

Cold snare endoscopic resection of nonpedunculated colorectal polyps larger than 10 mm. A retrospective series

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Abstract

Background and aims : Cold snare polypectomy (CSP) is an accepted technique to remove diminutive or small (6-9 mm) polyps. Here we present a series of CSP for advanced non-pedunculated polyps (> 10 mm).

Patients and methods : This is a retrospective, single operator study. A total of 111 patients with non-pedunculated polyps (Paris classification 0-IIa, 0-IIb, 0-Is) estimated > 10 mm, underwent CSP.

Results : A total of 129 polyps were removed (87 0-IIa, 18 0-IIb, 24 0-Is). The number of these polyps ranked according to size were as follows : 11-19 mm : 63 (49%), 20-29 mm : 44 (34%), ≥ 30 mm : 22 (17%). Thirty-eight (29.5%) were sessile serrated adenomas, 47 (36%) were tubular adenomas, 25 (19.3%) were villous adenomas and 18 (14%) were hyperplastic polyps. Forty-nine (38%) polyps were resected in a piecemeal fashion, submucosal injection with diluted Indigo Carmine was used in 24 (19%). Immediate oozing bleeding was frequent but in almost all patients rapid spontaneous haemostasis occurred. In only one patient haemostatic clipping was required (in order to achieve hemostasis). Preventive clipping was used in 3 patients.

There were no complications.

Seventy-two patients (with 87 lesions) had a follow-up colonoscopy. Of these 87 lesions, 9 had residual adenomatous tissue (10.3 %). According to the size of the original polyp, the distribution was as follows : 11-19 mm : 2/36 (5.5 %), 20-29 mm : 4/32 (12.5 %), > 30 mm : 3/19 (15.7%).

Conclusion : CSP for advanced, non-pedunculated lesions is feasible, effective and extremely safe. (*Acta gastroenterol. belg.*, 2019, 82, 475-478).

Key words : cold snare, endoscopic mucosal resection, advanced, non-pedunculated polyps.

Introduction

Cold snare polypectomy (CSP) is an accepted technique to remove diminutive or small (6-9 mm) polyps, with minimal risks of complications. There is less risk of immediate bleeding, delayed bleeding or perforation (1).

As we noticed the safety of this technique, we gradually performed CSP in larger lesions (initially on high risk locations as the caecum). In the context of quality measurement, we started from January 2016 a database for all non-pedunculated lesions ≥ 10 mm, removed by endoscopic mucosal resection (EMR). We were somewhat surprised about the feasibility and safety of CSP for larger lesions and since February all endoscopic mucosal resections were done by cold snaring.

Here we present a series of CSP for advanced flat sessile polyps (≥ 10 mm).

Patients and methods

This is a retrospective, single operator (LVO) study, conducted in a non-academic centre. From February 2016 to November 2018, 111 patients with flat or sessile polyps (Paris classification 0-IIa, IIb, Is) estimated ≥ 10 mm, underwent CSP. A rim of normal mucosa around the polyp was attempted to be removed. Single-use standard polypectomy snares were used, initially the SnareMaster Oval (Olympus, REF : SD-210U-25) later the Captivator medium hexagonal-stiff snare (Boston Scientific, REF : M00562340). Dedicated snares for cold resection were not used.

Anticoagulants were stopped *lege artis* before the procedure. Low doses of aspirin were permitted.

Results

A total of 129 polyps were removed (87 0-IIa, 18 0-IIb, 24 0-Is). The distribution according to size was the following : 11-19 mm : 63 (49%), 20-29 mm : 44 (34%), ≥ 30 mm : 22 (17%). Pathology showed 38 (29.5%) sessile serrated adenomas, 47 (36%) tubular adenomas, 25 (19.3%) villous adenomas and 18 (14%) hyperplastic polyps. Forty-nine (38%) polyps were resected in a piecemeal fashion. Submucosal injection with diluted indigo carmine was used in 24 cases (19%). Immediate oozing bleeding occurred frequently but almost all patients showed rapid spontaneous haemostasis. In only one patient haemostatic clipping was required in order to achieve haemostasis. Preventive clipping was used in 3 patients.

