Original Article

Impact of Advanced Age on Postoperative Outcomes in Hemorrhoidectomy Patients

Jeremiah Chuan Qi Wong
Wen-Ko Tseng
Chung-Wei Fan
Yen-Lin Yu
Division of Colorectal Surgery, Department of Surgery, Chang Gung Memorial Hospital, Keelung, Taiwan

Introduction. Hemorrhoids are not a life-threatening disease, but hemorrhoidectomy exhibits significant improvement in the quality of life among the patients with indications. Along with an aging society, the number of elderly patients with hemorrhoidectomy treated with a surgical modality has gradually increased. The decision regarding surgical intervention needs to be weighed with the risks of comorbidities, and there are no guidelines in this endeavor. Our study compares the short-term outcomes of hemorrhoidectomy between elderly and younger patients, which clarify the risks associated with an increasingly geriatric population in the face of hemorrhoidectomy.

Materials and Method. A total of 300 patients who underwent hemorrhoidectomy for Goligher classification grades 3 or 4 hemorrhoids at our institution between 2017 and 2018 were enrolled. According to the clinical characteristics, the univariable and multivariable regression was used to identify risk factors for postoperative complications.

Result. Our data confirmed that old age was not an independent risk factor for post-hemorrhoidectomy complications. The operation time, length of hospital stays, outpatient clinic follow-up duration, and percentage of patients with complications were similar between the elderly and younger groups. Multivariate analysis identified sex (OR = 2.02 [95% CI, 1.10-3.73]; $p = 0.02$) and operation time (OR = 1.06 [95% CI, 1.03-1.09]; $p = 0.01$) were independent risk factors for post-hemorrhoidectomy complications. LigaSure™-assisted hemorrhoidectomy (OR = 0.46 [95% CI, 0.24-0.86]; $p = 0.02$) could reduce the complications.

Conclusion. Age alone is not an independent risk factor for patients undergoing hemorrhoidectomy. However, other factors, including sex and a longer operation time, may increase the risk of higher postoperative complications.

[*J Soc Colon Rectal Surgeon (Taiwan) 2021;32:70-79*]

Hemorrhoids, a medical and surgical disease, is a common complaint among people visiting a coloproctologist. In healthy individuals, the anal cushions are normal anal canal structures that aid in maintaining anal continence by expanding to fill the anal canal at rest. However, these are renamed hemorrhoids when they bleed or protrude.[1] Hemorrhoids can be classified based on the location and degree of prolapse. Internal hemorrhoids originate superior to the dentate line, whereas external hemorrhoids are located inferior to the dentate line; mixed-type hemorrhoids are those with a combined presentation. The extent of

internal hemorrhoid prolapse is graded on a scale from grade I to IV. Grade I is defined as an asymptomatic outgrowth of the anal mucosa; grade II refers to a prolapsed hemorrhoid that reduces spontaneously after straining; grade III indicates the need for manual reduction; and grade IV hemorrhoids are those that cannot be reduced, including thrombosed and incarcerated hemorrhoids.

The anal cushion sliding process is the most widely accepted theory to explain the occurrence of hemorrhoids and is the most crucial pathophysiological feature of this disease. Increasingly congested, enlarged anal cushions transform into hemorrhoids as they lose their muscular and fibrous fixation, subsequently prolapsing through the anal canal. The prolapsed hemorrhoids are trapped in the narrow anal canal, resulting in strangulation and incarceration, along with increasing anal pressure, venous obstruction, and aggravating congestion.[2,3] In addition, a chronic increase in intra-abdominal pressure, in combination with the absence of valves within hemorrhoid veins, can limit venous drainage from sinusoids during defecation, resulting in abnormal dilatation of the arteriolar-venular anastomoses of the internal hemorrhoidal plexus.[4,5]

Constipation and prolonged straining are considered the primary risk factors of hemorrhoidal disease development.[6] Other factors that cause an excessive increase in intraabdominal pressure, including an erect posture, straining during defecation,[7] excessive time spent on the toilet,[8] and strenuous lifting,[7] are also believed to be associated with hemorrhoid disease. Some reports have suggested that diarrhea is another risk factor for the development of hemorrhoids.[9] After investigating a correlation between lifestyle and hemorrhoids, one study identified a higher incidence of hemorrhoids among individuals whose jobs involved either heavy lifting or a sedentary lifestyle.[10]

The true prevalence of hemorrhoids remains unclear. Symptomatic hemorrhoids are estimated to exist in 4.4% of the general population, with no gender bias, and are primarily diagnosed in individuals between the ages of 45 to 65 years.[11,12] The most common symptom of hemorrhoids is painless anal bleeding during defecation, with or without prolapsing tissue. The invasiveness of treatment varies depending on the degree of symptoms. Treatment options include conservative treatment, including diet changes, sitz baths, and the application of topical ointments.[1,12,13] Among individuals with grade I and II hemorrhoids who reported failure of conservative treatment, most were offered office-based treatment such as rubber-band ligation. For grade III and IV hemorrhoids, surgical intervention is made when required to control the disease.

