

A COMPARISON OF THE EFFICACY AND SAFETY OF COLD VERSUS HOT SNARE POLYPECTOMY FOR SMALL COLORECTAL POLYPS

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ABSTRACT

Background and Aim: Adenomatous colorectal polyps are precancerous lesions, although most have benign course, some of them might develop into colorectal cancer which is the third common diagnosed cancer in USA. Thus, detection and resection of such lesions is very important. Recently, cold snare polypectomy (CSP) has increasingly been used over hot snare polypectomy (HSP) for the removal of colorectal polyps (3 – 10mm in size). However, the optimal technique (CSP vs. HSP), in terms of the complete resection and complications, is uncertain. The aim of our study was to compare cold with hot snare polypectomy in the complete resection and in the occurrence of post polypectomy complications in small colorectal polyps which range (3–10) mm in size.

Materials and Methods: The study began from May 2019 to April 2020, in GI Endoscopy Unit in Tishreen University Hospital. 80 polyps from 54 patients were randomly assigned to either CSP or HSP (40 polyps in each group). Total resection was studied and post Polypectomy adverse events (AEs) were monitored.

Results: Complete resection was achieved in 92.5% of polyps in (CSP) group (37/40) compared with 95% of polyps in (HSP) group (38/40) (p value = 0.646). Three patients developed delayed bleeding in (HSP) group while no AEs were seen in (CSP) group (p value = 0.048).

Conclusion: CSP is effective and safe in removing colorectal polyps range in size 3-10 mm.

KEYWORDS: Colorectal polyps, resection, CSP, HSP, Post Polypectomy complications.

INTRODUCTION

Adenomatous colorectal polyps (adenomas) are precancerous lesions that originate from the epithelial proliferation of the colonic mucosa. Most of colorectal adenomas are harmless. But over time, some of them can develop into CRC cancer, which is the third common diagnosed cancer in USA.^[1] Thus, early detection and resection of colorectal polyps may prevent this deadly cancer.

In theory, these lesions can be removed by two major techniques, biopsy-forceps polypectomy and snare polypectomy. The first method is associated with residual tissue after resection especially in polyps (> 5 mm), and thus it is not the preferable way for polyp resection.^[2]

In 1969, Dr. Hiromi Shinya made the first endoscopic resection of pedunculated colorectal polyp with hot snare

designed by Hiroshi Ichikawa.^[3] Hot snare polypectomy (HSP) is the conventional method of polyp resection, but it has some adverse events (AEs) such deep thermal injury due to electrocautery current which result in late bleeding or perforation.^[4]

Cold snare polypectomy (CSP), is a resection way without using electrocautery current. This technique was first introduced by Tappero *et al* in 1985, in his study he resected 288 small polyps with CSP without AEs such as bleeding, perforation or death.^[5] Current European Society of Gastrointestinal Endoscopy (ESGE) guidelines recommend CSP as the preferred technique for removal of diminutive polyps (size ≤5mm) due to high rates of complete resection, adequate tissue sampling for histology, and low complication rates. They also suggest CSP for sessile polyps 6 – 9mm in size because of its superior safety profile, but till today, the evidence comparing efficacy with HSP is not enough to make decision which method is the best.^[6]

Recently, multiple different studies (retrospective and RCTs) have compared the efficacy of HSP with that of CSP for colorectal polyps ranging in size between 4 and 10mm with a disparity in results.^[7,10] Given this discrepancy and the lack of supporting evidence for current guidelines for polypectomy, we performed in our GI endoscopy unit a study to compare the results of cold versus hot snare polypectomy when removing polyps range between 3-10mm in size.

MATERIALS AND METHODS

The study was approved by the Institutional Review Board at Tishreen University and done in Gastro-intestinal endoscopy unit in Tishreen University Hospital, Latakia-Syria. The study concept, hypothesis, and design were investigator-initiated, and no financial support or free devices were received.

Study design

This was an observational descriptive trial. The study colonoscopists in GI endoscopy unit typically use cold and hot snares to remove polyps that are 3 to 10 mm. Between May 1, 2019 and April 30, 2020, a total of 80 polyps from fifty-four patients were identified and randomly assigned to either the cold snare polypectomy (CSP) or hot snare Polypectomy (HSP) technique.

Patients

The inclusion criteria were patients older than 18 years of age who were scheduled to undergo colonoscopy for different indications (abdominal pain, change in bowel habits, anemia, lower GI bleeding...etc) and who were found to have at least one eligible polyp. In our Unit, we use to tell all patients to stop their anti-platelets therapy and/or anti coagulants before proper time of endoscopy and we ask for CBC and PT-INR to assure that they can go under endoscopic interventions. An eligible polyp was defined as a sessile polyp (according to Paris criteria to define sessile polyps),^[11] measuring 3-10 mm in size. The exclusion criteria were inflammatory bowel disease, polyposis syndromes and hyperplastic polyps after histologic examination.

Procedure

A gastroenterologist, with the help of fellows, performed the procedures. The procedure was a polypectomy with either a cold snare or a hot snare, and all procedures were performed with the Pentax epk-I (Hoya, Tokyo Japan). The type of snare used for the polypectomy was

(SENSATION™ Boston Scientific, USA) with 13mm Oval shaped snare. The snare can be inserted through the channel of standard colonoscope (Pentax EC-3890LK). All procedures were performed at the endoscopy center at our institution with conscious sedation. The size of the polyp was measured by visual comparison with the open snare. The size, location (proximal or distal to splenic flexure), and histological evaluation of all polyps were recorded. Each polyp was suctioned into the polyp trap after polyp transection. The resected polyps were placed in a 10% formalin container and sent for histopathological examination. To assess the completeness of the polyp resection by CSP technique, two biopsies were taken from each side of the polyp after resection and placed in the same container. Expert pathologists evaluated each sample.