No patients reported complications after the colonoscopy.

Seventy-two patients (with 87 lesions) had a follow-up colonoscopy. Of these 87 lesions, 9 had residual adenomatous tissue (10.3 %). According to the size of the original polyp, the distribution was as follows : 11-19 mm : 2/36 (5.5 %), 20-29 mm : 4/32 (12.5 %), > 30 mm : 3/19 (15.7%).

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Two of these patients were referred for surgery ; one because of involvement of the appendiceal orificium, the other because of a difficult location on the ileocecal valve and the presence of carcinoma in situ. The others patients underwent further cold resection ; of those four had a negative follow-up (the three others are scheduled).

Discussion

Cold snare polypectomy, is an established technique for removal of diminutive (≤ 5 mm) and small (6-9 mm) polyps (1). It has a more complete resection rate than cold biopsy forceps and a superior safety profile compared to hot snare polypectomy (HSP) with lower rates of delayed bleeding, lower rates of post-polypectomy syndrome and a shorter duration of the procedure. For larger flat and sessile polyps (10-19 mm) ESGE suggests hot snare polypectomy (2). However, data comparing HSP to other techniques in this setting are limited. It is stated that CSP usually cannot achieve “en bloc” resection, in contrast with HSP. On the contrary, deep thermal injury is a potential risk with HSP and the rate of incomplete resection with HSP for polyps sized 10-20 mm is substantial (17.3%) (3). A lot of endoscopists are also afraid of immediate bleeding due to CSP. However, piecemeal CSP has been shown to be safe and effective (4,5,6,7).

ESGE guidelines provide a role for piecemeal CSP in certain situations to reduce the risk of deep thermal injury. As we started to perform piecemeal CSP for polyps sized > 10 mm in the caecum to reduce the risk of thermal injury, we noticed the feasibility and safety of the technique. Our technique of cold snaring is based on the “squeezing” of the submucosa and slicing-off the mucosa. After cold snaring, a white nodule is often seen, representing the squeezed submucosa which is still intact. This is in contrast with HSP, where the submucosa is resected and damaged. Macroscopically only the submucosa is visible after CSP (Fig. 1) while after HSP also a part of the muscular layer is visible. Therefore, one could state that only CSP is a true ‘EMR’ (endoscopic mucosal resection), and HSP is always a kind of ‘ESR’ (endoscopic submucosal resection). The pathological specimens indeed show a resected part of the submucosa by hot snaring. Cold snaring (with or without submucosal injection) shows a resection just beneath the muscularis mucosae, without damaging the submucosa (Fig. 2). Thus because of this superficial damage, the risk of important bleeding or perforation is theoretically very low.

It seems possible to achieve ‘en bloc’ resection with cold snaring for polyps sized 10-19 mm (and even larger). This can be done by closing the snare, maintaining full snare closure up to 10 s (slow transection may occur) and, when needed, tensioning by gently pulling back the closed snare with entrapped tissue to further transect the mucosa. In many cases, the mucosa is sliced off (while the snare is still entrapped in the submucosa) (Fig. 3) ; otherwise the snare can be partially re-opened to release the entrapped submucosa, while keeping the snare

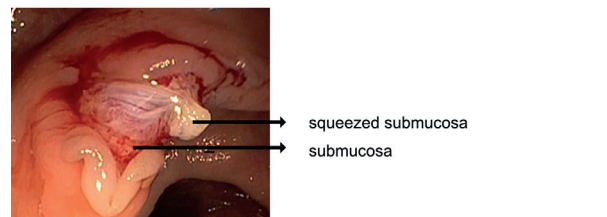
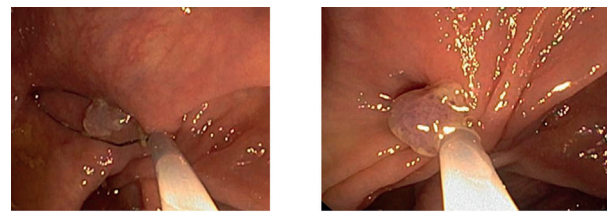


Fig. 1. — View on the submucosa with a white nodus, representing squeezed submucosa.

