new hernias or surgical site infection at the former ostomy site where biologic mesh was placed. His risk factors prior surgery included former smoker.

3.3. Case 3

This is a 66 year-old male who was status post Hartmann's procedure for complicated diverticulitis that underwent Hartmann reversal 18 months following his original procedure. This included takedown of the end colostomy and placement of biologic mesh in retrorectus fashion to close the fascial defect at the former ostomy site. At time of ostomy reversal this patient was found to have a parastomal hernia. Twenty-two months post surgery he has not developed new hernias or surgical site infection at the former ostomy site where biologic mesh was placed. His risk factors prior surgery included history of hypertension.

3.4. Case 4

This is a 55 year-old female with history of COPD and former smoker who underwent left colectomy with end transverse colectomy for a near obstructing metastatic colon cancer of the splenic flexure. Nine months later she returned to the operating room for reversal of colostomy and colon resection. This included takedown of the end colostomy and placement of biologic mesh in retrorectus fashion to close the fascial defect at the former ostomy site. This patient also had a parastomal hernia at time of ostomy reversal. Twenty-four months post surgery she has not developed new hernias or surgical site infection at the former ostomy site where biologic mesh was placed.

3.5. Case 5

This is a 67 year-old female with history of type 2 diabetes, hypertension and former smoker who underwent sigmoid colectomy with loop ileostomy for a sigmoid colon cancer. Two months later she returned to the operating room for reversal of ileostomy and placement of biologic mesh. This included takedown of the diverting loop ileostomy and placement of biologic mesh in retrorectus fashion to close the fascial defect at the former ostomy site. Eighteen months post surgery she has not developed new hernias or surgical site infection at the former ostomy site where biologic mesh was placed.

3.6. Case 6

This is a 55 year-old female with a history of colon cancer, which he underwent abdominal peritoneal resection for. He later developed an anastomotic leak and was taken back to the OR for diverting loop ileostomy. Four months later he returned to the operating room for reversal of the loop ileostomy and placement of biologic mesh. This included takedown of the loop ileostomy and placement of biologic mesh in retrorectus fashion to close the fascial defect at the former ostomy site. Sixteen months post surgery he has not developed new hernias or surgical site infection at the former ostomy site where biologic mesh was placed.

4. Discussion

The incidence of incisional hernia after stoma reversal has been recently defined as a result of multiple systematic reviews studying this complication. Analysis of studies with the least bias suggest the clinical and radiographic incidence rate of incisional hernia after ostomy takedown is approximately 30% and 35%, respectively [3,4]. Interestingly, the rates of incisional hernia repair may be even higher due to patients lost to follow up, and rate of hernia formation not being a primary endpoint of study. A study at a single institution showed the median time to hernia formation as 32 months [5]. Morbidity following all hernias includes pain, deformity, and obstruction [4]. These types of complications tend to require urgent repair.

Several risk factors have been proposed for the development of incisional hernia secondary to stoma takedown. Risk factors that were common to all studies that analyzed this data were the presence of type 2 diabetes mellitus (DM II) and arterial hypertension (HTN) [4,5]. A study at a single institution also included BMI >30 and urgent operation as risk factors [5]. Another consistent theme was that colostomy – end or loop – tended to have higher rates of incisional hernia formation than ileostomy after takedown [4,5,7]. Reason for these findings have not been proposed and warrant further study.

Historically, the use of prosthetic mesh has been avoided at wound sites that are contaminated, or when surgery involves the open gastrointestinal tract. Although, there have been multiple studies that confirm safety in using prosthetic mesh on prepared intestine as a prophylaxis against parastomal hernia formation when placed at the time of stoma formation [6,7]. There is one study that showed the use of a polyester mesh that was placed at the time of ostomy formation in ten patients to be successful in preventing hernia formation after takedown, with a two year follow up [7]. Studies showing the use of biologic mesh, which has been shown to be safe for the use in contaminated wounds, have yet to be established. Our study includes six cases in which biologic mesh (GORE® Bio-A®) has been used at the time of ostomy takedown as prophylaxis against incisional hernia at the stomal site. Thus far, there have been no cases of incisional hernia. This suggests that there is an alternative option to the current standard of practice, which is primary closure at the time of ostomy takedown. However, we acknowledge that this is a case series and would benefit from a larger randomized control trial.

5. Conclusion

Use of biologic mesh at time of ostomy reversal is a safe and effective way to possibly reduce the incidence of incisional hernia after ostomy takedown. In our series there were no instances of surgical site infection or incisional hernia formation post-op. Further research is needed to assess its impact on hernia incidence in a large randomized study.

Conflicts of interest

There are no conflicts of interest to report.

Funding

There are no study sponsors.

Ethical approval

The Jewish Hospital Intitutional review board reviewed the protocol and approved/waived ICF (Retrospective chart review) on October 25th 2016.

IRB 00000127/FWA 00002824.

Consent

Written and signed consent was waived for this case series and approved by the institutional review board. A copy of the IRB approval form is available for review upon request.

Author contribution

Sepehr Lalezari contributed to the intellectual process, drafting and editing of the manuscript. Michael L Caparelli contributed to the drafting, editing and intellectual aspect of the manuscript. Shyam Allamaneni is the principal investigator of the paper and contributed to the procedural, intellectual, and editing aspects of the manuscript.

Registration of research studies

Registry of systematic reviews/meta-analyses.
researchregistry2343.

Guarantor

Sepehr Lalezari MD, Michael Caparelli MD, Shyam Allamaneni MD.

Acknowledgement

Thank you to our colleagues, friends and family who encourage and support us in our work.

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