According to the World Health Organization, "elderly" individuals are defined as those with a chronological age of 65 years or more.[14] Due to its low fertility rate and rising life expectancy, Taiwan will reach the definition of a super-aged society by 2026, where one of five citizens will be aged 65 or older. The elderly have a reduced physiologic reserve and ability to compensate for stress, which gives rise to susceptibility to disability and adverse surgical outcomes, including a higher surgical complication rate, a greater length of hospitalization, a poorer surgical prognosis, and even higher mortality. With recent advancements in medical care, individuals can generally experience a longer life, and, as a result, more surgical procedures are performed in geriatric patients. According to a 50-patient study, operated patients exhibited significant differences in daily life both before and after a hemorrhoidectomy by Ferguson's method. Additionally, pain intensity decreased more than 5.5-fold compared to that before the operation.[15] Although hemorrhoids are not a life-threatening disease, they can represent a challenging problem in achieving equilibrium between a symptomatic relief intervention and the risks due to an increased burden of comorbidities. The decision regarding surgical intervention needs to be weighed with the risks of comorbidities, and, currently, there are no guidelines to aid clinicians in this endeavor.

The purpose of this retrospective observational study was to compare the short-term outcomes of hemorrhoidectomy between elderly and younger patients with hemorrhoid disease, which may help us to clarify the risks associated with an increasingly geriatric population in the face of hemorrhoidectomy. We will further delineate the balance between comorbidities and surgical risks, which is crucial for patient

election to receive this procedure.

Materials and Methods

Between December 2017 and December 2018, a total of 331 patients were diagnosed with grade III or IV hemorrhoids in the Keelung branch of Chang Gung Memorial Hospital, Taiwan. Patients who underwent rubber band ligation (n = 12) and other additional anorectal surgeries, including anal fistula (n = 16), anal ulcer (n = 1), external skin tags (n = 1), and condyloma (n = 1), were excluded from the study. The remaining 300 patients were included. Two of these 300 patients had no medical record of post-operative follow up after discharged. These cases were not excluded as it accounted for a tiny proportion of our enrolled cases which had minor impact to our result. According to the WHO definition of "elderly," 47 patients belonged to the elderly group ($\geq$ 65 years old), and the remaining 253 (< 65 years old) patients belonged to the younger group (Fig. 1).

All 300 patients underwent conventional preoperative preparation and pre-anesthesia evaluation. Before the operation, our surgeons would explain to the patients about the operative indication, methods, expenses, risks, benefit, and post-operative care protocol. The energy devices, like LigaSure^{TM} is a self-paid and single-use device, and it would be used after patients' agreement. For patients taking anti-coagulants, were withdrawal 5 to 7 days before operation and resumed 24 to 48 hours after operation. The anti-platelet agents, like aspirin would be taken during the hospitalization. Surgical procedures were performed by three skilled and experienced operators, and the extent of the operation was dependent on the grading of the hemorrhoids. The operative procedures were as follows: All patients were placed in the Sims position under mask-induced general anesthesia. Under digital exam followed by anoscopy, a mix of lidocaine and adrenaline (10,000:1) was subsequently injected to achieve further local regional anesthetic control and mucosal dissection. And the hemorrhoid complexes which should be excised is clearly defined. Subsequently, the Fergusons procedure was performed under

suitable conditions. During which a skin incision was made on the mucocutaneous border, the hemorrhoids were elevated off the underlying sphincter muscle fibers, and excised with scissors or electrocautery. The procedure allowed excision the hemorrhoid complexes without injury to the underlying sphincter muscle. If the patients choose the energy devices for hemorrhoidectomy, the excision and dissection with LigaSure^{TM} was done in the same fashion. After adequate hemostasis, the apex of the hemorrhoid pedicle was suture-ligated, and the wound in the mucosa and skin was closed with 4–0 Polysorb^{TM}. Additional bupivacaine was administered after all procedures. After the operation, additional intravenous fluid was discontinued when waking up from anesthesia, 1000 mg mefenamic acid with 250 mg magnesium oxide was administered four times a day, and a sitz bath and wound care with neomycin were performed twice a day as post-operative care protocol. Morphine (5 mg) was administered via intramuscular injection every 6 hours if the patient could not tolerate the wound pain. All patients were discharged on postoperative days 1 to 3 with smooth urination.

