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Recurrence After Incisional Hernia Repair: Results and Risk Factors

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Abstract: A relatively low success rate in recurrent incisional hernia repair has prompted us to review the effects of certain risk factors on the long-term outcome of our cases. In this study, 109 recurrent incisional hernias were repaired and reviewed between 7 and 92 months after the operation. The recurrence rate was 45.0%. Many conditions that have been implicated as causal factors in the occurrence of incisional hernias were not found to be associated with recurrence after repair. However, chronic constipation was determined to be the most prominent risk factor associated with late recurrence.

Key Words: hernia, incisional, postoperative, repair, recurrence, risk factors, constipation

Introduction

Although the incidence of incisional hernias after abdominal operations is no higher than 10%,[1,2] the recurrence rate after repair of an incisional hernia may be somewhat higher. In one study, recurrence appeared in 48 (31%) of 154 patients after 3 years.[3] Manninen et al. also reported a 51.4% recurrence rate after the repair of recurrent incisional hernias.[4] The risk factors associated with the occurrence of incisional hernias have been well documented.[1] However, information on the long-term results of incisional hernias repaired more than once is limited. This study was carried out to assess the effects of conventionally accepted risk factors for incisional hernias on the recurrence of repaired incisional hernias.

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Patients and Methods

In the present study, 109 hernia repair operations for recurrent incisional hernias were performed on 101 patients between 1985 and 1992. The patients' mean age was 51.6 ± 10.4 (range 27–76) at the time of operation. Patients with chronic renal or liver diseases, malignancies, or ascites, and those undergoing steroid therapy were excluded from the study. The average follow-up was more than 3 years (43.0 ± 21.9 months, range 7–92 months). The body mass index (BMI) was calculated as [BMI = (weight)/(length)^2], where the length was in meters and the weight was in kilograms. Figures between 20 and 25 kg/m^2 were taken as normal. Patients who complained of an inability to defecate or had hard bowel movements, bloating, and an inadequate, incomplete, or infrequent evacuation were classified as constipated. All of these constipated patients reported that they required long and forceful straining to defecate. Details of the patients and the other factors tested in the study are given in Table 1.

Results

The results of the incisional hernias were described either as "recurrence" or "no recurrence" at the time of the last control. The recurrent hernias varied in size. Recurrence was observed in 49 of 109 cases (45.0%); hence 60 cases showed no recurrence (55.0%). The distribution of recurrence for each risk factor is shown on Table 1.

Twenty-two patients could remember the exact dates of recurrence. The distribution of recurrence according to time is given in Fig. 1.

Statistical analyses of the various factors are shown in Table 2. Both older age and the presence of chronic constipation were statistically significant in the recurrence of incisional hernias, based on multivariate logis-

Table 1. Patient details, risk factors, and recurrence rates in repaired incisional hernias

		Number of patients (%)	Number of recurrences (%)
Sex	Male	34 (30)	14 (41.1)
	Female	75 (70)	34 (45.3)
Type of incision	Upper median	24 (22)	10 (41.7)
	Lower median	19 (17.4)	5 (26.3)
	Paramedian	15 (13.8)	6 (40)
	Pfannenstiel	12 (11)	7 (58.3)
	Subcostal	11 (10.1)	6 (54.5)
	Median (lower + upper)	10 (9.2)	3 (30)
	Lumbar	9 (8.3)	6 (67)
	Appendectomy site	8 (7.3)	3 (37.5)
Reoperation	Present	18 (16.5)	7 (38.9)
	Absent	91 (83.5)	40 (43.9)
Number of previous recurrences	1	63 (57.8)	27 (43)
	2	27 (24.8)	13 (48)
	3 or more	19 (17.4)	7 (36)
Type of hernia repair	Simple closure (Total)	59 (54)	23 (40)
	Simple closure (interrupted sutures)	45 (76.5)	16 (35.5)
	Simple closure (continuous sutures)	12 (20)	7 (58.3)
	Simple closure (two layers)	2 (0.5)	0
	Keel technique	29 (26.4)	15 (51.7)
	Mayo repair	13 (11.9)	7 (53)
	Synthetic graft material	8 (7.3)	4 (50)
Postoperative wound infection	Present	26 (23.8)	15 (57.7)
	Absent	83 (76.2)	43 (40.9)
Suture material	Silk	64 (58.7)	30 (46.9)
	Nylon	14 (12.8)	4 (28.5)
	Polyglactin 910	11 (10)	6 (54.5)
	Others	20 (18.2)	—
Academic rank of the surgeon	Consultant	63 (57.8)	30 (47.6)
	Chief resident	10 (9.2)	6 (60)
	Resident	36 (33)	13 (36.1)
Chronic constipation	Present	43 (39.5)	25 (58.1)
	Absent	66 (60.5)	24 (36.3)
Chronic pulmonary disease	Present	26 (23.9)	16 (61.5)
	Absent	83 (76.1)	33 (39.7)

