Original Article

Emergency or Urgent Hemorrhoidectomy in Patients with Grade IV Hemorrhoid

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Objective: Grade IV hemorrhoid is not uncommon in surgical practice. When making a decision to operate, the physician needs to estimate the size of the hemorrhoidal head to be cut and distinguish it from the surrounding anoderm remnant. The present study compared the results of operations performed in emergency situations (not later than 6 hours after admission) with those conducted in urgent scenarios (more than 6 hours subsequent to admission).

Materials and Methods: This retrospective study was conducted between January 2007 and December 2015. Inclusion criteria were patients who were diagnosed with grade IV hemorrhoid and underwent surgery and follow-up at Rajavithi Hospital. The exclusion criteria were patients who: (1) refused or were unfit for surgery; (2) were lost to follow-up; (3) had undergone other anal operations; (4) had underlying bowel disease such as Crohn's disease, ulcerative colitis or anal cancer; and (5) were immunocompromised.

Results: A total 180 patients with grade IV hemorrhoid were included. Their average age was 43.93±12.68 years (16 to 82), their BMI was 23.45±2.82 kg/m^2 (16.8 to 32.3), and their median time to presentation after onset of pain was 2 days (1 to 7 days). The average time to operation was 7.42±2.85 hours (1 to 24 hours), median number of hemorrhoid heads excised was 2 (1 to 5) and the average operative time was 69.56±19.19 (45 to 150) minutes. Comparative analysis between the emergency and urgent patients showed that patients in the latter group had fewer hemorrhoid head excisions, and that their operative time, intra-operative fluid and postoperative complications were statistically significantly lower than those in the emergency group.

Conclusion: Hemorrhoidectomy in grade IV hemorrhoid is safe and its outcomes are comparable to those of surgery performed in elective settings.

Keywords: Hemorrhoid, Grade IV, Hemorrhoidectomy, Emergency

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Crises in hemorrhoid treatment are not uncommon in practice. Patients can present with bleeding per anus, itching, wet anus and mass. Those presenting with mass can be affected by a variety of problems including thrombosed, prolapsed or strangulated hemorrhoid. The management technique recommended for grade IV hemorrhoid is hemorrhoidectomy[1,2]; however, this modality has been found to cause complications such as urinary retention in 14.0% of cases, early post-operative wound dehiscence in 1.7% of patients, and incidences of 5.9% and 4.4% respectively of anal stricture and incontinence in the late post-operative phase[3,4]. Choosing the time to operation is also difficult due to many factors such as patient underlying disease, anesthetic method, and number of hemorrhoid excisions required. This study aimed to determine the optimum time to operation in this situation. Figure 1 shows variation of grade IV hemorrhoid.

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Figure. 1 Variation of grade IV hemorrhoid.

Materials and Methods

This was a retrospective study conducted from January 2007 to December 2015. Inclusion criteria were all patients diagnosed with grade IV hemorrhoid who underwent surgery and followed-up at Rajavithi Hospital. Exclusion criteria were patients who: (1) refused or were unfit for surgery; (2) did not come to follow-up; (3) had undergone other anal operations; (4) had underlying bowel disease such

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as Crohn's disease, ulcerative colitis or anal cancer; or (5) were immunocompromised. In the preoperative period, all patients underwent hemorrhoid reduction, warm sitz bath and intramuscular diclofenac injection.

Patients in the emergency group underwent surgery immediately after admission or within 6 hours while those in the urgent group had their operations after correction of underlying medical disease or later than 6 hours after admission. All patients were treated with hemorrhoidectomy under spinal anesthesia using the closed technique with Fansler's retractor. Hemorrhoids were excised with scissors and diathermy to preserve the intervening anoderm bridge. The pedicle was controlled with suture transfix using 3/0 polygactin. The wound was closed with 3/0 polygactin in a continuous pattern.

In the postoperative period, all patients were prescribed oral metronidazole 400 mg tid for 1 week. Pain was controlled with acetaminophen 500 mg, 2 tabs every 6 hours, around the clock for the first 24 hours postoperatively, and then as per request. Diclofenac 25 mg was prescribed 1 tab three times a day for 1 week, together with pethidine 25 mg intravenously per request every 4 to 6 hours for the first 24 hours.

Clinical data in the postoperative phase were collected relating to immediate complications, pain score, analgesic used, first bowel movement, and continence status. Patients were discharged when they were able to pass stools. A follow-up schedule was set for 2, 6, and 10 weeks, and then 3 months postoperatively to assess wound, clinical symptoms, continence status, and detect late complication The present study protocol was reviewed and approved by the Institutional Review Board of Rajavithi Hospital (042/2018).