The patients' clinical characteristics were obtained from patients' medical records, including age, sex, American Society of Anesthesiologists (ASA) classification, Eastern Cooperative Oncology Group (ECOG) performance status, body mass index (BMI), smoking behavior, and comorbidities (Table 1). Hemorrhoid-related clinical characteristics, including symptoms, risk factors, grading, and number of piles are displayed in Table 2. The perioperative data and short-term outcomes, including length of hospital stay, frequency of postoperative outpatient follow-up, operative time,
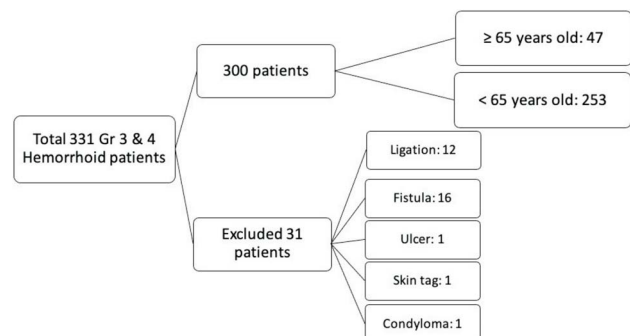

Fig. 1. Flowchart of patient collection.

Table 1. General characteristics according to age grouping

Demographic characteristics	All patients	< 65 years old	≥ 65 years old	p value
Patient number (%)	300 (100)	253 (84.3)	47 (15.7)	
Age	49.81 ± 14.29	45.64 ± 11.07	72.30 ± 6.58	< 0.001*
Gender				0.64
Male	151 (50.3)	129 (51.0)	22 (46.8)	
Female	149 (49.7)	124 (49.0)	25 (53.2)	
ASA				< 0.001*
1	172 (57.3)	165 (65.2)	7 (14.9)	
2	111 (37.0)	80 (31.6)	31 (65.9)	
3	17 (5.7)	8 (3.2)	9 (19.1)	
ECOG				< 0.001*
0	278 (92.7)	243 (96.0)	35 (74.5)	
1	20 (6.7)	10 (4.0)	10 (21.3)	
2	2 (0.6)	0 (0.0)	2 (4.3)	
BMI	24.20 ± 3.94	24.28 ± 0.49	24.33 ± 1.33	0.94
Smoking	48 (16)	42 (16.6)	6 (12.8)	0.51
Comobidities	83 (27.7)	53 (20.9)	30 (63.8)	0.07
Hypertension	59 (19.7)	33 (13)	26 (55.3)	< 0.001*
Diabetes mellitus	18 (6)	10 (4)	8 (17.0)	0.001*
Hyperlipidemia	19 (6.3)	10 (4)	9 (19.1)	< 0.001*
Coronary artery disease	12 (4)	6 (2.4)	6 (12.8)	0.001*
Benign prostatic hyperplasia	4 (1.3)	1 (0.4)	3 (6.4)	0.013
Cerebrovascular accident	4 (1.3)	2 (0.8)	2 (4.3)	0.117
Pulmonary disease	5 (1.7)	1 (0.4)	4 (8.5)	0.002

p value was determined by chi-square test and student T test for multiple comparisons.

Table 2. General characteristics of hemorrhoids according to age grouping

Demographic characteristics	All patients	< 65 years old	≥ 65 years old	p value
Patient number (%)	300 (100)	253 (84.3)	47 (15.7)	
Symptoms				
Prolapse	175 (58.3)	145 (57.3)	30 (63.8)	0.41
Pain	150 (50.0)	126 (49.8)	24 (51.0)	0.87
Bleeding	241 (80.3)	201 (79.4)	40 (85.1)	0.37
Swelling	42 (14)	38 (15.0)	4 (8.5)	0.24
Itching	15 (5)	12 (4.7)	3 (6.4)	0.64
Risk factors				
Prolonged straining	151 (50.3)	127 (50.1)	24 (51)	0.91
Chronic diarrhea	42 (14)	31 (12.3)	11 (23.4)	0.04*
Days for 1 BM	40 (13.3)	1.45 ± 0.11	1.48 ± 0.26	0.78
Occupation	64 (21.3)	58 (22.9)	6 (12.8)	0.12
Grading				0.70
3	13 (4.3)	12 (4.7)	1 (2.1)	
4	287 (95.7)	241 (95.3)	46 (97.9)	
No. of hemorrhoid piles				0.26
1	21 (7)	21 (8.3)	0 (0.0)	
2	104 (34.7)	83 (32.8)	21 (44.7)	
3	148 (49.3)	127 (50.2)	21 (44.7)	
4	25 (8.3)	20 (7.9)	5 (10.6)	
5	2 (0.67)	2 (0.8)	0 (0.0)	