tic regression analysis. The significance of the presence of chronic constipation was also confirmed by chi-squared analysis. The presence of a postoperative wound infection and chronic pulmonary disease characterized by frequent coughing were both found to be

Table 2. Statistical analyses of the risk factors for incisional hernia recurrence

Risk factors	Chi-square ($P =$)	Multivariate logistic regression ($P =$)
Age	—	0.01
Sex	>0.05	0.06
Body mass index	>0.05	0.17
Type of incision	—	0.31
Reoperation	>0.05	0.63
Number of previous recurrences	—	0.83
Type of hernia repair	>0.05	0.55
Interrupted or continuous sutures with a simple closure technique	0.05	—
Postoperative wound infection	0.05	0.23
Suture material	>0.05	0.88
Academic rank of the surgeon	>0.05	0.09
Chronic constipation	0.05>	0.05
Chronic pulmonary disease	0.05>	0.11

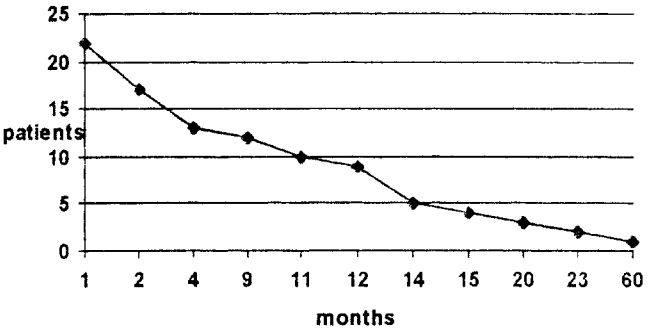

Fig. 1. The time of recurrence after hernia repair

significant based on chi-squared analysis, but these results could not be confirmed by multivariate logistic regression analysis. In the simple closure technique of incisional hernia repair, the cases repaired by interrupted sutures showed significantly less recurrence than the ones with continuous sutures.

Discussion

Our findings indicated that the factors conventionally held responsible for the initial occurrence of incisional hernias may not play an important role in hernia recurrence after repair. Though our rate of recurrence was high, it was almost the same as that observed by other centers.[3]

As in the occurrence of primary incisional hernias, recurrence may also appear after several months.[5] In one of our cases, recurrence appeared as late as 60 months. However, the majority of recurrences were seen in the first few months. Unfortunately, less than

half of the patients were able to give the exact date of their recurrences (Fig. 1).

Factors such as sex, age, and obesity, which have been shown in previous studies to have a significant correlation with the occurrence of incisional hernias,[5–8] demonstrated no significant relation with the recurrence of repaired hernias in our series (Table 2).

Both older age and chronic constipation were significantly related to the recurrence of repaired incisional hernias. In addition, in the present study, chronic pulmonary disease and postoperative wound infection were also significantly correlated with recurrence based on a less specific statistical test (chi-squared). In Ellis and colleagues' study, neither the wound infection nor the postoperative chest infection was significantly related to the occurrence of incisional hernias.[5] On the other hand, Pollock and Evans[8] reported that patients with a wound infection are more likely to develop incisional hernias.

In conclusion, we have now changed our patient selection criteria for incisional hernia repair based on the findings of this study: We are now reluctant to operate on older patients with chronic pulmonary disease, as characterized by chronic coughing, and on those with chronic constipation. Although the repair technique seemed to have no significant effect on recurrence in our study, and while some studies have shown continuous wound closure to have some advantages over interrupted sutures,[9] we are now more inclined to use a far-near, near-far interrupted suture technique rather than continuous sutures for small incisional hernias. In addition, we have started to use tension-free sutured prolene or mersilene patches at a gradually increasing rate in recent years. Although there are some series reporting a recurrence rate of 6%–11% after prolene mesh repair,[10,11] it is too early for us to comment on the effects of this policy regarding the incidence of recurrence after incisional hernia repair.

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