Statistical analysis

All analyses were performed with IBM SPSS Statistic Version 22.0. Data were presented as mean, standard deviation (SD) for continuous variables, and number (%) for categorical variables. Comparison was made of continuous and categorical variables in two groups using student t-test and Chi-square test, respectively. A *p*-value of less than 0.05 was set as statistically significant in all tests.

Results

Of the 185 patients with grade IV hemorrhoid, 5 were excluded: one had underlying ulcerative colitis; another was misdiagnosed with thrombosed external hemorrhoid; a third patient had underlying HIV; and a further two were lost to follow-up. Of the remaining 180 patients, 81 were male, and 99 were female. All patients underwent closed hemorrhoidectomy with electro-cautery. The mean age was 43.93±12.68 years (16 to 82); mean BMI was 23.45±2.82 kg/m^2 (16.8 to 32.3); the mean time to presentation after onset of pain was 2.11±1.05 days; and the median time to presentation after onset of pain was 2 days (1 to 7 days). Demographic data are shown in Table 1. The average time to operation was 7.42±2.85 hours (1 to 24 hours); the mean number of hemorrhoidal heads excised was 1.85±0.82; the median number of hemorrhoid heads excised was 2 (1 to 5); and the mean operative time was 69.56±19.19 (45 to 150) minutes as shown in Table 2.

Table 1. Demographic data of patients with hemorrhoidectomy within 6 hours and more than 6 hours

Demographic factors	Time to operation		*p*-value
	≤6 hrs	>6 hrs	
Age group			0.681
<60	53 (89.8)	100 (87.7)	
≥60	6 (10.2)	14 (12.3)	
Sex			0.273
Male	30 (50.8)	48 (42.1)	
Female	29 (49.2)	66 (57.9)	
History of laxative use	22 (37.3)	32 (28.1)	0.215
History previous treatment			0.505
None	46 (78)	97 (85.1)	
Rubber band	9 (15.3)	10 (8.8)	
Sclerosing	0 (0.0)	2 (1.8)	
Surgery	4 (6.8)	3 (2.6)	
Alternative medicine	0 (0.0)	2 (1.8)	
Time to hospital (days) (mean ± SD)	2.01±1.09	2.13±1.04	0.499
Group of time to hospital			0.729
<3 days	40 (72.7)	82 (75.2)	
≥3 days	15 (27.3)	27 (24.8)	
ASA classification			0.394
1	49 (83.1)	89 (75.4)	
2	9 (15.3)	28 (24.6)	
3	1 (1.7)	0 (0.00)	

Values are represented as n(%), mean ± SD, * = significant at $p<0.05$

In the postoperative period, the mean pain scores at 8 hours and 24 hours were 7.23±1.9 (2 to 10) and 6.42±1.9 (0 to 10), respectively. The mean quantity of additional acetaminophen administered after 24 hours was 1,345±940 mg (0 to 5,000), and the average dose of pethidine used in 24 hours was 112.28±23.49 mg (50 to 200). Early postoperative complications found included urinary retention in 7 patients (3.0%), postoperative bleeding in 11 patients (6.1%) and reprolapse or thrombosis in 10 patients (5.6%). Postoperative data are shown in Table 3.

Comparative analysis of the emergency and urgent cases showed that the number of hemorrhoid head excisions, operative times, intra-operative fluid and postoperative complications were significantly different between the two groups.

During the follow-up period, wound dehiscence was found in 38 patients (21.1%) as shown in Figure 2. There was no incidence of anal stenosis or incontinence, and median Wexner's score was zero (0 to 4) at 3 months postoperatively. There was no significant difference in

Table 2. Intraoperative data of patients with hemorrhoidectomy within 6 hours and more than 6 hours later

Factors	Time to operation		*p*-value
	≤6 hrs	>6 hrs	
Hemorrhoidal heads excised median (min-max)	2 (1 to 5)	2 (1 to 3)	<0.001*
Gr. number excision			
<3 heads	33 (58.9)	94 (86.2)	<0.001*
≥3 heads	23 (41.1)	15 (13.8)	
Intraoperative fluid infusion (ml)	767.04±589.04	351.54±145.67	<0.001*
Operative time (minutes)	73.72±21.08	67.63±18.03	0.023*

