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Hypertrophic Anal Papillotomy by Transparent Cap-Assisted Endoscopic Hot Snare Resection

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Abstract

Background/Aim: Conventional treatment for hypertrophic anal papillae (HAP) has effectiveness and safety concerns. This study aimed to investigate the feasibility, safety, and efficacy of transparent cap-assisted endoscopic hot snare resection for the treatment of HAP. Methods: Endoscopic and clinical data of patients treated with transparent cap-assisted endoscopic hot snare resection for HAP at the Department of Gastroenterology, First Affiliated Hospital of Yangtze University from June 2019 to June 2021, were collected and retrospectively analyzed. Results: A total of 56 patients with HAP were treated with transparent cap-assisted endoscopic hot snare resection, including 53 patients (94.6%) with single hypertrophic anal papillae and 3 patients (5.4%) with multiple HAP; 51 patients (83.6%) with basal diameter <5 mm and 10 patients (16.4%) with basal diameter ≥5 mm. The procedures that were performed together with transparent cap-assisted endoscopic hot snare resection for HAP treatment included total colon examination in 56 cases (100%), endoscopic polypectomy in 20 cases (35.7%), endoscopic sclerotherapy for hemorrhoids in 29 cases (51.8%), and endoscopic rubber band ligation for hemorrhoids in 11 cases (19.6%). No patient experienced bleeding during or after HAP with transparent cap-assisted endoscopic hot snare resection. Pain level was evaluated by the visual analog score (VAS) method. 52 patients (92.9%) did not have pain and 4 patients (7.1%) had mild pain 3 days after surgery. At a postoperative follow-up of 2 to 18 months, patient satisfaction with transparent cap-assisted endoscopic hot snare resection for HAP treatment was 100% (56/56). Conclusion: Transparent cap-assisted endoscopic hot snare resection is safe and effective for treating HAP.

Keywords

Hypertrophic Anal Papillae, Transparent Cap-Assisted Endoscopic Hot Snare Resection, Hot Snare, Colonoscopy

1. Introduction

Anal papillae are triangular, yellowish-white, papillary protrusions below the anal flap that can become inflammatory and hypertrophic when stimulated by infection, trauma, and other factors. Hypertrophic Anal Papillae, also known as anal papilloma or anal papillary fibroma, is a relatively common clinical anorectal disease. On one hand, some patients suffer from itching, swelling and discomfort in the anal area due to anal papilloma, and even repeated prolapse of the anal papilla, which affects patients' daily life; on the other hand, although anal papilloma is mostly a benign tumor, related reports show that hypertrophic anal papillae have a tendency to become malignant [1] [2].

Therefore, if the diagnosis has been established, it should be excised as early as possible and examined pathologically to avoid further deterioration of the patient's condition and the possibility of underdiagnoses and misdiagnosis. Conventional external and internal ligation for the treatment of hypertrophic anal papillae may result in dyspareunia, pain during defecation, and slow healing [3]. With the continuous progress of endoscopic technology, some studies have reported that endoscopic excision of hypertrophic anal papillae under transparent cap-assisted endoscopy is safe and effective, with easy manipulation, short treatment time, high patient acceptance, and better prognosis [4] [5] [6]. As a result of endoscopic technology advancement, simultaneous hypertrophic anal papillotomy with transparent cap-assisted endoscopic resection for hemorrhoids was completed, and no bleeding or other complications were observed during the procedure in previous studies [7] [8] [9] [10]. However, so far, there are still few studies on endoscopic hypertrophic anal papillotomy in diagnosis and treatment, and the level of evidence is low.

On this basis, this study mainly investigates the feasibility, safety and effectiveness of hypertrophic anal papillotomy by adopting transparent cap-assisted endoscopic hot snare resection.

2. Materials and Methods

2.1. Study Design and Population

Fifty-six patients who underwent transparent cap-assisted endoscopic hot snare resection for HAP at the Department of Gastroenterology, First Affiliated Hospital of Yangtze University between June 2019 and June 2021 were selected as study subjects. Relevant medical history and general information from the patients were collected, and clinical data (including age, sex, relevant medical history, clinical manifestations, endoscopic examination, treatment, pathological re-

sults, hospitalization time and follow-up results) of all patients were retrospectively analyzed. Patients with colonoscopy suggested HAP, patients who refused traditional surgery, a diagnosis confirmed by pathological examination, and those who gave their informed consent by signing a consent form themselves were included in this study.

