ORIGINAL RESEARCH

Clinical and radiological assessment of incisional hernias following closure of temporary stomas

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ABSTRACT
Background: Incisional hernias are a frequently observed complication following abdominal surgeries, with incidence rates reported between 2% and 11% among patients undergoing these interventions. Hence; the present study was conducted for assessing clinical and radiological assessment of incisional hernias following closure of temporary stomas. **Materials & methods:** A cohort of 100 patients who had undergone either ileostomy or colostomy closure was included in this study. The inclusion criteria specified that participants must have had a reversal of any type of ileostomy or colostomy and must have undergone either computed tomography (CT) or magnetic resonance imaging (MRI) at least three months post-stoma reversal. A radiologist was specifically trained to detect abdominal wall and incisional hernias using the imaging techniques employed in this study (CT or MRI), following a standardized proforma. A radiological hernia was defined by the presence of: (1) a discontinuity in the transverse abdominal fascia; (2) the visualization of fat, peritoneum, or bowel breaching a surgical incision site, either in the right or left iliac fossae for stoma site hernias or along the midline for midline incisional hernias. All findings were documented in a Microsoft Excel spreadsheet and subsequently analyzed statistically using SPSS software. Univariate analysis was done for evaluation of level of significance. **Results:** A total of 100 patients were evaluated. Among these 100 patients, 40 patients were with hernia at site of stoma reversal, while remaining 60 patients were without hernia. Among patients with hernia, there were 32 males and 8 females. Among patients without hernia, males and females were 50 and 10.Clinical follow-up, radiographic imaging and combined methods showed rate of incisional hernia a at site of stoma reversal to be 15 percent, 33 percent and 39 percent respectively. **Conclusion:** The occurrence of hernias at the sites of stoma closure may be more prevalent than previously thought. Advanced imaging techniques, such as computed tomography (CT) scans, could serve as an early indicator for the development of clinically significant hernias at a later stage
Key words: Incisional hernias, Stomas

INTRODUCTION

Incisional hernias are a frequently observed complication following abdominal surgeries, with incidence rates reported between 2% and 11% among patients undergoing these interventions. While some hernias present shortly after the surgical procedure, others may remain undetected for many years.[1, 2] The risk factors contributing to the development of incisional hernias have been extensively documented, and several of these factors can be modified by the surgeon, particularly through the choice of repair technique. Historically, the surgical repair of incisional hernias was linked to a significant rate of recurrence. However, advancements in recent years, particularly the use of synthetic prosthetic materials, have enabled the implementation of tension-free repair techniques, which have subsequently led to a decrease in recurrence rates.[3, 4]

Several patient-related factors are associated with an increased risk of developing incisional hernias. These factors encompass obesity, advanced age, abdominal distension, postoperative pulmonary complications, male sex, and the presence of jaundice. Furthermore, specific elements pertaining to the execution of the initial surgical procedure have been identified as influencing the probability of hernia formation. These elements include the occurrence of wound infections, the nature of the incision and closure methods

employed, as well as the type of suture material utilized.[5, 6]Prior systematic reviews and meta-analyses examining complications associated with stoma reversal have indicated that colostomies are linked to higher complication rates in comparison to ileostomies. These analyses reported the incidence of incisional hernia following stoma reversal to be between 6% and 10%.[4- 6]Hence; the present study was conducted for assessing clinical and radiological assessment of incisional hernias following closure of temporary stomas.

MATERIALS & METHODS

The present study was conducted for assessing clinical and radiological assessment of incisional hernias following closure of temporary stomas.A cohort of 100 patients who had undergone either ileostomy or colostomy closure was included in this study. The inclusion criteria specified that participants must have had a reversal of any type of ileostomy or colostomy and must have undergone either computed tomography (CT) or magnetic resonance imaging (MRI) at least three months post-stoma reversal. A clinical hernia was characterized by either (1) the documented presence of a symptomatic hernia, as reported by the patient and confirmed through clinical examination at the site of the closed stoma, or (2) the necessity for surgical intervention to repair a hernia at the closed stoma site. Clinical documentation following stoma reversal was meticulously reviewed for each participant, and data were systematically recorded on a standardized proforma. A radiologist was specifically trained to detect abdominal wall and incisional hernias using the imaging techniques employed in this study (CT or MRI), following a standardized proforma. A radiological hernia was defined by the presence of: (1) a discontinuity in the transverse abdominal fascia; (2) the visualization of fat, peritoneum, or bowel breaching a surgical incision site, either in the right or left iliac fossae for stoma site hernias or along the midline for midline incisional hernias. All findings were documented in a Microsoft Excel spreadsheet and subsequently analyzed statistically using SPSS software.Univariate analysis was done for evaluation of level of significance.

RESULTS

A total of 100 patients were evaluated. Among these 100 patients, 40 patients were with hernia at site of stoma reversal, while remaining 60 patients were without hernia. Among patients with hernia, there were 32 males and 8 females. Among patients without hernia, males and females were 50 and 10.Clinical follow-up, radiographic imaging and combined methods showed rate of incisional hernia a at site of stoma reversal to be 15 percent, 33 percent and 39 percent respectively.