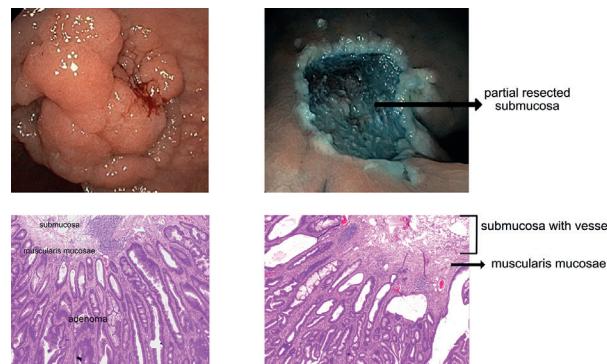


Fig. 2a. — Hot snaring of a sessile tubular adenoma.

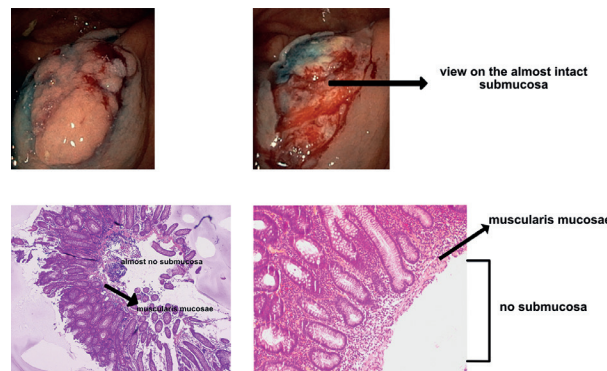


Fig. 2b. — Cold snaring with submucosal injection.

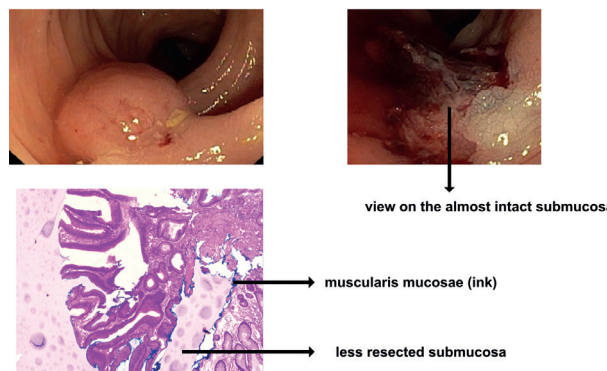


Fig. 2c. — Cold snaring without submucosal injection.

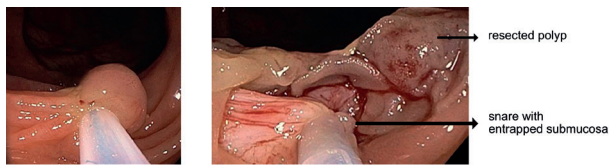


Fig. 3. — The mucosa is ripped off, while the snare is still entrapped in the submucosa.