Values are represented as n (%), mean ± SD, * = significant at $p<0.05$

Table 3. Postoperative data of patients with hemorrhoidectomy within 6 hours and after more than 6 hours

Factors	Time to operation		*p*-value
	≤6 hrs	>6 hrs	
Pain score at 8 hours	7.27±1.93	7.22±1.90	0.889
Pain score at 24 hours	6.79±1.75	6.27±1.75	0.055
Dose of pethidine usage in 24 hours (mg) (mean ± SD)	110.08±24.02	111.03±23.76	0.808
Dose of additional of usage acetaminophen (mg) (mean ± SD)	1,307.69±1,029.72	1,364.58±904.60	0.729
Overall complications	25 (42.4)	3 (2.6)	<0.001*
Urinary retention	8 (13.6)	0 (0.0)	<0.001*
Postoperative bleeding	10 (16.9)	1 (0.9)	<0.001*
Re-prolapse or thrombosis	7 (11.9)	3 (2.6)	<0.001*
Hospital stay (days) (median (min-max))	1 (1 to 9)	1 (1 to 8)	0.331

Values are represented as n (%), mean ± SD, * = significant at $p<0.05$

Table 4. Late postoperative complication data of hemorrhoidectomy

Factors	Time to operation		*p*-value
	≤6 hrs	>6 hrs	
Wound dehiscence	20 (36.4)	18 (17.6)	<0.001*
Ectropion	2 (4.9)	3 (4.9)	1.000
Clinical continence			
Normal	57 (96.6)	114 (100.0)	0.115
Gas incontinence	2 (3.4)	0 (0.0)	
Wexner's score median (min-max)	0 (0 to 4)	0 (0 to 4)	0.585
Recurrence			
Bleeding	6 (10.2)	6 (5.3)	0.582
Spontaneous reducible	1 (1.7)	2 (1.8)	
Persist lump	1 (1.7)	2 (1.8)	

Values are represented as n (%), mean ± SD, * = significant at $p<0.05$

recurrence of symptoms after 6 months, as shown in Table 4. Distribution of wound dehiscence is displayed in Figure 2.

Discussion

Hemorrhoidectomy is the gold standard treatment for grade III-IV hemorrhoid[5]; however, in cases of grade IV hemorrhoid, it is difficult to decide when to operate because emergency operations have a high incidence of complications such as portal pyaemia, postoperative bleeding, anal stricture, incontinence, and also high recurrence rates[4]. A few reports have shown comparable results in emergency and elective hemorrhoidectomy[6], with severe postoperative bleeding of 2 to 3.6% in emergency cases and 1.2 to 1.5% in elective scenarios, and anal stenosis in 5.9 to 7% and 2%,

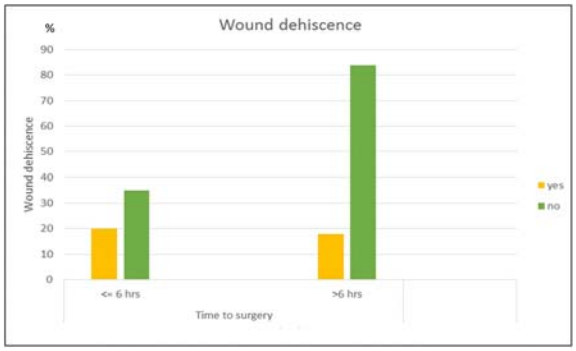

Figure. 2 Distribution of wound dehiscence.