p value was determined by chi-square test and student T test for multiple comparisons.

operative method, and postoperative complications, are displayed in Table 3. All patients were categorized into two groups according to age: < 65 years and ≥ 65 years.

The endpoint was short term outcome, including postoperative morbidity or mortality, operative time, operative blood loss, duration of hospital stays after surgery. The postoperative morbidity included the surgical related complications which are defined as follows: Acute urinary retention was defined that inability to voluntarily pass urine during the hospitalization; bleeding which required blood transfusion or surgical intervention was defined as rebleeding; admission day longer than 4 days (preoperative day included) are classified as prolonged hospital day based on Tw-DRGs (Taiwan version of Diagnosis Related Groups) payment policy; readmission referred to patient unplanned admission within 30 days related to the hemorrhoid surgery; stool impaction indicated that difficult defecation and required rectal irrigation during the hospitalization or outpatient follow-up period; recurrent hemorrhoids are the same pile of hemorrhoids with regrown after surgery in 5 years.

Statistical analyses were performed using the Statistical Package for the Social Sciences version 22 (SPSS Inc. Chicago, USA). For categorical variables, data are presented as frequencies and percentages, and the chi-square test was applied to evaluate the signifi-

cance of differences in proportions. Continuous variables are shown as the mean ± standard deviation (SD) and were estimated using Student's t-test. Finally, binary logistic regression analysis was used to calculate the odds ratios (ORs) for potential risk factors of short-term complications. Covariates were selected based on the literature and entered into the multivariable model when deemed statistically relevant via univariable analysis. All statistical differences were considered significant at $p < 0.05$.

Results

The clinical characteristics of the 300 patients with hemorrhoids are presented in Table 1. These included 253 patients aged < 65 years and 47 patients aged 65 years or older. Equivalent sex ratios were observed in both groups. The elderly group (≥ 65 years old) had a higher ASA and ECOG status. The BMIs of the elderly and younger groups were comparable. We found significantly greater rates of comorbidities in the elderly group, including hypertension ($p < 0.001$), diabetes mellitus ($p < 0.001$), hyperlipidemia ($p < 0.001$), coronary artery disease ($p < 0.001$), benign prostatic hyperplasia ($p = 0.013$), and pulmonary disease ($p = 0.002$).

The patients' hemorrhoid-related clinical charac-

Table 3. Operative data and short-term outcomes according to age grouping

Demographic characteristics	All patients	< 65 years old	≥ 65 years old	p value
Patient number (%)	300 (100)	253 (84)	47 (16)	
Method				0.90
Classical	226 (75.3)	191 (75.5)	35 (74.5)	
LigaSure™	74 (24.6)	62 (24.5)	12 (25.5)	
Duration of hospital stay (days)	3.13 ± 1.69	3.13 ± 0.2	3.11 ± 0.54	0.92
Operation time (mins)	35.58 ± 10.22	35.55 ± 1.27	35.70 ± 2.86	0.93
Prolong hospital day	40 (13.3)	34 (13.5)	6 (12.8)	0.55
No. of OPD follow up (times)	2.63 ± 1.14	2.63 ± 0.14	2.60 ± 0.13	0.84
Unplanned OPD follow up	5 (1.7)	5 (2)	0 (0)	0.33
Complication	58 (19.3)	53 (20.9)	5 (10.6)	0.11
Acute urine retention	40 (13.3)	37 (14.6)	3 (6.4)	0.16
Rebleeding	9 (3.0)	7 (2.8)	2 (4.3)	0.36
Readmission	9 (3.0)	7 (2.8)	2 (4.3)	0.36
Recurrent	2 (0.67)	2 (0.8)	0 (0)	0.71
Stool impaction	8 (2.7)	7 (2.8)	1 (2.1)	0.64

p value was determined by chi-square test and student T test for multiple comparisons.

