



Sporadic Rectocolic Polyps Prevalence and Management

Samir Mrabti¹ Asmae Sair¹ Ahlame Benhamdane¹ Tarik Addajou¹ Réda Berrida¹ Sara Sentissi¹
Ilham Koti¹ Fedoua Rouibaa¹ Ahmed Benkirane¹ Hassan Seddik¹

¹Department of Hepato-gastroenterology II, Mohammed V Military Instruction Hospital/ Mohammed V University, Rabat, Morocco

J Coloproctol 2022;42(4):290–295.

Address for correspondence Mrabti Samir, Medical Specialist, Department of Hepato-Gastroenterology II, Mohammed V Military Instruction Hospital/ Mohammed V University, Avenue the Royal Armed Forces Riad District, Rabat 1018, Morocco (e-mail: doc.mrabti@gmail.com).

Abstract

Objective To evaluate the prevalence of polyps and their treatments.

Materials and Method This is a retrospective study conducted in our department over 20 years and 3 months between January 2000 and March 2021. All patients with colorectal polyps who underwent endoscopic resection were included. We evaluated the resection techniques and the management of complications.

Results The total number of patients was 273, with a mean age of 57.26 ± 14.058 (18–90) and a M/W sex ratio of 2. The prevalence was 3.35% and the mean number of polyps was 1.33 ± 0.69 . The most frequent symptoms were rectal bleeding (23.5%) and constipation (12.1%). The median size was 6 mm (4–12 mm). The left colonic location was the most frequent site (43%). All polyps were classified according to the Paris classification, with a predominance of sessile polyps in 45.75%, followed by pedunculated polyps, representing 42.4%. Endoscopic resection was performed either by biopsy forceps, polypectomy, or mucosectomy in 30.2%, 27.4%, and 25.4% of cases, respectively. Our study noted immediate bleeding in 1.5% of cases, and no perforations or late complications. All complications were treated endoscopically, and no patient required blood transfusion or surgical intervention.

Conclusion Endoscopic resection of rectocolic polyps is the ideal treatment for these lesions. In our department, the prevalence was 3.35%, the most used resection techniques were forceps resection and polypectomy, and the complication rate was 1.5%.

Keywords

- ▶ polyp
- ▶ colonoscopy
- ▶ prevalence
- ▶ resection
- ▶ complications

Introduction

A rectocolic polyp is a growth of tissue that depends on the wall of the colon or rectum protruding into its lumen. The polyps are very large, variable, and may be pedunculated, sessile, flat, or ulcerated. Their incidence varies from 7 to 50%, and the most common types are adenomatous and hyperplastic polyps.¹

In most cases, they are asymptomatic, with the occasional exception of some minimal bleeding, rarely massive, usually occult. Fat polyps can cause abdominal pain or more rarely an occlusion. Polyps in the rectum can be seen on digital rectal examination and can, sometimes, be the cause of tenesmus. Some polyps with a long pedicle may prolapse through the anus.

The major risk of these lesions is represented by the malignant transformation. In effect, most colorectal cancers

received

August 4, 2022

accepted after revision

September 15, 2022

DOI <https://doi.org/10.1055/s-0042-1757773>.

ISSN 2237-9363.

© 2022. Sociedade Brasileira de Coloproctologia. All rights reserved.

This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Thieme Revinter Publicações Ltda., Rua do Matoso 170, Rio de Janeiro, RJ, CEP 20270-135, Brazil

originate from an adenomatous polyp, previously considered mild to low-grade dysplasia, that has progressed to an adenomatous polyp, to high-grade dysplasia, and then to cancer.

The diagnosis is mainly based on the colonoscopy, which is also aimed at therapy, therefore allowing both the detection and characterization of polyps and their resection at the same time.¹ Endoscopic resection is the standard treatment for rectocolic polyps. It is a minimally invasive technique with very low morbidity and mortality.

The aim of our study is to assess the prevalence of sporadic rectocolic polyps as well as their management.

