



Title	Ambulatory stapled haemorrhoidectomy: A safe and feasible surgical technique
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Ambulatory stapled haemorrhoidectomy: a safe and feasible surgical technique

日間手術吻合器痔瘡切除：一種安全及可行的技術

Objective. To compare outcomes following stapled haemorrhoidectomy as an in-patient versus day-surgery procedure.

Design. Prospective non-randomised study.

Setting. University affiliated hospitals, Hong Kong.

Subjects and methods. Forty-eight consecutive patients who underwent stapled haemorrhoidectomy were included in the study. Twenty-four patients had the procedure in an ambulatory setting and the other 24 were treated as in-patients. The symptoms, operative details, postoperative complications, length of hospital stay, pain scores, analgesic requirements, and patient satisfaction scores were collected. Comparison was made between those patients undergoing ambulatory surgery and those treated as in-patients.

Results. There were 25 women and 23 men in the study. The mean age was 46.6 years (standard deviation, 12.1 years). The mean operating time was 29.3 minutes (standard deviation, 9.9 minutes). An incomplete 'doughnut' after stapling was found in one patient. There were no other adverse intra-operative events or complications. Postoperative morbidities occurred in eight patients but none required further surgery. One patient in the day-surgery group could not be discharged because of urinary retention and three required re-admission to hospital because of secondary haemorrhage (n=1) or fever (n=2). There were no differences in the postoperative complications, pain scores, analgesic requirements, and patient satisfaction scores between the two groups. The total mean hospital stay was significantly shorter for those undergoing day-surgery stapled haemorrhoidectomy (0.46 versus 1.9 days, P<0.01). The mean follow-up period was 4.6 months (standard deviation, 4.0 months). All patients reported symptomatic improvement during this time and there was no incidence of faecal incontinence. One patient had a soft stricture, one had a fissure, and two had residual skin tags. All of these problems were conservatively managed, without the need for further surgical procedures.

Conclusions. Stapled haemorrhoidectomy is a safe and effective operation for haemorrhoids. It is a feasible procedure to perform as day-surgery. The hospital stay can be significantly shortened, thus reducing the costs associated with in-patient care.

Key words:

Ambulatory surgical procedures;
 Hemorrhoids;
 Postoperative complications

關鍵詞：

日間外科手術；
 痔；
 術後併發症

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目的：比較住院及日間手術吻合器痔瘡切除手術的結果。

設計：非隨機預期研究。

安排：大學附屬醫院，香港。

對象與方法：本研究包括連續48名吻合器痔瘡切除手術的患者。其中24名患者接受日間手術，其餘24人留院進行手術。收集並比較兩組病人的資料，包括患者的徵狀、手術的詳細資料、術後併發症、住院時間、疼痛程度、患者對止痛的需求及滿意程度。

結果：患者包括25名女性和23名男性，平均年齡為46.6歲(標準差，12.1歲)。平均手術時間為29.3分鐘(標準差，9.9分鐘)。一名患者於吻合器痔瘡切除手術後「環圈」不完整，八名患者出現術後併發症，但他們都無需再進行手術。接受日間手術的患者中，一人因尿滯留不能出院，另三人因出血(n=1)或發燒(n=2)而需再度入院。兩組患者在術後併發症、疼痛程度、對止痛的需求及滿意程度方面均沒有差別。接受日間手術吻合器痔瘡切除手術的患者，他們的總住院時間明顯較短(0.46比1.9天，P<0.01)。平均跟進期為4.6個月(標準差，4.0個月)。研究期間，所有患者的症狀都有改善，並且沒有糞便滯留。一名患者出現軟性狹窄，一名有肛裂，另兩名有剩餘的皮膚垂脫。這些問題作適當處理後，均無需再次進行手術。

結論：吻合器痔瘡切除手術是一種安全有效的手術。日間手術是可行的，這模式大大縮短留院期，從而減低住院所帶來的成本。

Introduction

Haemorrhoidectomy is one of the most commonly performed anorectal operations. It is considered the most effective treatment for third and fourth degree haemorrhoids.¹ Conventional haemorrhoidectomy, either by Milligan-Morgan excision² or by Ferguson's closed technique,³ is an extremely painful procedure, however. Significant postoperative pain and the need for wound care usually mitigate against performing the operation in an ambulatory setting. Moreover, morbidities such as bleeding and urinary retention are not uncommon following conventional haemorrhoidectomy. Recently, stapled haemorrhoidectomy with the use of a circular stapler has been shown in randomised controlled trials to be associated with less postoperative pain and an earlier return to normal activities.^{4,5} Given the decreased postoperative pain and no need for wound care, stapled haemorrhoidectomy should be feasible as a day-surgery procedure. Stapled haemorrhoidectomy was first used by the authors in June 2000 and has since become the preferred surgical technique for ambulatory haemorrhoidectomy. This study reviews the results of stapled haemorrhoidectomy for patients with third or fourth degree haemorrhoids, with reference to its feasibility as a day-surgery procedure.