Table 1: Basic demographic of patients (combined clinical and radiological assessment)

Variable	Patients with hernia at site of stoma reversal (n= 40)	Patients without hernia (n= 60)
Mean age (years)	58.3	61.4
Males	32	50
Females	8	10
Colostomy: Ileostomy	10:30	15:45
Presence of midline hernia	21	25

Table 2: Rate of incisional hernia a at site of stoma reversal by detection method

Detection method	Number of hernias	Rate of hernia
Clinical follow-up	15	15
Radiological imaging (CT/MRI)	33	33
Combined method	39	39

DISCUSSION

The advent of prosthetic mesh has significantly transformed the management of groin hernias; however, its influence on the treatment of incisional hernias remains minimal to this day. The development of incisional hernias is associated with several risk factors, including obesity, diabetes, emergency surgical procedures, postoperative wound dehiscence, smoking, and infections at the surgical site. When obtaining informed consent, it is crucial to communicate the potential risks associated with incisional hernia repair, which encompass seroma formation, wound infections, damage to intra-abdominal structures, and the possibility of recurrence. Notably, significant complications that may arise during the repair of large incisional hernias include mesh infections and enterocutaneous fistulas, both of which can lead to extended periods of morbidity and may necessitate further surgical intervention. Current guidelines suggest that only incisional hernias measuring less than 3 cm should be addressed through primary tissue approximation with sutures, a subject that will not be elaborated upon here. Over time, small incisional hernias can progress to larger ones due to the persistent intra-abdominal hydrostatic pressure of approximately 15 cm of water, diaphragmatic movements during respiration, and increased abdominal pressure from actions such as coughing and straining, which can exert pressures exceeding 80 cm of water, alongside myofascial

retraction of the lateral abdominal muscles. Consequently, this leads to a contraction of the abdominal cavity, resulting in the loss of the anatomical space for the herniated visceral mass.[7-9]

A total of 100 patients were evaluated. Among these 100 patients, 40 patients were with hernia at site of stoma reversal, while remaining 60 patients were without hernia. Among patients with hernia, there were 32 males and 8 females. Among patients without hernia, males and females were 50 and 10.Clinical follow-up, radiographic imaging and combined methods showed rate of incisional hernia a at site of stoma reversal to be 15 percent, 33 percent and 39 percent respectively. Bhangu A et al described this rate in patients with closed stomas who had definitive post-operative imaging of their abdominal wall. A retrospective review of patients who had undergone stoma reversal and had a CT or MRI scan of the abdomen ≥2 months following reversal was performed. A radiologist, blinded to the original radiological report and clinical results, reviewed all scans for abdominal wall herniation. This was correlated to documented clinical findings.Fifty-nine patients were included: 49 loop ileostomy and 10 end colostomy reversals. CT scans were performed for 57 patients and MRI for two. The median time from closure to imaging was 10 months (range 3-32 months). The combined clinical and radiological hernia rate was 34% (20/59). Imaging alone produced a rate of 31% (18/59). The clinical rate of hernia detection was 14% (8/59). Using the rate of clinical herniation as the detection standard, imaging had a low positive predictive value (33%, 6/18) but a high negative predictive value (95%, 39/41). Four patients required surgical repair of their stoma site hernia (20%, 4/20).One in three patients undergoing stoma closure developed an incisional hernia. One in five of those with a hernia underwent surgical repair. Definitive imaging may provide an early surrogate marker for late clinically relevant hernias.[10]Schreinemacher MH et al assessed Incisional hernias in temporary stoma wounds. Of 150 living patients, 111 (74.0%) were included for analysis after follow-up at the outpatient clinic.The main outcome was incisional hernia in a temporary stoma wound, defined as a defect within the musculature and fascia detected by ultrasonographic examination. Risk factors for incisional hernias and the diagnostic validity of clinical symptoms and palpation during the Valsalva maneuver were determined.After a median follow-up of 35 months (range, 5-77 months), hernia prevalence was 32.4%. Among patients with a body mass index (calculated as weight in kilograms divided by height in meters squared) of less than 30, hernia prevalence was 25.8%; among patients with a body mass index of 30 or higher, hernia prevalence was 59.1%. Palpation demonstrated the highest sensitivity (58.3%). One in 6 patients had discomfort at the temporary stoma site and no palpable defect but showed an incisional hernia on ultrasonographic examination. Obesity was the sole significant risk factor identified in this study (odds ratio, 5.53; 95% confidence interval, 1.72-17.80). The presence of a stoma in situ for less than 6 months showed a trend toward being a risk factor (odds ratio, 2.38; 95% confidence interval, 0.96-5.99).Incisional hernias occur in 1 of 3 temporary stoma wounds, and a body mass index of 30 or higher is a risk factor.[11]

CONCLUSION

The occurrence of hernias at the sites of stoma closure may be more prevalent than previously thought. Advanced imaging techniques, such as computed tomography (CT) scans, could serve as an early indicator for the development of clinically significant hernias at a later stage.

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