A prospective randomized comparison of cold vs hot snare polypectomy in the occurrence of postpolypectomy bleeding in small colonic polyps


*Department of Gastroenterology, Benizelion General Hospital, Heraklion, Crete and †Department of Social Medicine, University of Crete, Heraklion, Crete, Greece

Received 19 February 2011; accepted 6 May 2011; Accepted Article online 14 June 2011

Abstract

Aim Polypectomy techniques in the removal of polyps in the 3–8 mm size range are inconsistent. The aim of our study was to compare cold (CSP) with hot snare polypectomy (HSP) in the occurrence of postpolypectomy bleeding in small colonic polyps 3–8 mm in size.

Method In all, 414 consecutive patients with small colorectal polyps 3–8 mm in size were prospectively randomized into the CSP group and the HSP group.

Results There was no early or late postpolypectomy bleeding in either group. Intraprocedural bleeding was significantly more frequent in the CSP group than the HSP group (CSP, 19/208; HSP, 2/206; \( P < 0.001 \)) but resolved spontaneously without any intervention in both groups.

Conclusion The data show that the CSP technique is safe, effective and quicker than HSP for patients and it could be considered the ideal procedure for small polyp removal.

Keywords Small, polyps, cold, hot, snare polypectomy

What is new in this paper Given the limited existing data from randomized controlled trials, polypectomy techniques for removal of polyps 3–8 mm in size are inconsistent. Our data show that the cold snare polypectomy technique is safe, effective and quicker than hot snare polypectomy and it could be considered the ideal procedure for small polyp removal.

Introduction

The most serious complications of endoscopic polypectomy are perforation and bleeding. Most colonoscopic complications are polypectomy related and occur frequently during the removal of small polyps [1–3]. Hot biopsy forceps polypectomy has limited effectiveness and its use has diminished in many endoscopic units worldwide [3,4]. However, a 2004 survey performed in the USA on colonoscopic polypectomy practices among gastroenterologists showed that the technique was still popular [5]. On the other hand, electrocautery is unnecessary when removing small (< 1 cm) polyps and cold snare polypectomy has proved to be a safe and effective method for the destruction of small polyps without the risk of electrocautery burns and perforation [3,6–8]. Given the limited existing data from randomized controlled trials, polypectomy techniques in the removal of polyps 3–8 mm in size are inconsistent [3,5,9]. The aim of our study is to compare cold (CSP) with hot snare polypectomy (HSP) in the occurrence of postpolypectomy bleeding in small colonic polyps with a size of 3–8 mm.

Method

The study was performed in the endoscopy unit of Benizelion General Hospital from May 2010 to November 2010. Consecutive patients with small colorectal polyps 3–8 mm in size were prospectively randomized to CSP or HSP using an SPSS-generated Bernoulli sequence with a ‘success’ probability value equal to 0.5. The list was concealed until the beginning of the endoscopic polypectomy procedure when the doctor responsible for
the survey opened the respective envelope with the enclosed decision as to which polypectomy technique had to be used. Three experienced endoscopists (who had each done more than 3000 colonoscopies) participated in the study. The study was approved by the hospital ethics committee and informed consent was obtained from participating patients (Registration number: controlled-trials.com/ISRCTN91553378).

Patients with a bleeding tendency (taking anticoagulant therapy, platelet count of < 100 000/mm³ or prothrombin time more than 30% above the control) and those with inadequate colonic preparation were excluded. Patients undergoing anticoagulant or antiplatelet therapy for non-critical problems, such as cardiovascular and cerebral disorders, were instructed to discontinue the use of these types of medication at least 7 days before the endoscopic procedure. The total time of the procedure was being continuously recorded by a second stopwatch.

The principal outcome measure was postpolypectomy bleeding. All patients were contacted by telephone 12 h, 2 days and 1 month after procedure and were asked about pain, abdominal tenderness, fever and bleeding. The exact time of a given bleeding episode was also recorded for each patient. Intraprocedural bleeding was defined as bleeding taking place during the procedure (lasting 1 min or more and it was terminated during the procedure). Early bleeding was defined as haematochezia within 24 h after the procedure, and late bleeding was defined as bleeding occurring 24 h to 30 days after the procedure. Procedure time and size, location, retrieval rate and histological evaluation of retrieved polyps were recorded, as well as complications and all gastrointestinal symptoms after each polypectomy. The polyp size was measured by visual comparison with open biopsy forceps of predetermined width.

During insertion, the stopwatch ran continuously and was paused if a decision was made to perform polypectomy. It was restarted when the insertion process began again. No systematic attempt was made to examine for polyps during insertion. A careful examination technique was used during removal, pressing down folds and re-examining flexures to try to maximize mucosal views. The vast majority of polyps were removed during extubation. Withdrawal time started when the caecum was examined and stopped when the colonoscope was withdrawn from the anus. It lasted at least 6 min [10], with the stopwatch being stopped during removal and retrieval of the polyps, suctioning and washing of the colon and whilst any biopsy was being taken.