Patients were observed in our post-anesthesia care unit according to standard protocols. The exact time of a given bleeding episode was also recorded for each patient. Intra-procedural bleeding was defined as bleeding during the procedure (lasting 1 min or more, which was terminated during the procedure with endoscopic intervention). Early bleeding was defined as hematochezia within 24 h after the procedure, and late bleeding was defined as bleeding in the period (1 to 30) days after the procedure. The complications and all gastrointestinal symptoms after each polypectomy were recorded. Afterwards, all patients were told to consult us if they experience any new symptoms such as rectal bleeding or abdominal pain to check for suspected post polypectomy AEs.

Statistical analysis

We used the Z. score test to compare the success rates between the groups. To study the mean differences between the two groups, we used the Independent t-student test. The criterion for statistical significance was $p < 0.05$. Data were analyzed using SPSS 17.0 program (SPSS Inc, Chicago, IL, USA).

RESULTS

Fifty-four patients (cold snare polypectomy group, $n=30$ and hot snare polypectomy group, $n=24$) were included in the study. The patients' demographic characteristics, number and size of the polyps are shown in (Table 1). And the histologic types of resected polyps are shown in table 2.

Table 1: The patients' and polyps' demographic characteristics.

	CSP	HSP	P VALUE
Patients (Male/Female)	30 (23/7)	24 (16/8)	
Mean age \pm sd	63 \pm 10	63 \pm 9	
No. Polyps	40	40	
Location (proximal/distal)	18/22	23/17	
Polyp Size (min/max)	3/10	4/10	
Mean polyp size(mm) \pm sd	5.7 \pm 1.6	6.4 \pm 1.8	0.069

Table 2: Histologic types of resected polyps.

Histologic type	No. of polyps
Tubular adenoma	70
Tubular-villous adenoma	5
Sessile serrated adenoma	4
Flat adenoma	1

Table 3: Complete resection of polyps.

Complete resection	CSP group		HSP group		P value
	No.	Percentage	No.	Percentage	
Yes	37	92.5%	38	95%	0.646
No	3	7.5%	2	5%	

There was no significant difference in the complete resection rate of colorectal polyps between the two groups (p=0.646, Table 3). In the hot snare group, three patients developed late post-polypectomy bleeding after reuse their medication. Two patients required blood transfusion and endoscopic hemostasis treatment. The three patients were over 60 years and had cardiovascular

risks. One of them was on previous treatment with aspirin 81mg and the other two patients were on direct oral anti-coagulation agents). All of them stopped their drugs before proper time of endoscopy. No adverse events were seen in cold snare group, which makes significant difference between two groups (p=0.04) No other adverse events developed in both groups (table 4).

Table 4: Adverse Events during study.

Adverse Events	CSP	HSP	P value
Post polypectomy bleeding (late)	0/0%	3/12.5%	0.04
Perforation	0/0%	0/0%	---

DISCUSSION

Endoscopic polypectomy of colorectal adenomatous polyps is widely used to prevent the development of colorectal cancer and to reduce mortality.^[12]

Most complications during colonoscopy have been associated with the removal of small polyps because these are usually numerous in number. The best polypectomy technique in small polyps is therefore a matter of clinical importance.^[13]

Hot snare polypectomy (HSP), which is performed with electrocautery, is conventionally used for polypectomy. However, cold snare polypectomy (CSP), which does not include electrocautery, has grown in popularity worldwide because of its technical ease and low incidence of adverse events (AEs), including haemorrhage and Post-polypectomy coagulation syndrome.^[14] Furthermore, because the CSP technique does not require an electrosurgical system, submucosal injection and haemostasis, cost reduction would be expected if CSP has the same efficacy as the HSP technique. However, CSP carries a theoretical risk of polyp residue due to absence of the burning effect of electrocautery on surrounding tissues.

In this study, we removed 80 polyps, (40 polyps in each group). The first goal of our study was the complete resection of polyps, and the second goal was the AEs reported after each method.

Some studies reported that the rate of histologically confirmed complete excision of CSP technique was 93.2% compared to 99% of the other method.^[12,15] In our study, there were three cases of un complete resection in the CS-arm (3/40, 7.5%), this may have been resulted from the small crushed specimens which stem largely from not using a dedicated cold snare, and this outcome could be improved by more extensive mucosal resection or modifying the existing cold snare. In the HS group, two polyps were not completely resected (2/40, 5%) and the reason might be due to cautery artifacts. And when comparing results of our study arms, it was statically insignificant (7.5% vs 5%, p=0.676).

Although in previous reports, DPPB occurred less commonly after CSP,^[16-17] we did not record any adverse event in our CS group.

In the guidelines of The American Society for Gastrointestinal Endoscopy and The European Society of Gastrointestinal Endoscopy, Post Polypectomy Bleeding rate was significantly higher in warfarin users, DOAC and clopidogrel users compared to controls,^[18] whereas the risk of DPPB is low among patients undergoing HP and being treated with aspirin as antiplatelet monotherapy.^[19] In our study, among the HS group, three patients developed DPPB (one of them due to re-introduce of aspirin the day 5 and the rest took DOAC in the day 3 after Polypectomy). Two of these patients (whom their polyps were in the right colon) were hemodynamically unstable and required blood transfusion and endoscopic treatment to stop bleeding.

As a result, our study has showed that DPPB is more common after HSP compared to CSP with significant importance ($p=0.04$).

CONCLUSION

In conclusion, CSP is an effective and safe method for the removal of sessile sub-centimeter polyps, and is a recommended polypectomy method in daily clinical setting.

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There was no financial support and no potential competing interests.

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