teristics are shown in Table 2; anal bleeding, prolapse, and pain were the three most common symptoms in both the old and young groups. In terms of the pathogenic factors of hemorrhoids, a higher rate of frequent bowel movement was recorded in the old group (12.3% and 23.4%, respectively, $p = 0.04$). However, a similar presentation of prolonged straining and constipation was observed in both groups. The numbers of hemorrhoid piles in both groups showed no significant difference ($p = 0.26$), with two and three hemorrhoid piles being seen most often. The majority of patients in the two groups suffered from grade 4 hemorrhoids (95.3% and 97.9%, respectively, $p = 0.7$).

After analyzing the perioperative factors (Table 3), a total of 74 (24.6%) patients underwent LigaSure[TM] assisted hemorrhoidectomy. For all patients, the average operation time was 35.58 ± 10.22 mins, length of hospital stay was 3.13 ± 1.69 days, and post-operative OPD visit was 2.63 ± 1.14. There were no significant differences in operation time, length of hospital stay, and postoperative OPD visit between the elderly and younger groups. Forty out of 300 patients with prolonged hospital days were recorded, with a similar prevalence of 13.5% in the elderly group and 12.8% in the younger group ($p = 0.55$). The main causes of delayed discharge were acute urine retention and stool impaction, and there were no specific differences between the groups. All five patients with unplanned frequent OPD visits were noted in the younger group, with an average of 8.2 times. Among them, two patients suffered from intermittent anal bleeding, and the remaining patients suffered from recurrent anal prolapse, delayed wound healing, and perianal abscess. A total of 9 patients suffered from anal bleeding and required re-admission for further care, but the prevalence in the elderly group (4.3%) and younger group (2.8%) was not statistically different ($p = 0.36$).

Furthermore, the total postoperative complication rate in our study was 19.3%. However, notably, all complications recorded in our study were graded as either grade I or II according to the Clavien-Dindo classification of surgical complications. We also explored the risk factors associated with post-hemorrhoidectomy complications. After multivariable analysis with binary logistic regression, we revealed

that sex (male) (OR = 1.99 [95% CI, 1.08-3.70]; $p = 0.03$) and operation time (OR = 1.06 [95% CI, 1.03-1.09]; $p = 0.01$) were independent risk factors associated with the complications of hemorrhoidectomy. We also found that older age (OR = 2.22 [95% CI, 0.84-5.90]; $p = 0.11$) was not a risk factor for hemorrhoidectomy. LigaSure[TM]-assisted hemorrhoidectomy (OR = 0.51 [95% CI, 0.27-0.97]; $p = 0.04$) was an independent beneficial factor that could reduce the incidence of complications (Table 4).

Discussion

Hemorrhoids are not life-threatening; however, they present a challenge in striking a balance between patients' hope for curative intervention and improved quality of life and the risks posed by an increased burden of comorbidities and frailty. In our study, we demonstrated that radical surgical treatment of hemorrhoids was equally safe in old and young people. In our cohort, the operation time, length of hospital stays, outpatient clinic follow-up duration, and percentage of patients with complications were similar between the elderly and younger groups. The grading of hemorrhoids and the number of hemorrhoidal piles had a significant impact on operation time and hospital stay. Higher grading of hemorrhoids and numbers of hemorrhoidal piles resulted in a longer operation time and longer length of hospital stay.

The incidence rates of complications after surgical hemorrhoidectomy varied from 6.3% to 38% in previous studies.[16-18] The most common complications are acute urinary retention, postoperative bleeding, unhealed wounds, stool impaction, and hemorrhoid recurrence,[11,19,20] all of which are considered minor complications. Acute urinary retention has been reported to occur in up to 15% of cases and is the most common reason for a failed discharging plan.[20] Acute urine retention is defined as the need for catheterization within 24 hours after surgery. In our study, 40 patients (13.3%) suffered from acute urinary retention, requiring a longer hospital stay compared to non-acute urinary retention patients (4.2 days vs. 2.97 days, $p < 0.01$). The incidence of acute urinary retention was

Table 4. Univariate and multivariate analysis of risk factors for postoperative complications