In the HSP group, small polyps were removed as a single piece with a standard electrosurgical snare (Sensation Polypectomy Snare 15 mm, Microvasive, Boston Scientific, Natick, MA, USA) and monopolar coagulation current, using a 120 W Olympus HF-120 generator with a setting of 72 W in ‘endocut’ function. In some cases, a submucosal cushion was created in the HSP group for safety reasons. In the CSP group, the polyp was removed as a single piece with the same electrosurgical snare. According to expert opinion [3], 1–2 mm of normal tissue around the small polyp was ensnared in the CSP group. All colonoscopies were performed with wide-angle (170°), high-resolution videocolonoscopes (CFH180AL; Olympus, Tokyo, Japan) with a high-definition 1080-line screen (OEVi911H; Olympus) and video processor (Evis Exera II CV-180; Olympus). Bowel preparation was accomplished with a 4 l electrolyte solution of polyethylene glycol.

All detected polyps were removed. More specifically, polyps < 3 mm were removed using biopsy forceps combined with gold probe application [11] (Microvasive, Boston Scientific). Small polyps of 3–8 mm were removed with cold or hot snaring polypectomy according to the randomization. Pedunculated or non-pedunculated polyps and flat lesions > 8 mm were removed by polypectomy snare with the conventional endoscopic technique or endoscopic mucosal resection. Most of the removed polyps were retrieved for pathology examination.

**Statistical analysis**

Continuous data were compared with the unpaired student’s t or Mann–Whitney tests as appropriate. Categorical variables were tested using corrected χ² or two-sided Fisher’s exact tests for univariate comparisons, as appropriate. The criterion for statistical significance was P < 0.05. Sample size calculation showed that at least 206 patients were needed in each group in order to achieve 80% power to detect an increase of 8% in postpolypectomy bleeding between the two groups at the 5% level of significance.

**Results**

A total of 445 consecutive patients who underwent an outpatient colonoscopy fulfilled the inclusion criteria and were enrolled in the study. Twenty-nine had to be excluded owing to inadequate bowel preparation, whilst two patients were excluded due to incomplete colonoscopy. Thus, 414 patients completed the study protocol (CSP, 208; HSP, 206).

The demographic characteristics of the patients and the characteristics of the polyps removed are presented in Table 1. There was no early or late postpolypectomy bleeding in either group. Intraprocedural bleeding was
significantly more frequent in the CSP group than the HSP group (CSP, 19/208; HSP, 2/206; \( P < 0.001 \)) but resolved spontaneously without any intervention in both groups. Additionally, there was a significant difference in the mean procedure time between the two groups (CSP, 23.3 ± 4.8 min; HSP, 29.6 ± 7.4 min; \( P < 0.001 \)). No other complications associated with small polyp removal technique occurred in either group.

Discussion

Most complications during colonoscopy have been associated with the removal of small polyps because these are so numerous. The best polypectomy technique in small polyps is therefore a matter of clinical importance [1,3].

This randomized controlled trial demonstrates that there is no difference in the occurrence of postpolypectomy bleeding in small colonic polyps removed by CSP and by HSP. As a primary end-point for this study, we chose the rate of postpolypectomy bleeding. We felt that this primary end-point would be of significant interest among endoscopists. More specifically, we worked on the hypothesis that the CSP technique would contain a greater risk of postpolypectomy bleeding than the HSP technique. By design, this study was powered to detect an 8% reduction in the rate of postpolypectomy bleeding in the HSP group. The study was not designed to detect a statistically significant difference in the perforation rate as this would require a much higher number of patients.

The main outcome of the present study was in accordance with the results of previous studies [7–9]. Indeed, the procedural time was increased in the HSP group compared with that in the CSP group. This may be due to the extra time required for insertion of the needle that is necessary for elevating the mucosal layer and creating the submucosal cushion for safety. In addition, the endoscopist has to check and fix the settings of the electrosurgery unit, so time is lost, possibly prolonging the whole procedure. Intraprocedural bleeding was increased in the CSP group; however, it resolved spontaneously and therefore this observation is not of clinical importance.

There are some limitations to our study. First, the study was scheduled to be performed in an unblinded fashion. Obviously, it was impossible to schedule it as blinded for technical reasons. Second, because the period of time for the study was short, re-examination of the patients in order to compare the effect and the recurrence rate of these two polypectomy techniques could not be conducted. On the contrary, the study was performed by three endoscopists in the setting of a typical endoscopy unit and therefore the results can be generalized.

In conclusion, our data show that the CSP technique is safe, effective and quicker than HSP and could be considered the ideal procedure for small polyp removal.

Author contributions

Gregorios A. Paspatis, study design, study execution, data analysis, manuscript preparation; Georgios Tribonias, study design, data analysis, manuscript preparation; Konstantinos Konstantinidis, study design; Angeliki Theodoropoulou, study design, study execution; Emmanouil Vardas, study design, study execution; Evangelos Voudoukis, data analysis; Irene Chainaki, study design; Maria Manolaraki, study design; Gregorios Chlouverakis, study
design, data analysis, manuscript preparation. There was no financial support and no potential competing interests.

References