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ORIGINAL ARTICLE

Proctologic surgery done by residents – Complications preprogrammed?



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KEYWORDS

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Summary

Introduction: In current literature, the participation of residents in surgical procedures is discussed as a negative outcome factor, particularly due to an increase of postoperative complications. This study investigated whether minor proctologic surgery with resident participation has a higher rate of postoperative complications.

Patients and methods: All patients who underwent an elective Milligan-Morgan hemorrhoidectomy or a resection of pilonidal sinus with rotational flap closure between January 2007 and December 2013 where included in a retrospective database. Primary outcome measure was postoperative complications rate with and without resident participation.

Results: Forty-two (6 females: 36 males) patients underwent resection of pilonidal sinus and 61 (17 females: 44 males) patients received a hemorrhoidectomy. Twenty-two patients with pilonidal sinus and 26 patients with hemorrhoids were operated by residents. There were no differences in patient demographics. Residents need significantly more time to perform a pilonidal sinus resection (54 min vs. 34.5 min; $P = 0.004$). For hemorrhoidectomy, there were no significant differences in operative time (24 min vs. 23.5 min; $P = 0.656$). There were no significant differences in the resident and the consultant group, neither in hemorrhoidectomy nor in pilonidal sinus resection regarding readmission or outpatient visits. In the group of patients with pilonidal sinus resections, 3 patients developed a recurrence, leading to a recurrence rate of 7.1% without significant differences between the two groups (0 vs. 3; $P = 0.09$).

Conclusion: The participation of residents in proctologic procedures is not associated with higher postoperative complication rates. Residents should be exposed to proctology procedures on a regular basis, even though the operative time will be prolonged.

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Introduction

In an era of enhanced emphasis on patient safety, the participation of residents in surgical procedures is critically discussed. On one hand, residents have to participate in and perform surgical procedures for educational purposes, on the other hand, the involvement of residents may

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affect surgical outcome. Several studies have been published in recent years addressing the issue of the impact of resident participation on complication rates and outcome, which are mostly based on extensive data provided by the National Surgical Quality Improvement Program (NSQIP) of the American College of Surgeons [1,2]. Furthermore, some of these studies analyzed the effects on health care and costs of resident training [3,4]. Most studies come to the similar conclusion that the involvement of residents leads to increased operation time. Hernandez-Irizarry et al. revealed a significantly increased operation time in laparoscopic inguinal hernia repairs between staff surgeons versus residents with a median difference of 19 minutes [5]. In contrast, several studies failed to reveal significant differences in operative time between residents and consultants. Uecker et al. demonstrated in a subset of standard surgical procedures such as thyroidectomy, laparoscopic appendectomy or cholecystectomy, breast resection and others, no significantly longer operation times [6]. An important issue which is addressed by an increasing amount of studies is the effect of resident participation on postoperative morbidity and complication rates [7,8]. Kiran et al. were the first to report a significantly increased rate of mild complications in 60,711 surgical patients. Furthermore, Fischer et al. reported that resident participation was associated with a significantly increased risk of surgical complications, and residents' experience was inversely related to this risk in 4328 patients undergoing reductive breast surgery [8]. However, no significant effect of resident participation on mortality has been reported to date [9–11].

The relation between resident participation was studied in different surgery specialties encompassing general, orthopedic and gynecological surgery [3,8,12,13]. Regarding general surgery, no studies addressed the influence of resident participation in proctology, which is an often neglected, but from a socio-economic point of view, a vital branch of general surgery. Furthermore, with procedures like Milligan-Morgan hemorrhoidectomies, young surgeons are exposed to the pelvic floor and the anal sphincter for the first time, which is a good training procedure in the course towards advanced colorectal surgery such as low rectal resections with colo-anal anastomoses.

The aim of this study was to investigate the effect of resident participation in Milligan-Morgan hemorrhoidectomy or excision of pilonidal sinus and closure of the defect using a rotation flap (Schrudde-Olivari procedure), as these procedures are performed by board certified surgeons as well as residents and represent standard proctologic procedures, on postoperative outcome and operative time.

Patients and methods

Patient characteristics were retrospectively collected from a recorded database for hemorrhoidectomies and resections of pilonidal sinus between January 2007 and December 2013 after approval of the study by the Institutional Review Board.

The database comprised data on age, gender, surgical procedure, operation time, postoperative complications and follow-up. It also provided information about surgeons and their training status. Only adult patients who underwent Milligan-Morgan hemorrhoidectomy or excision of pilonidal sinus and closure of the defect using a rotation flap (Schrudde-Olivari procedure) were included in this

study, representing standard procedures that are performed by board certified surgeons as well as residents [14,15].

The patients were divided into two groups: group A (patients receiving operation with resident participation) and group B (patients receiving operation without resident participation). Resident participation was defined as surgery performed by a resident under the supervision of a consultant. Both groups were evaluated for the impact on the intraoperative and postoperative variables. Primary outcome parameter was operative time, secondary outcome parameters were complication rates, especially reoperation and readmission rates. Postoperative complications have been classified using the Clavien-Dindo classification [16].

Statistical analysis

Comparisons between both groups were made with a Chi² or Fisher's exact test. The Kaplan-Meier method was used for survival analysis. For comparison of survival curves, the log rank test was used. Univariate regression analyses were performed using multiple logistic regression models. SPSS software, version 20.0 (IBM SPSS Statistics®), was used for statistical analysis. A $P \leq 0.05$ was considered statistically significant.

Results

Patient demographics and comorbidities

A total of 42 patients underwent resection of pilonidal sinus and 61 patients underwent a hemorrhoidectomy between January 2007 and December 2013. Twenty-two out of 42 patients (52%) who underwent pilonidal sinus resection received were operated by residents under supervision and 20 (48%) patients were operated by a consultant. Thirty-five out of 61 patients (57%) who underwent hemorrhoidectomy were operated by consultants whereas 26 (43%) received surgery by residents under supervision.

The median age of patients underwent resection of pilonidal sinus was 27 years (range: 17–51 years) and for patients undergoing hemorrhoidectomy 44 years (range: 21–79 years). Thirty-six (85.7%) patients with pilonidal sinus and 44 (72.1%) of patients undergoing hemorrhoidectomy were male. The median body mass index for the pilonidal sinus group was 25 (range: 19–46) and 24 (range: 18–44) for the hemorrhoidectomy group.

Cases with resident involvement had no significant differences in patient demographics and comorbidities compared to consultants' cases. Furthermore, the number of emergency procedures did not significantly differ between the two groups (Tables 1 and 2).

Operative time

The median operative time in the group with resection of pilonidal sinus was 43.5 min (range: 20–112 min) and 24 min (range: 7–85 min) in the hemorrhoidectomy group. Pilonidal sinus operations by residents took significantly more time than operations by consultants (54.0 min vs. 34.5 min, $P=0.004$; Fig. 1). Operation time for hemorrhoidectomy was not significantly longer if surgery was performed by residents (24.0 min vs. 23.5 min; $P=0.656$; Fig. 1).

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