Subjects and methods

Forty-eight consecutive patients who were to undergo stapled haemorrhoidectomy for third and fourth degree haemorrhoids at the Tung Wah Hospital (TWH) and Queen Mary Hospital were included in the study.

Twenty-four patients had the operation as a day-surgery procedure at TWH, while the other 24 patients were treated as in-patients in both hospitals. All patients had symptomatic third or fourth degree haemorrhoids. Lower gastrointestinal endoscopy was performed to exclude other colorectal lesions for those patients with rectal bleeding that could not be solely attributed to haemorrhoids. Informed consent was obtained from the patients for stapled haemorrhoidectomy after full explanation of the procedure.

For patients undergoing surgery at TWH, assessment of suitability for day surgery was made. Those who were willing to undergo day surgery underwent pre-anaesthetic assessment at the Day Surgery Centre. The medical and social history of each patient was assessed by surgeons, anaesthetists, and specialist nurses before the decision to undergo ambulatory surgery was reached.

The patients scheduled for ambulatory surgery were admitted on the morning of the day of surgery. A Fleet

(CB Fleet Co., Inc., Lynchburg, US) enema was given to evacuate the rectum before the operation. All day-surgery procedures were performed by two surgeons. The patients underwent general anaesthesia with endotracheal intubation. They were placed in the prone Jackknife position and metronidazole 500 mg was given intravenously at induction of anaesthesia.

Stapled haemorrhoidectomy was performed with PPH01 (Ethicon Endosurgery, Cincinnati, US) or CEEA 34 and STRAM-kit (Tyco Healthcare, Norwalk, US). A purse string suture was placed 4 to 5 cm from the dentate line to make the staple line approximately 2 to 3 cm from the dentate line. After the stapler had been deployed, meticulous haemostasis was achieved by plication of the bleeding points at the staple line.

During the postoperative period, intravenous pethidine was given as required, and oral dextropropoxyphene-paracetamol tablets (Dologesic; Synco Ltd, Hong Kong) were also given. The patients were assessed in the afternoon and discharged if there were no complications. The pain score was measured by a scale from zero to 10 (0=no pain, 10=severe pain) and was ascertained by telephone interview during the week following surgery. This interview was completed by a nurse who was not otherwise involved in the care of these patients. Data about the number of doses of parenteral analgesia and the number of tablets of dologesic prescribed were also prospectively collected. Patient satisfaction was assessed using a 5-point scale (1=very satisfactory, 5=very unsatisfactory). Patients were seen for follow-up 2 weeks and 2 and 6 months after surgery.

For patients treated as in-patients, all operations were performed by two surgeons. Spinal anaesthesia was given to some patients, as decided by the anaesthetist and the patient. The operative technique and the postoperative analgesia used were similar to those used for day-surgery patients. Patients were discharged when the pain became tolerable and there were no complications. It was not considered necessary to wait for the first bowel movement before discharge. Data about pain scores, analgesic requirements, and patient satisfaction were collected in a similar manner to those patients undergoing day surgery.

Statistical analysis

All the data were prospectively collected and entered into the Statistical Package for Social Sciences (Windows version 10.0; SPSS Inc., Chicago, US). Nominal variables were analysed with the Chi squared test or Fisher's exact test, as appropriate, and continuous variables were analysed using the Student's *t* test. A P value of less than 0.05 was considered statistically significant.

Table. Comparison between day-surgery patients and in-patients undergoing stapled haemorrhoidectomy

	Day surgery, n=24	In-patients, n=24	P value
Mean age (SD) [years]	47.0 (10.7)	46.1 (13.5)	NS*†
Women:men ratio	15:9	10:14	NS‡
No. of main symptoms			NS‡
Prolapse	15	18	
Bleeding	9	6	
No. of previous treatments	9	5	NS‡
Mean duration (min)	31.4	26.9	NS†
No. of intra-operative complications	0	1	NS‡
No. of additional procedures	3	4	NS‡
Mean hospital stay (SD) [days]	0.5 (1.2)	1.9 (1.1)	<0.01†
No. of parenteral analgesia			NS‡
Yes	7	11	
No	17	13	
Mean no. of oral analgesics consumed	9.6	8.6	NS†
Mean patient satisfaction score (SD)			
At discharge	2.0 (0.7)	1.7 (0.6)	NS†
At 2 weeks	1.4 (0.6)	1.5 (0.7)	NS†
No. of postoperative complications	5	3	NS‡

* NS not significant

† Student's *t* test

‡ Fisher's exact test

Results

During the study period from June 2000 to February 2002, twenty-four patients had stapled haemorrhoidectomy as an ambulatory procedure and 24 had surgery as in-patients. There were 25 women and 23 men. The mean age was 46.6 years (standard deviation [SD], 12.1 years). The age and sex of the day-surgery group and the in-patient group are shown in the Table.