Patients with combined anal stenosis, anal fissure, fistula, fecal incontinence, ulcerative colitis, Crohn's disease were excluded. Furthermore, in this study, patients with uncontrolled hypertension, significant bleeding tendency, pregnant and lactating women, patients with mental disorders and severe liver and kidney dysfunction, those who refused to undergo endoscopic treatment and follow medical prescriptions, or were automatically discharged from the hospital were not considered. Ethical approval was obtained from the First Affiliated Hospital of Yangtze University Ethics Committee.

2.2. Endoscopists, Equipment, and Procedure

All endoscopic procedures were performed by two gastrointestinal physicians (XT and PW) with rich experience in endoscopy (annual colonoscopy volume > 1000 cases, working experience > 10 years). A day before the examination, the patients had a low-fiber diet with little residue and fasted 12 hours before the procedure. Six to eight hours before the endoscopy, polyethylene glycol electrolyte dispersion (2 boxes dissolved in 2 - 3 L of water, taken within 2 hours before the endoscopy) was administered for intestinal preparation until clear stools were passed, and when necessary, an auxiliary cleansing enema was given. The patients were anesthetized with sufentanil and propofol intra-venously [11], oxygen was administered intranasally during the operation, and pulse rate, blood pressure, and oxygen saturation were monitored. An endoscope (Olympus CF-H260AI, colonoscope) was fixed with a conventional straight transparent cap at the tip, and the field of view was fully exposed under inflated conditions.

Patients were treated endoscopically if they had colorectal polyps or grade I-III internal hemorrhoids that had failed to respond to general treatment [12]. Endoscopic resection was considered based on patients' symptoms (including incomplete defecation, perianal itching, etc.) or HAP basal diameter ≥5 mm.

According to the number, morphology and size of HAP, an electrosurgical snare (Olympus, SD-240U-15, 15 mm ring warp, 0.4 mm wire warp) was fed into the diameter of the biopsy orifice. Then, the HAP was ensnared, tightened, and the lesion was gently lifted and pulled away from the intestinal wall by a marginal distance as far as possible. High-frequency electrical effect was set to 30 W, with electrocoagulation followed by excision of the HAP. After excision of all HAP, the mucosal defects were thoroughly flushed, and the mucosal edges were carefully observed for local bleeding, perforation, and residue. The excised HAP were recovered and sent for pathological examination. Before retiring the scope, the contents of the intestinal lumen (gas and intestinal fluid) were aspirated as much as possible to reduce postoperative bloating, abdominal pain, and the need for defecation. HAP resection alone was performed without submucosal injection and

without prophylactic antibiotics.

Postoperatively, a diclofenac sodium suppository and one compound keratanate suppository were routinely administered as well as a daily one sit bath with 1/5000 potassium permanganate solution. The operation procedure is shown in Figure 1.

Postoperative pain was assessed using the visual analog scale (VAS) pain scale [13]. In our facility, patients are routinely assessed for postoperative pain using the VAS pain scale in the inpatient wards. The basic method is to use a 10-cm-long moving scale with 10 scales on one side, "0" and "10" on both ends. 0 indicates that there is no pain; 1 to 3 indicates mild pain, which is tolerable; 4 to 6 indicates moderate pain, which affects sleep and is still tolerable; 7 to 10 indicates severe pain, which is unbearable and affects appetite and sleep. In clinical use, the patient was asked to mark the corresponding position on the ruler that represented his or her pain level by turning the scaled side back to the patient, and the physician gave him or her a score according to the position marked by the patient.

2.3. Statistical Analysis

SPSS 22.0 statistical software was used for data analysis. Continuous data were ex-pressed as Mean ± SD and categorical variables were expressed as percentages.