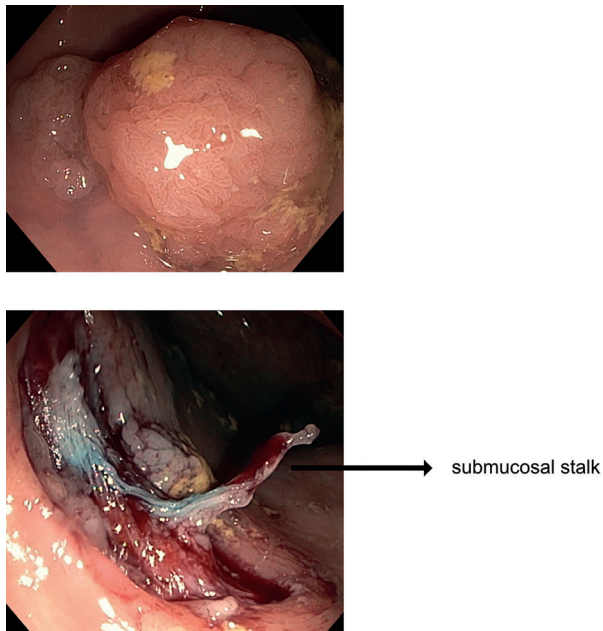


Fig. 4. — Cold snaring of an advanced lesion in a nonagenarian woman. The mucosa is ripped-off, leaving a stalk of submucosa.

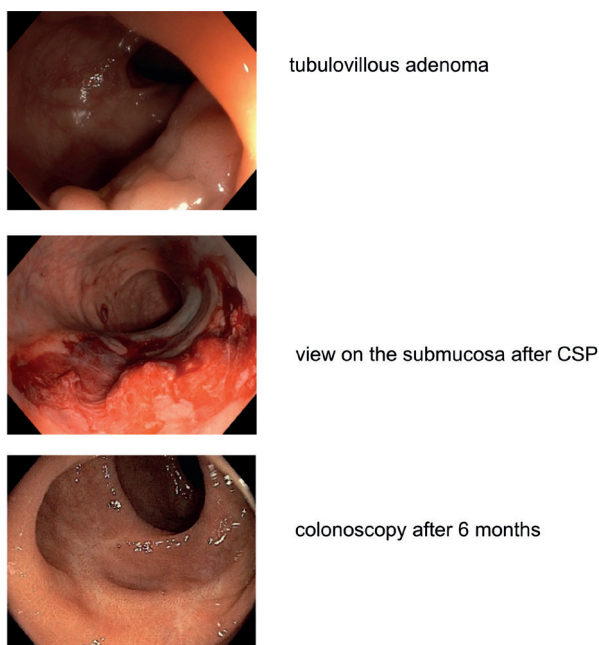


Fig. 5. — Piece-meal CSP of a tubulovillous adenoma, with removal of an additional rim.

beneath the resected lesion and thus further continuing the resection. Fig 4 is an example of an advanced lesion in a nonagenarian woman, where safety was our most important concern.

We didn't use dedicated cold snares, which can be a reason for squeezing rather than transecting the submucosa. As the technique is very safe, we developed the practice to take a large rim of normal mucosa (Fig. 5). Together with the fact that the margin is easier to inspect (no coagulation artefacts) one can assume that with a good technique the risk of incomplete resection will be low.

Presumably the number of pieces needed to achieve complete resection, is larger than with hot snaring. While performing piece meal cold snaring, there is a rather 'messy' view which could make endoscopists reluctant to perform it. But when the resection is done, followed by rinsing plentifully with water and after waiting a few seconds for hemostasis (which always occurs), it is possible to obtain a nice view on the submucosa. One should become used to that submucosal view. The threshold to additionally remove suspicious margins is very low because of the safety of the technique. Ultimately not the number of pieces, but the percentage of residual polyp tissue (and the wellbeing of the patient) is the most important parameter. The surrogate parameter of the number of pieces validated for hot snaring may not be applicable for cold snaring.

All polyps could be completely removed (based on judgement during the endoscopy) with cold snaring. In none of the cases was there a conversion to hot snaring. We advise against that practice. Cold snaring is a different technique. We take a large rim of normal mucosa and we don't use submucosal injection routinely (only for better visualization or positioning the lesion if necessary). Switching to hot snaring in that setting seems dangerous. The thermal ulcer that is made, nullifies also the safety benefit of cold snaring. And above all there is no need to do so.

We record all our EMR procedures and since the first of February 2016 all EMR procedures were performed by CSP – as presented in this case series.

