

Parastomal hernia is an independent risk factor for incisional hernia in patients with end colostomy

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Background. Incisional hernia (IH) is the most frequent complication after abdominal operation, with an incidence of 11–20% and up to 35% in risk groups. Known risk groups for IH are abdominal aortic aneurysm and obesity. Our hypothesis is that parastomal hernia (PH) might also represent a risk factor for developing IH. Identifying risk factors can help determine the need for preventive measures such as primary mesh augmentation.

Methods. In a multicenter cross-sectional study, all patients who were operated between 2002 and 2010 by means of a Hartmann procedure or abdominoperineal resection were invited for a follow-up visit to our outpatient clinic. Primary outcome measures were the prevalence of IH and PH. All possible risk factors for IH were scored. A physical examination was performed and, when available, computed tomography was scored for IH and PH.

Results. A total of 150 patients were seen in the outpatient clinic. The median follow-up was 49 months (range, 30–75). IH had a prevalence of 37.1%, and PH had a prevalence of 52.3% during physical examination. On CT the prevalence was even greater, ie, 48.3% and 52.9%. IH and PH were both present in the same patient in 30% of all examined and in 35.6% after CT examination. PH was found to be a risk factor for IH on univariate and multivariate logistic regression analyses of variance, with an odds ratio of 7.2 (95% confidence interval 3.3–15.7). In addition, an emergency operation was found to be a risk factor for IH with an odds ratio of 5.8 in the multivariate analyses.

Conclusion. Patients with a PH have a 7 times greater chance of developing an IH compared to patients without PH. (Surgery 2014;155:178-83.)

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PATIENTS DIAGNOSED WITH ABDOMINAL PATHOLOGY can be operated by open midline laparotomy. With an incidence of 11–20%, incisional hernia (IH) is the most frequent complication after midline laparotomy.¹⁻³ The presence of IH is associated with pain, impaired quality of life, and potentially life-threatening complications, such as incarceration or strangulation of the bowel.^{4,5} In a substantial proportion of patients operatively treated for abdominal pathology, a stoma is necessary.⁶ Parastomal hernia (PH) is a frequent complication after the creation of a stoma, with an incidence of up to 48%.⁷

Clinical findings in our center suggest that PH might be a risk factor for later IH. PH disrupts the normal abdominal wall anatomy and might therefore induce a greater incidence of IH. Currently known risk factors for IH development are obesity and abdominal aortic aneurysm (AAA), with incidences of up to 35%.⁸⁻¹³ The identification of risk groups provides surgeons with the possibility of adapting or changing their techniques such as primary mesh augmentation to prevent the occurrence of IH.^{9,10} A better understanding of the etiology of IH also may be obtained with greater insight into the association between PH and IH. We hypothesized that the presence of a PH would be a risk factor for the occurrence of IH occurrence.

METHODS

A cross-sectional study was conducted at the Erasmus University Medical Center in Rotterdam and the Albert Schweitzer Hospital in Dordrecht, the Netherlands. All patients who had been

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operated either using a Hartmann procedure (HMP) or abdominoperineal resection (APR) between 2002 and 2010 were screened for eligibility. Patients with HMP and APR were included because the end colostomy created during these operations is permanent (APR) or is not restored in most patients (HMP).¹⁴ Patients who died and patients with an anastomosis created in a second operation to restore the natural fecal route were excluded.

Those patients willing to participate provided their informed consent and were seen in our outpatient clinic. Follow-up examination was conducted by 2 physicians experienced in the investigation of hernia. Physical examination was performed to determine the presence of IH and/or PH. IH was defined as any abdominal wall gap with or without a bulge in the area of a postoperative scar perceptible or palpable by clinical examination and/or imaging.¹⁵ PH was defined as any palpable defect or bulge adjacent to the stoma when the patient was supine with their elevated legs or erect and coughing or straining.¹⁶ The length of the incision scar was measured and, when present, the position and size of the hernia was measured and scored using the European Hernia Society classification system.¹⁷ If present, postoperative computed tomography (CT) was scored for PH and IH independently by 2 investigators.

Information on possible risk factors for herniation was obtained: sex, age, weight, height, body mass index (BMI), current smoking (defined as 5 cigarettes per day or more), corticosteroid use (current user of any dose), chronic obstructive pulmonary disease, diabetes mellitus (defined as current user of specific diabetic type of drugs or use of insulin), previous midline incision, AAA, previous hernia (inguinal, umbilical, incisional, hiatal), postoperative complications (surgical-site infection [SSI], abdominal dehiscence, pneumonia, ileus), emergency operation, chemotherapy (defined as any type or dose of oral or intravenous chemotherapy), radiotherapy (defined as any type or dose of radiotherapy), and partaking in physically strenuous work.

χ^2 tests and Mann-Whitney *U* tests were used to compare risk factors for IH and PH. Univariate and multivariate logistical regression analyses were conducted to predict odds ratios (ORs) of potential risk factors. Risk factors that were discovered in this study or were known in the literature will be added to the multivariate logistic regression analyses. All statistical calculations were done using IBM SPSS 17 Software (SPSS, Chicago, IL).

RESULTS

Between 2002 and 2010, 574 patients underwent either APR or HMP. Over the duration of our study, 244 of these patients died; 87 could not be reached because of relocation or invalid contact information; and 54 patients did not wish to participate because of diminished physical condition or other reasons. Of the remaining 189 patients who were willing to participate, 23 were excluded because of removal of the stoma and 16 did not show up for follow-up (Fig 1). Of the 150 included patients, 118 (78.7%) patients had undergone APR, 89 (59.3%) were male, the mean age was 67.4 years (SD 10.2), mean BMI was 25.9 (SD 5.1), and median time to follow-up was 49 months (interquartile range 30–75). Of all the 150 operations, 119 patients were operated because malignant disease and 31 times because of disease of benign nature (eg, diverticulitis, Crohn's disease, ulcerative colitis ulcerosa, fistulas). Most patients (92.4%) treated for malignant disease were operated by means of APR. Most patients (68.7%) who were treated for disease of a benign nature were operated by means of a HMP. In all midline closures, a continuous closure technique with a slowly absorbable suture was used. The suture length to wound length ratio was not measured.

Risk factors. All possible risk factors were scored and the results are presented in Table I. The presence of a PH was an important risk factor for the occurrence of IH ($P < .001$). HMP, age, and length of the incision also were risk factors for developing IH. AAA and emergency operation both showed a tendency to increase the risk for IH.

No differences were discovered between hospitals or follow-up period. During univariate analysis, an OR of 7.2 (95% confidence interval 3.3–15.7) was found for PH at the occurrence of IH. When we controlled for possibly confounding variables in the logistic regression analyses (BMI, age, length of the incision, type of operation, emergency operation, and radiotherapy), PH remained a predictor of IH. Age and length of incision also remained predictors but had clinically irrelevant ORs (OR 1.05 and OR 1.1). In the logistic regression analysis, an emergency operation was found to be a risk factor for IH (OR 5.8; $P = .016$). HMP proved not to be a risk factor after we controlled for possible confounding variables.

Prevalence. During physical examination of 150 patients, 56 IHs (37.3%) and 79 PHs (52.7%) were diagnosed (Table II). Both hernia types were present in the same patient in 45 cases ($P < .001$).

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