Variables	Univariate analysis		Multivariate analysis	
	Odd ratio (95% CI)	*p* value	Odd ratio (95% CI)	*p* value
Age ≥ 65	2.22 (0.84-5.90)	0.11		
Sex (M vs. F)	1.98 (1.09-3.58)	0.02*	1.99 (1.08-3.70)	0.03*
ASA (1 vs. 2 vs. 3)	1.33 (0.84-2.10)	0.23		
Smoking	1.12 (0.52-2.40)	0.77		
BMI ≥ (kg/m^2)	2.19 (0.93-5.14)	0.07		
Hypertension	1.23 (0.61-2.47)	0.56		
Diabetes mellitus	1.66 (0.57-4.86)	0.35		
Hyperlipidemia	2.11 (0.46-9.43)	0.33		
Benign prostatic hyperplasia	1.40 (0.14-13.69)	0.77		
Coronary artery disease	0.83 (0.18-3.89)	0.81		
Cerebrovascular accident	1.40 (0.14-13.69)	0.77		
Pulmonary disease	2.85 (0.46-17.43)	0.26		
Operation time	1.06 (1.03-1.10)	< 0.001*	1.06 (1.03-1.09)	0.01*
Hemorrhoid grading (Gr 3 vs. Gr 4)	1.92 (0.57-6.46)	0.29		
No. of piles (1 vs. 2 vs. 3 vs. 4 vs. 5)	1.48 (1.00-2.17)	0.05	1.13 (0.73-1.73)	0.44
LigaSure^{TM}	0.46 (0.25-0.85)	0.01*	0.51 (0.27-0.97)	0.04*

p value was determined by binary logistic regression for univariate and multivariate analyses.

not significantly different (6.4% vs. 14.6%, *p* = 0.16) between the elderly and younger patients, despite the fact that older men had a significantly higher incidence of prostate hypertrophy. The incidence of post-hemorrhoidectomy hemorrhage ranged between 1% and 2% in previous studies.[13,20] In our study, the post-hemorrhoidectomy hemorrhage incidence rate was 3%, but there was no significant difference between elderly and younger patients (4.3% vs. 2.8%, *p* = 0.36). Major surgical complications such as postoperative mortality, cardiac events, respiratory failure, venous thromboembolic events, unplanned re-operation, anal stenosis, and stool incontinence are less common after hemorrhoidectomy and were not observed in our study.

We explored the risk factors for post-hemorrhoidectomy complications. After multivariable analysis with binary logistic regression, we revealed that sex (male) (OR = 2.02 [95% CI, 1.10-3.73]; *p* = 0.02) and operation time (OR = 1.06 [95% CI, 1.03-1.09]; *p* = 0.01) were independent risk factors that could affect the complications of hemorrhoidectomy. We also found that older age (OR = 2.22 [95% CI, 0.84-5.90]; *p* = 0.11) was not a risk factor for hemorrhoidectomy. The operative method using LigaSure[TM]-assisted hemorrhoidectomy (OR = 0.46 [95% CI, 0.24-0.86]; *p* = 0.02) could reduce complications (Table 4).

Similar to other studies, our data also confirmed that old age was not an independent risk factor for post-hemorrhoidectomy complications.[21,22] It is important to emphasize that the safety of hemorrhoidectomy is therefore equal between the elderly and younger groups. As mentioned before, hemorrhoids are not a lethal disease, but they can significantly impact quality of life.[7] Hence, placing a higher value on balancing a symptom-targeted intervention with procedure-related adverse risks is necessary.

Additionally, our study showed that LigaSure[TM]-assisted hemorrhoidectomy is an independent benefit factor that lowers the risk of complications, especially delayed hemorrhage (OR = 0.46 [95% CI, 0.24-0.86]; *p* = 0.02). A retrospective study of 666 patients confirmed our results, showing that LigaSure[TM]-assisted hemorrhoidectomy is a safe procedure that can shorten operative time, reduce blood loss, and decrease postoperative pain.[12,23] However, the major disadvantage of LigaSure[TM]-assisted hemorrhoidectomy is the cost of the device, which is ten times higher than that of electrocautery hemorrhoidectomy.