Materials and Methods

Materials

1. Type and period of the study:

This is a retrospective descriptive and analytical study carried out in our department over a period of 20 years and 3 months, between January 2000 and March 2021.

2. Intervention: COLONOSCOPY + RESECTION OF POLYPS

a) Examination procedure:

Colonoscopy was performed under sedation in fasting patients who underwent colonic preparation the day before the examination.

The colonoscope was introduced through the anus toward the cecum with possible catheterization of the last ileal loop. Exploration of the different colonic segments was performed during gradual withdrawal of the colonoscope. In case of detection of polyps, their precise characterization was performed (appearance, site, size, Paris classification) before performing any resections.

b) Instruments:

Several instruments have been used in the digestive endoscopy room of our service; namely, electrocauter, washing pump, biopsy forceps, injection needle, diathermic loop, hot clamp, hemostatic clips, releasable handle, physiological serum, indigo carmine and caps.

Methods

Patients

Two hundred seventy-three patients were recruited during the same period. They were admitted either for a diagnostic colonoscopy or for resection of polyps identified on previous colonoscopies. All the patients included in the study benefited from a preanesthetic consultation, and they were hospitalized the same day as the procedure, except for patients who required prior preparation, in particular a transfusion or overlap of anticoagulation. They underwent a full clinical examination and were informed about the conduct of the examination.

The Inclusion Criteria

Patients with colorectal polyps on colonoscopy.

The Exclusion Criteria

- ♣ Patient with inflammatory-looking pseudo-polyps.
- ♣ Patients with colonic polyposis.

Data Collection

Data were obtained from the medical and endoscopy records of patients.

Statistical Analysis

A descriptive analysis of our population including the different variables (demographic, clinical and endoscopic) was conducted.

a. Qualitative: in number and percentage

b. Quantitative: mean \pm standard deviation or median (interquartile range)

Statistical analysis was performed using the IBM SPSS Statistics for Windows, version 24.0 software (IBM corp., Armonk, NY, USA).

Results

Epidemiological Data

Out of 8,149 total colonoscopies performed, 273 patients had sporadic polyps, a prevalence of 3.35%. The mean age was 57.26 ± 14.058 (18–90), with the predominance of men in 66%. The M/W sex ratio was = 2. A history of colorectal cancer was noted in 38 patients (13.9%). Six (2.2%) patients were followed for chronic inflammatory bowel disease (1.8% ulcerative colitis and 0.4% Crohn disease). Finally, there was a history of polyps discovered on a previous colonoscopy in 91 patients or 33.3%. A total of 23.5% of patients had rectal bleeding, 4.9% had iron-deficiency anemia, 5.7% had abdominal pain, and 24.3% had transit disorders.

Endoscopic Results

The mean number of polyps per patient was 1.33 ± 0.69 . A total of 75.8% of the patients had only one polyp. Fifty patients (18.4%) had 2 polyps. Three polyps were found in 7 patients (2.6%). Nine (3.3%) patients had more than 3 polyps.

The median size of the polyps for each patient was: 6 mm (4–12 mm). The number of polyps whose size did not exceed 5 mm (diminutive) was 92 (35.9%). Those whose size was between 6 and 9 mm were 67 (26.2%). Sixty-eight polyps had a size between 10 and 15 mm (26.6%), and 29 (11.3%) were bigger than 15 mm.

The seat of the polyps

was mainly represented by the left colon in 114 patients (43%), rectal follow-up in 67 patients (25.3%), right colon in 47 patients (17.8%), transverse colon in 41 patients (15.5%), and, finally, the cecum in 24 patients (9.1%).

According to the Paris classification, 109 polyps were classified as Ip (42.4%), 206 were classified Is (45.75%). One polyp was classified as Ila (1.7%), 20 polyps were classified as lib (7.23%), and 1 polyp was classified as lic (1.7%).