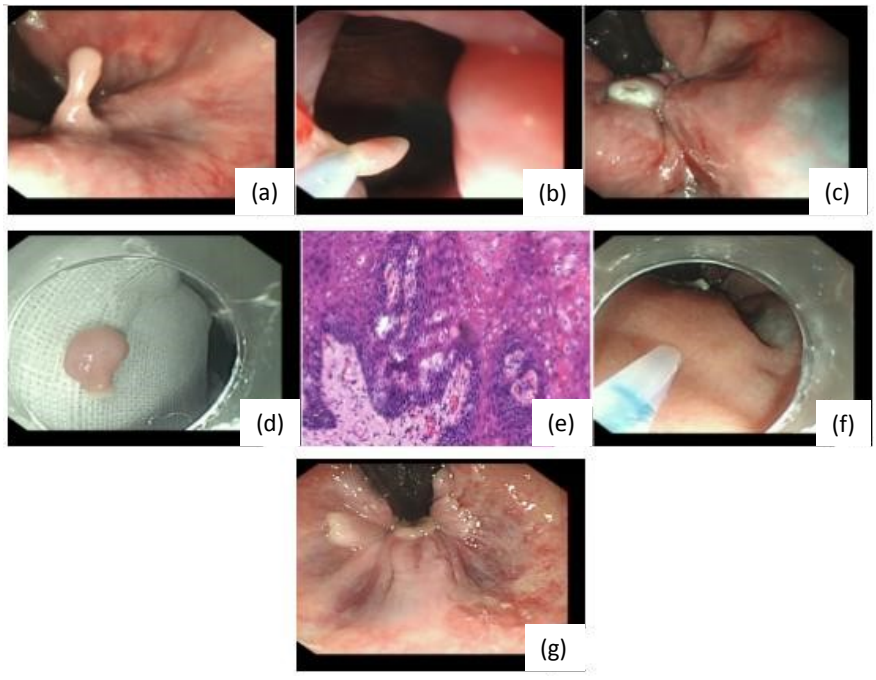

Figure 1. Transparent cap-assisted endoscopic hot snare resection for hypertrophic anal papillae (a) Transparent cap-assisted endoscopic observation of hypertrophic anal papillae; (b) transparent cap-assisted endoscopic treatment of hot snare resection treatment; (c) postoperative trauma; (d) post-resection hypertrophic anal papillae sent for pathological examination; (e) pathology suggestive of hypertrophic anal papillae (HE ×200); (f) completed together with transparent cap-assisted endoscopic sclerotherapy for internal hemorrhoids; (g) postoperative review at 7 weeks after surgery.

3. Results

3.1. Characteristics of the Participants

A total of 56 patients with HAP were treated with transparent cap-assisted endoscopic hot snare resection. Among them, 24 cases were male and 32 cases were female; age ranged from 23 to 79 years, mean (54.89 ± 11.73) years; 16 cases (28.6%) had a history of hypertension; 11 cases (19.6%) had a history of constipation; 3 cases (5.4%) had a history of hemorrhoid surgery; 2 cases (3.4%) had a history of diabetes mellitus, and 2 cases (3.6%) had a history of coronary heart disease. There were 42 cases (75.0%) of combined internal hemorrhoids (23 cases of degree I, 16 cases of degree II and 3 cases of degree III); 4 cases (7.1%) of mixed hemorrhoids; and 3 cases (5.4%) of external hemorrhoids. The patient's clinical manifestations include 47 cases (83.9%) with bleeding; 33 cases (58.9%) with incomplete defecation; 26 cases (46.4%) with prolapse; 9 cases (16.1%) with perianal itching; 9 cases (16.1%) with perianal pain; 5 cases (8.9%) without any symptoms (see Table 1 for details).

Table 1. Basic information of patients with hypertrophic anal papillae treated with transparent cap-assisted endoscopic hot snare resection (n = 56).

