Unraveling the Enigma of Parastomal Hernias: Exploring Risk Factors, Timelines, and Preventive Strategies After Stoma Reversal

Steven Y. Xu[1], Jessica Zhou, MS[1], Brianne E. Sherman[1,2], Carrie Y. Peterson, MD[1,2], Matthew I. Goldblatt, MD[1,2]

[1]Medical College of Wisconsin, [2]Department or Surgery, Medical College of Wisconsin

INTRODUCTION

- Incisional hernia is a common complication after ostomy stoma reversal, with variable reported incidence up to 50%[1, 2]
- Current literature suggests that incisional hernias may be underreported[3]
- Due to the difficulty in making risk-benefit analyses, it is not currently common for surgeons to include incisional hernia prevention measures during stoma reversal
- This study aims to identify risk factors and diagnostic timeline of incisional hernia to aid surgeons' clinical decision-making

METHODS

- Retrospective chart review was conducted on 370 patients who underwent ostomy reversal at Froedtert Hospital, Milwaukee WI between 1/1/2016 and 12/31/2021
- Exclusion: Age < 18 at time of surgery, death immediately after surgery, or if an ostomy is still present
- ⇒ **340** cases were eventually included
- Logistic regression and Kaplan-Meier fit were used to identify risk factors and analyze incidence patterns

*Patients who had both ileostomy and colostomy, or both loop and end ostomy, were not considered when analyzing the effect of type of ostomy

RESULTS

- The overall rate of parastomal/incisional hernia occurrence over the entire course of ostomy treatment was:

  38.8 % (n = 132)

- The occurrence rate after surgical reversal of ostomy was:

  24.4% (n = 83)

- Significant risk factors identified with multivariable regression include **obesity** (BMI>30), **ileostomy** (v. colostomy) and **hernia noticed before ostomy reversal (parastomal hernia, PSH)**
- In addition, **history of T2DM**, **HTN**, and **ostomy created due to rectal trauma** were univariately significant

Table 1. Risk factors of hernia after ostomy reversal

	Hernia Rate	Odds Ratio (95% confidence)	*p* (univariate)
Obesity			
No	16.6%	3.625	<0.001***
Yes	41.9%	(2.159, 6.086)	
Ostomy Type			
Colostomy	18.6%	1.537	0.147
Ileostomy	26.0%	(0.858, 2.753)	
Parastomal Hernia			
No	14.4%	5.822	<0.001***
Yes	49.5%	(3.408, 9.944)	
Diabetes			
No	22.1%	2.265	0.0175*
Yes	39.1%	(1.179, 4.352)	
Hypertension			
No	18.8%	2.214	0.0021**
Yes	33.9%	(1.338, 3.662)	
Ostomy due to Trauma			
Non-Trauma	26.0%	0.295	0.0303*
Trauma Case	9.38%	(0.087, 0.994)	

- BMI alone can serve as a hernia indicator, showing a significant association ($p < 0.001$)

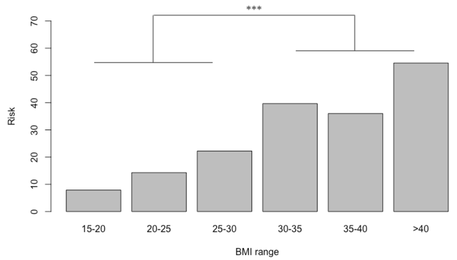


Figure 1. Hernia risk in different BMI intervals

- Variables that did not reach statistical significance: Gender, recent steroid usage, biologics usage, history of chemotherapy, radiation therapy, previous ostomy history, previous hernia history, smoking status, loop v end type ostomy, and age
- Kaplan-Meier plots in Fig. 2 shows clear distinction of hernia risk pattern over time depending on parastomal hernia, hypertension, or obesity
- Fig. 3 shows that the median time between ostomy reversal and the first incisional hernia diagnosis was 295 days
- Most post-reversal incisional hernias (84.3%, n=70) were diagnosed **within the first two years** after ostomy reversal

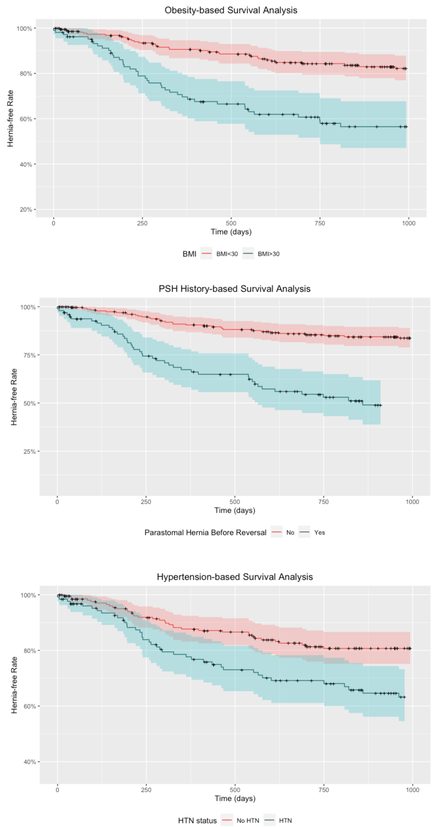


Figure 2. Kaplan-Meier plots of hernia-free survival rate over time after stomal reversal.

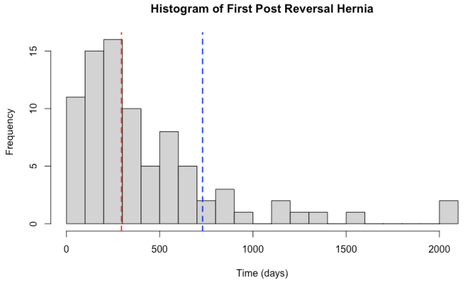


Figure 3. Histogram of first IH diagnosis after stomal reversal. The red dotted line is the median (295), and the blue dotted line is the 2-year mark.

CONCLUSION

- The likelihood of patients developing an IH throughout the entire span of ostomy treatment is substantial
- Patients with high BMI, diabetes, hypertension, or a parastomal hernia are at significantly higher odds of developing IH
- Patients who had an ostomy due to rectal trauma are at a lower risk
- We suggest further investigation in the use of preventative measures, such as mesh placement, in high-risk patient groups

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