No clinically important adverse events were noted such as delayed bleeding, post-polypectomy syndrome or perforation. Frequently, there was an immediate bleeding (sometimes oozing); but in almost all cases there was a rapid and spontaneous hemostasis without the need for clipping.

One hundred twenty-five lesions needed follow-up. In 3 patients (with 4 lesions in total) follow-up was stopped because of comorbidity or age. Until the 1st July 2019 in total 72 patients underwent follow-up colonoscopy of 87 lesions (of whom 43 were piece-meal resected). The majority of patients with smaller lesions resected in one-time did not reach the follow-up time at the time of the revision of the manuscript. In general, we advise our patients to have a follow-up colonoscopy after 6 months when piece meal resection was performed (or 3 months in cases of advanced histology – carcinoma in situ). When a one-time resection was performed, we advise a follow-up after 3 years (or 1 year in function of the total amount and size of the polyps, following the ESGE guidelines).

The numbers of follow-up colonoscopy according to the size of the lesions were : 10-19 mm : 36/63 (57%), 20-29 mm : 32/44 (72%), > 30 mm : 19/22 (86%).

In only three patients (4 lesions) a tattoo was placed, in one of these there was residual polyp tissue. In the 78 lesions with follow-up and without residual polyp tissue, only 26 scars were noted. These scars were mostly subtle. We suppose that less scarring is provoked by cold snaring. This could be the reason why further cold snaring of residual polyp tissue was possible.

Of the 72 patients (with 87 lesions) who underwent follow-up colonoscopy, 10% had residual polypoid tissue at the resection site. In view of the size of the removed polyps this is an acceptable result. Two patients were referred for surgery, one patient because of involvement of the appendiceal orificium and one patient because of a difficult location on the ileocecal valve and carcinoma in situ in the removed tissue during index colonoscopy. The 7 others could further be re-resected without significant difficulty. In total we can say that 129 advanced, non-pedunculated polyps could be resected without complications ; except for two with a difficult location.

It is remarkable that since the first of February 2016, we didn't see any adverse events after EMR by performing CSP. As stated already, CSP is limited to the mucosa : the only location of a benign polyp and the only layer that should be removed. There is no need to damage the submucosa, which is the layer of the adverse events (larger vessels and risk to damage the muscular layer). Larger sessile polyps – as pedunculated polyps – have a higher number of vessels and larger vessels (8), but as only the submucosa is squeezed there is less vascular injury. We also have to consider the effect of coagulation on the endothelial function and the functional blood clotting. From the thoracic surgery literature, it is known that electrocautery has a destructive effect on the endothelium (9-10).

That could also be a reason why there is frequently immediate bleeding that almost always stops spontaneously after seconds in the CSP technique. But if bleeding occurs after HSP, it rarely stops without additional intervention. Because of the increasing number of screening colonoscopies in Belgium we are confronted with huge numbers of polypectomies. Safety is an extremely important issue because only a minority of these polyps would develop into colon cancer and ultimately the goal of colon cancer screening is to increase the chance of a healthy life and not to remove polyps per se. A polypectomy should therefore be effective and safe which was the case in these series of CSP.

The present general practice of the operator is as follows. Sessile lesion (0-IIa, 0-II, and 0-Is) with a suspicion of malignancy or deep submucosal invasion (microscopic finding on biopsy OR macroscopic) are referred for surgery or eventually to a center with ESD

facility (which we do not perform in our center). All other sessile lesions (also the 'bulky' Is), regardless of size, are resected by cold snaring. The number of patients with benign-looking sessile lesions that were referred to the surgeons is very limited and mostly for reasons of difficult location (for instance at the appendix orificium, at a diverticular sigmoid ...). Also lesions with some fibrosis could be resected. Since February 2016, the thermal snare is exclusively used for advanced stalked lesions.

In conclusion, CSP is feasible and safe for larger sessile polyps. The question is why we should continue using electrocautery in these types of polyps. Randomized controlled trials are needed to answer that question.

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Conflict of interest

None.

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