Several risk factors that can increase the incidence of acute urine retention have been identified; some of these factors, including age, male sex, and type of surgery, are not modifiable.[24-26] On further analyzing the

Table 5. Comparison of the acute urine retention subgroup

Demographic characteristics	All patients	Acute urinary retention	Non-acute urinary retention	*p* value
Patient number (%)	300 (100)	40 (13.3)	260 (86.7)	
Age				0.16
< 65	253 (84.3)	37 (14.6)	216 (85.3)	
≥ 65	47 (15.7)	3 (6.3)	44 (93.6)	
Gender				0.026*
Male	151 (50.3)	27 (17.9)	124 (82.1)	
Female	149 (49.7)	13 (8.7)	136 (91.2)	
Duration of hospital stay (days)	3.13 ± 1.69	4.20 ± 1.34	2.97 ± 1.68	< 0.001*
Operation time (mins)	35.58 ± 10.22	39.88 ± 10.05	34.92 ± 10.10	0.04*

p value was determined by chi-square test and student T test for multiple comparisons.

cause of acute urinary retention (Table 5), male patients were found to have a higher incidence compared to female patients (17.9% vs. 8.6%, $p = 0.026$). However, a higher prevalence of acute urine retention was observed in younger patients than in older patients (14.6% vs. 6.3%, $p = 0.16$). Only one patient with BPH developed acute urine retention. The operation time was significantly longer in patients who developed acute urine retention (39.88 ± 10.0 min vs. 34.92 ± 10.10 min, $p = 0.004$). It is known that higher grading of hemorrhoids and numbers of hemorrhoidal piles operated on result in a longer operation time and increased postoperative pain.[26] Prolonged operative time may therefore be representative of severe hemorrhoid disease and postoperative pain. This may explain why postoperative pain is a major factor affecting acute urine retention compared to benign prostate hypertrophy.

This study has several limitations. Firstly, this study was a retrospective study conducted in a single institute with a small and uneven sample size. Although sufficient for younger patients, we should also consider that the low number of elderly patients could have limited the evaluation of confounding factors such as adverse events. Moreover, due to the lack of detailed data on the pain score, we were not able to analyze the relationship between postoperative pain and treatment results, especially adverse events. Further large-scale multicenter randomized trials should be conducted to verify our results.

Conclusion

Our study confirms that age alone is not an inde-

pendent risk factor for patients undergoing hemorrhoidectomy. However, other factors, including male sex and a longer operation time, may increase the risk of higher postoperative complications. However, further large-scale cohort studies are required to validate our findings.

Conflicts of Interest

The authors state that there were no conflicts of interest in any step of this study.

References

1. Wald A, Bharucha AE, Cosman BC, Whitehead WE. ACG clinical guideline: management of benign anorectal disorders. *Am J Gastroenterol* 2014;109(8):1141-57, (Quiz) 1058.
2. Jacobs D. Clinical practice. Hemorrhoids. *N Engl J Med* 2014; 371(10):944-51.
3. Hardy A, Cohen CR. The acute management of haemorrhoids. *Ann R Coll Surg Engl* 2014;96(7):508-11.
4. Ganz RA. The evaluation and treatment of hemorrhoids: a guide for the gastroenterologist. *Clin Gastroenterol Hepatol* 2013;11(6):593-603.
5. Fox A, Tietze PH, Ramakrishnan K. Anorectal conditions: hemorrhoids. *FP Essent* 2014;419:11-9.
6. Loder PB, Kamm MA, Nicholls RJ, Phillips RK. Haemorrhoids: pathology, pathophysiology and aetiology. *Br J Surg* 1994;81(7):946-54.
7. Sun Z, Migaly J. Review of hemorrhoid disease: presentation and management. *Clin Colon Rectal Surg* 2016;29(1):22-9.
8. Hall JF. Modern management of hemorrhoidal disease. *Gastroenterol Clin North Am* 2013;42(4):759-72.
9. Johanson JF, Sonnenberg A. Constipation is not a risk factor for hemorrhoids: a case-control study of potential etiological agents. *Am J Gastroenterol* 1994;89(11):1981-6.

10. Khan RM, Malik I, Ansari AH, Zulkifle M, Ehtisham. A study on associated risk factors of haemorrhoids. *Journal of Biological & Scientific Opinion* 2015;3(1):36-8.

11. Mott T, Latimer K, Edwards C. Hemorrhoids: diagnosis and treatment options. *Am Fam Physician* 2018;97(3):172-9.

12. Yamana T. Japanese practice guidelines for anal disorders I. Hemorrhoids. *J Anus Rectum Colon* 2017;1(3):89-99.

13. Davis BR, Lee-Kong SA, Migaly J, Feingold DL, Steele SR. The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the management of hemorrhoids. *Dis Colon Rectum* 2018;61(3):284-92.

14. Definition of an older or elderly person. [https://www.who.int/healthinfo/survey/ageingdefnolder/en/].

15. Szyca R, Leksowski K. Assessment of patients' quality of life after haemorrhoidectomy using the LigaSure device. *Videosurgery and Other Miniinvasive Techniques* 2015;1:68-72.

