



## Original Article

# Parastomal Hernia Following Abdominoperineal Resection



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### ABSTRACT

Parastomal Hernia (PSH) is a common complication of patient who undergone ostomy especially end colostomy. Presence of hernia defect is associated with the risk of strangulation and obstruction so understanding the potential risk factor such as patient's factor and technical issues is important. This study is evaluating the incidence of PSH hernia in patients who undergone end colostomy due to Abdominoperineal Resection (APR) in a tertiary colorectal surgery referral center and explore the possible risk factors of this complication.

The study was designed as a retrospective cross sectional study on 41 patients who undergone end colostomy due to APR. Three patient lost the follow up and 13 patients died and 25 patients were enrolled in study. Demographic data, history of smoking, steroid administration, Diabetes, obstructive pulmonary disease, transfusion, Neoadjuvant therapy, wound infection and Body mass Index (BMI) were gathered.

The mean age of participants was 58.8 and the mean BMI was 25.04 kg/m<sup>2</sup>. The incidence of PSH was 40% and 68% of operations were done with Laparoscopy. This study could not find statistically significant risk factor for PSH.

The 40% incidence of PSH is noticeable and specific strategies should be applied to reduce such complications. Larger studies is essential to investigate the possible etiologies of this complication.

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## Hérnia paraestomal após ressecção abdominoperineal

### R E S U M O

#### Palavras-chave:

Hérnia incisional  
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A hérnia paraestomal é uma complicação comum em pacientes submetidos a estomia, especialmente a colostomia terminal. A presença de defeito de hérnia está associada ao risco de estrangulamento e obstrução, portanto, é importante compreender o potencial fator de risco, como o fator do paciente e questões técnicas. Este estudo avalia a incidência de hérnia paraestomal em pacientes submetidos à colostomia terminal devido à ressecção abdominoperineal em um centro terciário de referência em cirurgia colorretal e explorar os possíveis fatores de risco dessa complicação. O desenho do estudo foi transversal retrospectivo de 41 pacientes submetidos à colostomia terminal devido à ressecção abdominoperineal. Três pacientes foram perdidos no seguimento, 13 pacientes morreram, e 25 pacientes foram incluídos no estudo. Dados demográficos, história de tabagismo, administração de esteroides, diabetes, doença pulmonar obstrutiva, transfusão, terapia neoadjuvante, infecção de ferida operatória e Índice de Massa Corporal foram coletados. A média de idade dos participantes foi 58,8 e o índice de massa corporal médio foi 25,04 kg/m<sup>2</sup>. A incidência de hérnia paraestomal foi de 40% e 68% das cirurgias foram realizadas por laparoscopia. Este estudo não encontrou fator de risco estatisticamente significativo para hérnia paraestomal. A incidência de 40% de hérnia paraestomal é perceptível e estratégias específicas devem ser aplicadas para reduzir tais complicações. Estudos maiores são essenciais para investigar as possíveis etiologias dessa complicação.

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## Introduction

Ostomy even in the form of permanent or temporary is a routine practice in colorectal surgery in order to provide fecal diversion.<sup>1</sup> It is used for variety of conditions such as colorectal cancers, inflammatory bowel disease, diverticulitis, ischemic colitis, radiation colitis and fecal incontinence. Ostomy related morbidity and its function is highly related to the indication of operation, patient's body contouring, history of previous operations and whether the ostomy is created in elective or emergency condition.<sup>2</sup>

Recent progresses in colorectal surgery although improves sphincter saving procedure but APR with end colostomy still is indicated in some cases.<sup>3</sup> In APR anus, sphincter complex and rectum are excised and the continuity of gastrointestinal tract is preserved with end colostomy.<sup>4</sup>

Ostomy is accompany with complications that are categorized as early and late complications. Early complications which are presented less than 30 days post operation comprise bleeding, ischemia, retraction, mucocutaneous separation and parastomal abscess formation.<sup>2</sup> The late complication include stricture, PSH, prolapse, retraction and varices.<sup>5</sup>

There are numerous studies that evaluate the incidence of PSH and its risk factor. Obesity (BMI > 30) is one of the risk factors that was associated with PSH<sup>1</sup> however other studies showed the association with BMI > 25<sup>5</sup> other than patient's factor surgical techniques is also associated with this pathology.<sup>3</sup> Even prophylactic mesh application is suggested to reduce the incidence of PSH.<sup>4</sup>

PSH is the most common late complication of ostomy and in patient with APR due to permanent nature of ostomy it is

essential to understand the precise incidence of pathology and its risk factors. This study is conducted in a tertiary colorectal surgery center to evaluate the incidence of this pathology and its related risk factors in our center.

## Methods

### Patients and Evaluation

After local ethics committee approval the study was conducted in retrospective manner. Patients who under gone APR between 2015 and 2019 were enrolled in the study. At first 41 patients were entered in the study and 13 of these were expired till the time of study and three patients were refused to enroll in the study and finally 25 patients were enrolled in the study.

Presence of PSH was defined as observing obvious fascial defect with herniation of bowel loops that was confirmed by CT scan. This examination and radiologic study was a part of routine postoperative follow up visits of patients with rectal cancer.

In our center all of the patients with colorectal cancers are visited every three to six month and annual abdominal CT scan is done for evaluation of metastatic disease. During these visits the patient was examined by attending colorectal surgeon and CT scan is also reviewed by attending radiologist.