The presenting symptoms were similar in both groups and 68.8% of patients presented with prolapsed haemorrhoids. The mean operating time was 29.2 minutes (SD, 9.9 minutes) and there was no difference between the two groups. Additional procedures were performed for seven patients. These included removal of external skin tags (n=2), excision of fibrous anal polyps (n=2), and fistulotomy (n=1). One patient had an incomplete 'doughnut' after stapling. There were no other complications or adverse events during the surgery. Histological examination of the resected rectal tissues showed that smooth muscle was present in nine of the 48 patients.

Of the 24 patients scheduled to have ambulatory surgery, 23 were discharged the same day. The only patient admitted to hospital had urinary retention, and insertion of a urinary catheter was required.

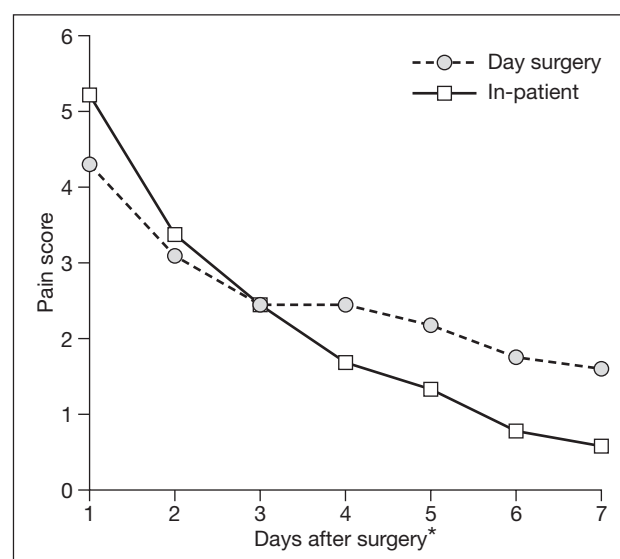
The number of patients requiring parenteral analgesia and the consumption of oral analgesics was similar in the two groups (Table). The Fig shows the pain scores for the two groups. There was no difference in pain scores between the two groups during the first week after surgery.

Complications following surgery occurred for eight patients. These included secondary haemorrhage (n=1), urinary infection (n=1), urinary retention (n=3), urinary urgency (n=2), and fever (n=1). All complications were treated conservatively and no further procedure was required

for their management. Three patients in the day-surgery groups required re-admission to hospital because of complications. These included one patient with secondary haemorrhage on day 7, one with fever without any documented cause, and the other with fever due to a urinary tract infection.

During a mean follow-up period of 4.6 months (SD, 4.0 months), all patients showed symptomatic improvement. No incidence of faecal incontinence was noted. A soft stricture occurred in one patient, requiring digital dilatation once in the clinic. Two patients had residual skin tags, while one had an acute anal fissure that was responsive to conservative treatment. No further procedures were needed during the follow-up period.

The difference in mean total hospital stay is reported in the Table. The mean total hospital stay was significantly



*P>0.05 for all days

Fig. Postoperative pain scores following stapled haemorrhoidectomy

shorter in the day-surgery group with the inclusion of the number of days of hospital stay during re-admission taken into account.

Discussion

Haemorrhoidectomy is the most effective treatment for third and fourth degree haemorrhoids.¹ Conventional haemorrhoidectomy involves excision of the prolapsed haemorrhoids and is usually associated with severe pain. There is a wide variation in practice regarding the hospital stay following conventional haemorrhoidectomy. This depends on economic constraints, the culture of the population, and the home environment of patients. Hospital stay following conventional haemorrhoidectomy can range from a few hours after the operation⁶ to a mean stay of more than 6 days.⁷ Despite ambulatory surgery for conventional haemorrhoidectomy being practised in some centres, many patients prefer to be admitted to hospital if possible.⁸ This possibly reflects concern regarding the management of severe pain, the need for wound care, and the fear of complications following haemorrhoidectomy.