respectively[4,7]. However, in the acute phase the decision about whether to excise a hemorrhoidal head is a difficult one because surrounding tissue edema makes it difficult to determine the size of the hemorrhoidal head and distinguish it from the anoderm remnant. A previous study[3] suggested creating an anoderm flap to prevent anal stenosis without increasing the number of complications; however, creating an anoderm flap is complicated and needs to be performed by an experienced surgeon. Another study suggested limiting hemorrhoidectomy to only the largest head and performing subsequent operations a few week later to minimize the risk of anal stenosis[8]. Another simplified method used is the "open hemorrhoidectomy" or Milligan-Morgan technique[4,7] which does not require subsequent hemorrhoidectomy. A recent study revealed that a combination of stapled hemorrhoidopexy (procedure of prolapse hemorrhoid, PPH) with stab incisions to remove any thrombus, together with anal stretch to reduce tissue edema, did not result in any increase in early postoperative complications and achieved lower pain scores with no symptom recurrence at 1-year follow-up[9]. Fatal complications of PPH have been reported, however, such as intraperitoneal bleeding[10], iatrogenic diverticulum[11], and acute rectal obstruction[12]. Another kind of instrument used in the management of hemorrhoid crisis is a vascular sealing device, which aims to reduce bleeding and operative time, and to preserve the anoderm. Results revealed a short operative time (average 35 minutes), only 5% early postoperative urine retention and just 2.5% skin tag in the late follow-up period[13]. Reduction is a method of mitigating tissue edema because in the pathogenesis of the disease, prolapsed hemorrhoids become trapped by the sphincter outside the anus, leading to obstruction of venous return, edema, reduced arterial flow and strangulation. In this study, patients in the urgent group had fewer hemorrhoid excisions, shorter operative time, and less intra-operative fluid infusion. With regard to the timing of emergency and urgent operations, there has been no clear specification, although one study suggested that they should be performed not later than 24 hours after admission[3]. The present study showed that patients with preoperative preparation of longer than 6 hours suffered fewer complications than those with preparation of shorter than 6 hours. Possible explanations for this could be that the former group had better correction of underlying disease and systemic inflammatory response syndrome (SIRS)[14]. A previous study showed that patients with SIRS had a 27.3% incidence of postoperative complications compared with 0% in those without SIRS[15]. Another study of trauma patients showed that all those who were resuscitated adequately within 24 hours survived; in contrast, only 14.0% of patients survived if poorly resuscitated when high lactate levels did not normalize within 48 hours[16]. This study found that the occurrence of early postoperative complications in the two groups was comparable with those found in elective settings. Urinary retention, at 0% and 13.6% in our study, were reported at 2 to 3.6% in an elective setting while the incidence of bleeding, 0.9 to 16.9% in the present study, was 0.3 to 6% in an elective scenario[17-19]. Between-group comparison showed the urgency (or preparation time longer than 6 hours) group had better results in overall early complications due to better pre-operative preparation, less SIRS[16] and lower tissue edema resulting in better intra-operative field for the operation. In terms of urinary retention, the results of this research were in concordance with those of previous studies which reported that the risk factors were as follows: more than 3 hemorrhoidal heads excised; diabetic mellitus; morphine use; other anal operations; and intraoperative intravenous fluid >1,000 ml[20,21]. A better pre-operative phase helps to minimize vasodilation effects of spinal anesthesia to reduce intra-operative intravenous fluid infusion. Most immediate post-hemorrhoidectomy bleeding is related to operative techniques used to secure the hemorrhoidal stump. Reduction can mitigate tissue edema[22] and also reduce the number of hemorrhoidal heads that need to be excised[23].

The present study found that fewer hemorrhoidal heads were excised in the urgent group where preparation time was longer than 6 hours; the possible reasons for this are reduced edema of the hemorrhoidal head and improved venous blood flow after reduction[22].

In the late follow-up period, the present study showed significantly more wound dehiscence in the emergency group. Tissue edema is one of the risk factors for this complication, as well as tension and infection[22]. With regard to systemic factors, SIRS results in poor wound healing due to the large number of cytokine pathways, tumor necrosis, and limited collagen synthesis[24-26].

Rates of disease recurrence were not significantly different, with 13.5% and 8.77% in the emergency and urgent groups, respectively. Elective setting recurrence after hemorrhoidectomy has been reported at 5.0%, but in some reports, as many as 15.8% of cases[27] have needed medical treatment or office-based procedures. The factors related to recurrence of disease are multiple, and similar to those of pathogenesis, depending on patients' toilet habits, dietary fiber intake, bowel habits and anal tone[28-32].

One limitation of this research is that it was a retrospective study and we were, therefore, unable to collect data about pre-operative preparation periods with objective

measurements such as C-reactive protein or serum lactate of grade IV hemorrhoid in each case.

Conclusion

Hemorrhoidectomy in grade IV hemorrhoid is safe, with outcomes comparable to operations in elective settings in terms of patient stabilization, and hemorrhoid reduction is helpful in lessening local complications.

What is already known in this topic?

1) Emergency hemorrhoidectomy is safe, but fatal complications have been reported.

2) Urgent hemorrhoidectomy is recommended for grade IV hemorrhoid, but during our research, we did not have information regarding pre-operative preparation and bridging time to operation.

What this study adds?

The author showed that simple reduction and urgent hemorrhoidectomy after patients have been stabilized incur a lower number of complications than found in emergency settings.

Potential conflicts of interest

The authors declare no conflict of interest.

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