Item	Numerical value
Age (years)	54.89 ± 11.73 (23 - 79)
Male Cases (%)	24 (42.9)
History of hemorrhoid surgery Cases (%)	3 (5.4)
Constipation Cases (%)	11 (19.6)
Hypertension Cases (%)	16 (28.6)
Diabetes mellitus Cases (%)	2 (3.6)
Coronary heart disease Cases (%)	2 (3.6)
Type of combined hemorrhoids Cases (*%*)	
Internal hemorrhoid	42 (75.0)
First degree	23 (41.1)
Second degree	16 (28.6)
Third degree	3 (5.4)
Mixed hemorrhoids	4 (7.1)
External Hemorrhoids	3 (5.4)
Clinical manifestations Cases (*%*)	
Bleeding	47 (83.9)
Dysfunctional bowel movement	33 (58.9)
Prolapse	26 (46.4)
Itching around the anus	9 (16.1)
Perianal pain	9 (16.1)
No symptoms	5 (8.9)
Length of hospitalization (days)	4.61 ± 2.21 (1 - 10)

3.2. Clinical Outcomes

Fifty-six patients underwent transparent cap-assisted endoscopic hot snare resection for 61 HAP, of which 53 (94.6%) had single HAP and 3 (5.4%) had multiple HAP; 51 (83.6%) had a basal diameter <5 mm and 10 (16.4%) had a basal diameter ≥5 mm. Operations performed with transparent cap-assisted endoscopic hot snare excision for HAP together included whole colon examination in 56 cases (100%), endoscopic polypectomy in 20 cases (35.7%), endoscopic sclerotherapy for hemorrhoids in 29 cases (including 17 cases of grade I internal hemorrhoids, 10 cases of grade II internal hemorrhoids, 1 case of grade III internal hemorrhoids and 1 case of mixed hemorrhoids), and endoscopic rubber band ligation (ERBL) method for hemorrhoids in 11 cases (including 2 cases of I degree internal hemorrhoids, 4 cases of II degree internal hemorrhoids, 2 cases of III degree internal hemorrhoids and 3 cases of mixed hemorrhoids).

In this study, no bleeding was observed intraoperatively or postoperatively during transparent cap-assisted endoscopic hot snare excision for HAP treatment. No bleeding was also observed after both polypectomy and ERBL or rubber band ligation (RBL) for hemorrhoids completed at the same time. The patients had no pain on the first postoperative day in 32 cases (57.1%), mild pain in 21 cases (37.5%), and moderate pain in 3 cases (5.4%); no pain on the second postoperative day in 48 cases (85.7%), mild pain in 7 cases (12.5%), and moderate pain in 1 case (1.8%); no pain on the third postoperative day in 52 cases (92.9%) and mild pain in 4 cases (7.1%) (see Table 2 for details). All 56 patients were discharged after a mean hospital stay of 4.61 ± 2.21 days (with the shortest hospital stay of 1 day and the longest of 10 days) after monitoring for complications (such as, postoperative bleeding from hemorrhoids), with 100% patient satisfaction.

3.3. Follow-Up Visits, Postoperative Complications and Improvement of Symptoms

Postoperative questionnaires were filled out by telephone, weibo or outpatient follow-up review. The average follow-up period was 1 to 18 months after surgery with an average of 10.7 ± 4.4 months. Among them, 23 cases were reviewed within 1 - 12 months after surgery, 11 cases were reviewed within 12 - 18 months.

Table 2. Postoperative VAS scores of patients with hypertrophic anal papillae treated by transparent cap-assisted endoscopic hot snare resection (n = 56).

Cases (%) VAS score	Postoperative day 1	Postoperative day 2	Postoperative day 3
0	32 (57.14)	48 (85.71)	52 (92.86)
1 - 3	21 (37.5)	7 (12.5)	4 (7.14)
4 - 6	3 (5.36)	1 (1.79)	0 (0)
7 - 10	0 (0)	0 (0)	0 (0)

Note: VAS: Visual analog scale.

During this period, 2 cases were not followed up, with 96.4% and 100.0% follow-up completion and patient satisfaction rates, respectively. At 3 months after surgery, 4 patients complained of incomplete defecation and 1 patient complained of insignificant improvement of perianal itching. There was no recurrence or new HAP was found in all patients reviewed by colonoscopy. However, 22 patients declined review by colonoscopy on the account of feeling better.