The control of post-haemorrhoidectomy pain has always been the main concern for the surgeon, and tremendous efforts have been made to reduce the pain in order to render haemorrhoidectomy possible as an ambulatory procedure. There have been attempts to modify the surgical technique, such as using diathermy,⁹ a harmonic scalpel,¹⁰ or Ligasure¹¹ (Valleylab, Boulder, US) for the excision of haemorrhoids. Surgical or medical means to reduce the sphincter muscle spasm have also been tried to reduce postoperative pain.¹²⁻¹⁴ Different forms of analgesia and anaesthesia have also been used.^{15,16} Furthermore, postoperative antibiotics to reduce infection have been shown to be effective in reducing postoperative pain.¹⁷ Despite these approaches, the primary cause of pain—the trauma to the pain-sensitive perianal skin and the anal epithelium during excision of haemorrhoids—is still present, and pain reduction is usually limited.

Haemorrhoids are now regarded as cushions of fibrous and vascular tissue at the anal canal that become symptomatic when prolapse occurs.¹⁸ Stapled haemorrhoidectomy, introduced by Longo,¹⁹ involves resection of a ring of tissue containing the mucosa and submucosa of the rectum well above the dentate line, with immediate closure of the defect with the circular stapler. The haemorrhoids are not excised but, by resecting the prolapsed rectal mucosa, the prolapsed haemorrhoids are restored to their normal anatomical position. Thus, stapled haemorrhoidectomy appears to deal with the basic pathophysiology of prolapsed anal cushions.

The absence of a wound and subsequent potential infection at the perianal area helps to reduce postoperative pain following stapled haemorrhoidectomy. Moreover, wound care is not necessary, as the staple line is in the rectum. Several randomised controlled trials have previously shown that pain scores are significantly lower in patients with

stapled haemorrhoidectomy compared with those undergoing conventional haemorrhoidectomy.^{4,5,20,21} Shorter hospital stays as well as a more rapid return to normal activities has also been reported.^{5,20,21} In most randomised trials, however, patients were mainly treated as in-patients rather than in an ambulatory setting.^{5,7} With the significant reduction of postoperative pain achieved and without the need for wound care, stapled haemorrhoidectomy should now be considered feasible as a day-surgery procedure.

This study confirms that stapled haemorrhoidectomy is a safe procedure, without the presence of serious complications. The operating time in this study was longer when compared with other studies. For most patients, the stapling could be finished within 15 minutes. Extra surgical time was used to secure haemostasis by plication of bleeding sites from the staple line, however. Meticulous haemostasis is particularly important for day-surgery patients to avoid primary haemorrhage requiring surgical treatment. In this series, there was no early haemorrhage and only one patient had secondary haemorrhage. This patient was conservatively treated without blood transfusion or further surgery.

Complications following stapled haemorrhoidectomy are mostly urological. Urinary retention is one of the most important reasons for hospital stay and re-admission following haemorrhoidectomy. Urinary retention occurred in 6.3% of patients in this series and no difference was noted between day-surgery and in-patient groups. This rate is relatively low when compared with other series involving conventional haemorrhoidectomy.²² Zaheer et al²² reported urinary retention in 16% of patients following anorectal surgery and 34% of patients following haemorrhoidectomy. These authors suggested that there was a correlation between urinary retention and the degree of pain. With the significant reduction in pain associated with stapled haemorrhoidectomy, the incidence of urinary retention could theoretically be expected to be lower. There have been no previous reports on the impact of stapled haemorrhoidectomy on the incidence of urinary retention however, although, this may be due to the small numbers of patients in most studies to date.

Re-admission to hospital was required for three patients and all were conservatively treated without surgery. Two of the patients were re-admitted because of fever. As there has been a report of severe pelvic sepsis following stapled haemorrhoidectomy,^{23,24} the postoperative fever was treated with caution and the patients were admitted for observation. One patient was subsequently found to have a urinary tract infection, while no obvious cause could be found for the other patient.

In this study, the two groups of patients were not randomly assigned to receive in-patient or day surgery, and selection bias could certainly have influenced some of the outcomes of surgery and the patient satisfaction. The two groups of patients were matched in terms of sex, age,

severity of disease, and the technique of the procedure, however. The study showed that for stapled haemorrhoidectomy, ambulatory surgery is a safe and feasible option. The complications, analgesic requirements, pain scores, and patient satisfaction scores were similar for patients who had day surgery compared with those treated as in-patients. Thus, hospital stay following stapled haemorrhoidectomy does not appear to give further benefits. For those patients undergoing ambulatory surgery, 95.8% could be discharged on the same day, while the re-admission rate was 12.5%. The total hospital stay was significantly shorter for the day-surgery group, even with the inclusion of the days of hospital stay during re-admission.

Conclusion

The practice of stapled haemorrhoidectomy in an ambulatory setting is safe and feasible. As the cost of the stapler is considerable, the practice of ambulatory surgery could certainly reduce the costs associated with this technique. With the reduction of postoperative pain with this method, haemorrhoidectomy has become more acceptable as an ambulatory procedure.

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