16. Ho YH, Buettner PG. Open compared with closed haemorrhoidectomy: meta-analysis of randomized controlled trials. *Techniques in Coloproctology* 2007;11(2):135.

17. Jóhannsson HO, Påhlman L, Graf W. Randomized clinical trial of the effects on anal function of Milligan-Morgan versus Ferguson haemorrhoidectomy. *Br J Surg* 2006;93(10):1208-14.

18. Uba AF, Obekpa PO, Ardill W. Open versus closed haemorrhoidectomy. *Niger Postgrad Med J* 2004;11(2):79-83.

19. Bhatti MI, Sajid MS, Baig MK. Milligan-Morgan (open) versus Ferguson haemorrhoidectomy (closed): a systematic review and meta-analysis of Published Randomized, Controlled Trials. *World J Surg* 2016;40(6):1509-19.

20. Kunitake H, Poylin V. Complications following anorectal surgery. *Clin Colon Rectal Surg* 2016;29(1):14-21.

21. Eberspacher C, Mascagni D, Antypas P, Grimaldi G, Fralleone L, Pontone S, Sorrenti S, Pironi D. External hemorrhoidal thrombosis in the elderly patients: conservative and surgical management. *Minerva Chir* 2020;75(2):117-20.

22. Yamamoto M, Ikeda M, Matsumoto T, Takemoto M, Sumimoto R, Kobayashi T, Ohdan H. Hemorrhoidectomy for elderly patients aged 75 years or more, before and after studies. *Ann Med Surg (Lond)* 2020;55:88-92.

23. Chen CW, Lai CW, Chang YJ, Chen CM, Hsiao KH. Results of 666 consecutive patients treated with LigaSure hemorrhoidectomy for symptomatic prolapsed hemorrhoids with a minimum follow-up of 2 years. *Surgery* 2013;153(2):211-8.

24. Baldini G, Bagry H, Aprikian A, Carli F. Postoperative urinary retention: anesthetic and perioperative considerations. *Anesthesiology* 2009;110(5):1139-57.

25. Sutherland LM, Burchard AK, Matsuda K, Sweeney JL, Bokey EL, Childs PA, Roberts AK, Waxman BP, Maddern GJ. A systematic review of stapled hemorrhoidectomy. *Arch Surg* 2002;137(12):1395-406; discussion 1407.

26. Toyonaga T, Matsushima M, Sogawa N, Jiang SF, Matsumura N, Shimojima Y, Tanaka Y, Suzuki K, Masuda J, Tanaka M. Postoperative urinary retention after surgery for benign anorectal disease: potential risk factors and strategy for prevention. *Int J Colorectal Dis* 2006;21(7):676-82.

<u>原　　著</u>

高齡對痔瘡切除手術患者術後結果的影響

黃傳祈　曾文科　范仲維　游彥麟

長庚紀念醫院　基隆分院　肛門直腸科

目的　痔瘡不是威脅生命的疾病，但痔瘡切除手術可以在適當的患者顯著改善生活品質。隨著社會的老齡化，需要接受痔瘡切除術治療的老年患者數量逐漸增加。老年人決定是否接受手術治療時需要權衡其身體狀況以及合併症的風險，而對於年齡的評估並沒有明確的準則讓我們可以在臨床上遵循。我們的研究比較了老年患者和年輕患者接受痔瘡切除術後的成效，從而明確的評估老年人面對痔瘡手術時可能增加的風險。

方法　我們納入所有 2017 年 12 月至 2018 年 12 月於基隆長庚醫院接受痔瘡切除手術的 300 名患者進行評估。收集病歷資料包括病人性別、年齡、痔瘡分級、共病性、生理狀態分級、手術方式、住院天數、門診回診次數。評估其手術預後與年齡直接的相關性。

結果　我們的研究顯示接受痔瘡手術的老年人和年輕人兩組病人間的手術時間、住院時間、門診回診次數以及併發症的百分比並無明顯差異性。經過多變量分析後確定男性及較長的手術時間是術後發生併發症的獨立危險因子。而使用雷加射刀輔助痔瘡切除手術則可以減少併發症的發生。

結論　我們的研究證實，年齡並不是痔瘡切除術手術併發症的獨立危險因素。但性別和更長的手術時間可能會增加術後併發症的風險。

關鍵詞　痔瘡、痔瘡手術、老年、雷加射刀、併發症。