4. Discussion

HAPs are predominantly skin tags that project from the base of rectal columns of Morgagni at the dentate line or the junction between the skin and the epithelial lining of the anus [3] [14]. This occurs in the anal canal area and can be solitary or multiple and vary in size. The causes are generally thought to be due to edema, inflammation, and hypertrophy of the anal papillae caused by infection, trauma, or fecal stimulation, which results in large and hardened anal papillae, resulting in anal pain, itching and even bleeding, causing inconvenience to patients in their daily life and work. HAP differ in number, morphology, and size, are mostly seen in young adults, and are larger in women than in men [15]. In this study, the mean age of 56 HAP patients was (54.89 ± 11.73) years, including 32 female patients (57.1%), 53 (94.6%) with solitary HAP, and 51 (83.6%) with HAP of basal diameter <5 mm, further verifying that HAP is predominantly female patients and suggesting that the volume of HAP is usually smaller. Furthermore, related studies have reported that HAP has about 0.6% tendency of becoming malignant [1] [2]. However, in this study, no malignant tendency was found in all 56 cases following a pathological examination. This suggests that HAPs are mostly benign masses.

Currently, conventional treatment for HAP is external and internal ligation excision, but surgery is more damaging to the body and prone to dyspareunia, pain during defecation, and slow postoperative healing [6] [16] [17] [18] [19]. As a result, patients prefer to choose alternative procedures such as RBL, injection sclerotherapy, infrared coagulation, laser photo-coagulation, and others [20] [21] [22]. In a recent cohort study designed by Henrique *et al.* [23], endoscopic rubber band ligation was found to be a feasible, safe and effective method to treat symptomatic grade II to III internal hemorrhoids. However, the authors warned practitioners to be vigilant for the slightest risk of early and late adverse events [23]. In this study, a total of 56 patients were included in the treatment of HAP by transparent cap-assisted endoscopic hot snare resection, and most of the patients had no pain or relatively mild pain after surgery. Thus, greatly reducing the physical and mental pain and stress reactions of patients. Furthermore, no serious complications were observed in this study and patient satisfaction at postoperative follow-up was 100%. All patients who underwent postoperative follow-up colonoscopy had no recurrence or new HAP, which tentatively suggests that transparent cap-assisted endoscopic hot snare resection for HAP is a safe and effective endoscopic treatment method.

It is worth noting that the benefits of cap-assisted endoscopic hot snare resection for HAP outweigh disposable anoscopy, in terms of better differentiation and treatment of anal disease from intestinal disease by performing colonoscopy before treatment. In our study, patients underwent endoscopic hot snare resection for HAP along with a full colon examination, 20 patients (35.7%) underwent endoscopic polypectomy, and 40 patients (71.4%) underwent endoscopic rubber band ligation or rubber band ligation for hemorrhoids.

The retrospective nature of this study with a small number of cases and only 34 patients (60.7%) with postoperative repeat colonoscopy, contributed to the limitations of this study. In addition, this study did not compare transparent cap-assisted endoscopic hot snare resection for HAP with other methods of hypertrophic anal papillae treatment. Therefore, its safety and feasibility need to be further evaluated and validated by accumulating data from more centers and large sample size.

In conclusion, transparent cap-assisted endoscopic hot snare resection is a new method of endoscopic treatment of HAP that is easy to perform, safe, with low medical costs, and reduces postoperative pain. It has shown low potential for recurrence after treatment and should be considered in clinical practice for better patient satisfaction. Future studies should compare transparent cap-assisted endoscopic hot snare resection with other treatment modalities.

Author Contributions

Dr. Pei-xue Wang had full access to all the data in the study and takes responsibility for the integrity and accuracy of the data analysis. Study Concept and Design: Pei-xue Wang, Wei-guo Dong; Data Acquisition, Analysis, and Interpretation: Pei-xue Wang, Isaac Kumi Adu, Xiao-ping Tan, Ming-hua Ai , Fen Yang; Drafting of the Manuscript: Pei-xue Wang, Isaac Kumi Adu; Critical Revision of the Manuscript for Important Intellectual Content: Isaac Kumi Adu, Wei-guo Dong, Xiao-ping Tan, Ming-hua Ai , Fen Yang.

Statistical Analysis

Pei-xue Wang, Xiao-ping Tan, Ming-hua Ai.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Abbreviation

ERBL Endoscopic Rubber Band Ligation
HAP Hypertrophic Anal Papillae
RBL Rubber Band Ligation
VAS Visual Analog Scale