#### End Ostomy Creation:

All of the patient who are candidate for APR undergone ostomy siting by an experienced ostomy nurse and the site is marked preoperatively. All of the patients whether with laparoscopic or open operation have Trans-peritoneal ostomy

**Table 1 – Descriptive Properties of Studied Population.**

	Present	Absent
Neoadjuvant Therapy	22 (88%)	3 (12%)
Corticosteroid Use	0	25 (100%)
Diabetes Mellitus	5 (20%)	20 (80%)
Smoking	11 (44%)	14 (56%)
Blood Transfusion	12 (48%)	13 (52%)
Wound Infection	2 (8%)	23 (92%)
PSH	10 (40%)	15 (60%)

via rectus muscle fibers. The marked site skin and subcutaneous fat are resected and anterior rectus sheet is opened via cruciate incision and after splitting the rectus fiber posterior rectus sheet is opened sharply and the end of remnant bowel delivered to the wound. The ostomy was matured with PDS 4-0 sutures and fixed to the fascia.

### Data Gathering

Patient chart is reviewed for age, sex, BMI, History of smoking, obstructive pulmonary disease, Diabetes mellitus, corticosteroid administration, transfusion, wound infection and Neoadjuvant therapy. The data was entered in to the data base and analyzed with SPSS Ver.21. T test was used for comparing quantitative values and for comparing qualitative variables Chi square test was used.

## Results

Between march 2015 to march 2019 we could find 41 patients who undergone APR in our center among them 13 patients were died and three patient refuse the routine follow up.

Eight women and 17 men were entered the study with mean age of  $58.8 \pm 9.2$  years old and mean BMI of  $25.04 \pm 2.6 \text{ kg/m}^2$ . Most of the surgeries were performed with laparoscopy (68%) and the mean serum albumin was  $4.08 \pm 0.3 \text{ gr/dl}$ . Most of the patients (88%) were received Neoadjuvant therapy and none of the patients were receive corticosteroid in perioperative period. The prevalence of smoking was 44% and 20% of patients were diabetic.

Table 1 demonstrates the descriptive properties of studied population. The rate of perioperative transfusion was 48% and 8% of patients were developed with ostomy site wound infection.

The incidence of PSH was 40% among the studied patients. The mean age of patients with PSH was 57.3 years old while this mean was 59.8 years in patients without PSH and this difference is not statistically significant. The mean BMI and serum albumin was also similar in patients with and without PSH.

Sex distribution was also similar in patients with and without PSH. While 50% of patients who undergone open APR had PSH this rate was 35.3% in patients who operated with laparoscopy but this difference was not significant too. Neoadjuvant therapy was not also a risk factor for PSH since one patient out of three patient who were not received Neoadjuvant therapy developed with PSH but nine out of 22 patients who received Neoadjuvant therapy developed with PSH.

**Table 2 – Distribution of PSH in Different Groups.**

Risk	With PSH	Without PSH	P value
Mean Age (Years)	57.3	59.8	0.508
Mean BMI (Kg/m <sup>2</sup> )	25.8	24.5	0.242
Mean Serum Albumin (gr/dl)	4.2	4	0.168
Female	2	6	0.402
Male	8	9	
Open Procedure	4	4	0.667
Laparoscopic Procedure	6	11	
Neoadjuvant Therapy	9	13	0.99
Diabetes Mellitus	7	13	0.358
Smoking	5	6	0.697
Transfusion	6	6	0.428
Ostomy Site infection	1	1	0.99

Table 2 demonstrate the distribution of PSH incidence between different risk factors. Diabetes mellitus was not also a risk factor of PSH since the incidence of PSH was 35% in non-diabetic and 60% in diabetic but this difference was not statistically significant. The incidence of PSH in smokers was not different from nonsmokers.

The incidence of PSH in patients who received perioperative transfusion was 50% while in patients who did not receive transfusion this rate was 30.8% (P value: 0.428). Two patients develop ostomy site infection that one of them develop PSH and this is not statistically significant too. Since some of the patients were completely asymptomatic and hernia only was detected in CT scan all of the PSHs were found one year after the operation.

## Discussion

This study was conducted to evaluate the incidence of PSH in patients who undergone APR with end colostomy. PSH thought to be the most prevalent late onset complication of ostomy which indeed is an incisional hernia due to abdominal wall defect following ostomy creation. The incidence of PSH is lower with physical exam but joined with radiologic finding the incidence increased because of detection of some occult forms of PSH.<sup>6</sup> so in this study the incidence was estimated both by physical exam and CT scan.

There are previous reports about incidence of PSH, in Spain the follow up of 35 patients with APR showed the incidence of 47% based on radiologic evaluation.<sup>7</sup> Another study with mean 953 days follow up of 80 patients demonstrate the incidence of 27.5% for PSH.<sup>3</sup> another study with sample size of 158 patients report the incidence of 17% for PSH.<sup>5</sup> Danish report with evaluation of 5019 patients with 400 days follow up demonstrate the incidence of 36.2% for PSH.<sup>8</sup> our study estimates the incidence of 40% for PSH which is similar to some of previous studies.

In this study we evaluate some of the possible risk factors of PSH such as age<sup>9</sup>, sex<sup>8</sup>, BMI<sup>1</sup>, History of smoking, obstructive pulmonary disease, Diabetes mellitus, corticosteroid administration, transfusion, wound infection and Neoadjuvant therapy which were derived from previous studies. The incidence of PSH is thought to be higher with laparoscopic approach<sup>10</sup> as was showed in our study but this difference was not statistically significant in our study.

Our study follow 25 patients and this sample size might be the possible cause of none significant results for determining the risk factor although we should consider the normal variation of patients character between different populations. So the authors of this study highly suggest investigations with large sample size for better determining this pathology risk factors.

There are some interventions previously reported to reduce the incidence of PSH such as prophylactic mesh application<sup>11</sup> at the time of ostomy creation and retroperitoneal<sup>12</sup> construction of end ostomy. With regarding to the high incidence of PSH these methods should be considered in such patients however extension of operation time is a debate.

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### Conflicts of interest

The authors declare no conflicts of interest.

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