The polyps were resected with forceps in 30.2% of cases ($n=76$), the polypectomy was performed in 69 patients (27.4%), and mucosectomy was performed in 25.4% of cases ($n=64$). A biopsy was taken in 53 patients (21%).

In our study, 4 patients (1.5%) presented with early bleeding, so that there was no perforation or late complication. During endoscopic management, a hemostasis procedure was performed by placing clips in 5 patients (1.8%) and by hot forceps in only 1 patient (0.4%).

Discussion

Epidemiological and Clinical Data

The prevalence of sporadic rectocolic polyps varies by geographical site. A European study brought together the following countries: Norway, Sweden, Poland, and the Netherlands. Of the 12,574 patients who received colonoscopy screening, polyps were detected in 48% of cases.^{2,3}

In France, a study performed by Bernardini et al. in 2015, reported a total of 416,991 polyps diagnosed, for a prevalence rate of 35.8%, whereas another annual French Society of Digestive Endoscopy (SFED) survey performed in 2017 revealed a 43% prevalence rate of rectocolic polyps.^{4,5}

In the literature, the mean age of onset of colonic polyps was 50 years with a predominance of the male sex.² In France, G. Vanbier Vliet performed a prospective multicenter observational study conducted from January 2010 to October 2012 and found polyps in 317 patients with a mean age of 68.9 ± 10.3 years (39–90 years).⁶

In a study by the SFED published in 2008, 72% of patients with sporadic rectocolic polyps had a personal history of rectocolic adenoma, 18% had a personal history of colorectal cancer, 10% had history of chronic inflammatory bowel disease, 2% had a history of other non-gastrointestinal neoplasms colic.⁷

The SFED study by Bernardini et al. in 2017 recorded that 20.6% of patients who underwent colonoscopy had transit disorders, 10.9% had rectal bleeding, and 4.7% of patients had iron deficiency anemia.⁵

Results of Colonoscopy

The evaluation of the number of polyps is essential because a polyp count > 3 is considered a high-risk polyp criterion.⁸ Bernardini et al., in the SFED study of 2017, found that 76.1% of patients had a polyp count ≤ 3 while 23.9% had more than 3 polyps.⁵

In general, polyps are most often located in the left colon. The SFED study conducted by Bernardini et al. in France reported that the distribution of polyps in the right and left colon was almost equal. Indeed, 55.1% of lesions were located in the right colon and 52.3% in the left colon.⁵ In another French study conducted by Ouvrier,⁹ the main location of the polyps was in the transverse colon (25.6%), followed by the sigmoid colon (20.9%).

We consider it a small polyp when its size is ≤ 9 mm, and anything beyond that size is considered large. Small polyps are the more frequent and represent more than 80% of all polyps.^{10,11} They can be subdivided into very small or diminutive polyps, with a size included between 1 and 5 mm and in small polyps with a size of 6 to 9 mm.¹²

Size is an important factor in the risk of malignant adenoma^{13,14} degeneration. For very small adenomas, the

risk of advanced injury (high-grade dysplasia or carcinoma) is low, with rates from 0.9 to 17.4% for adenomas of size ≤ 5 mm vs 5.3 to 53% for adenomatous polyps from 6 to 9 mm.^{13,14}

In the SFED studies performed in 2017 by Bernardini et al., we found more small polyps compared with large polyps: 43.3% of polyps were diminutives (polyps ≤ 5 mm); 30.9% were small polyps: polyps 6 to 9 mm in size, 18.9% of polyps were 10 to 20 mm in size; and 6.9% had a size ≥ 20 mm.⁵

Paris Classification

The Paris classification allows the characterization of polypoid lesions based on their macroscopic appearance and associates the latter with the risk of malignant degeneration and deep invasion. It was created in 2002 by a working group composed of Europeans, Americans, and Japanese.

The purpose of which was to suggest a simple macroscopic classification and standardization of lesions of the digestive tract to conduct prevalence studies. She does not require optical magnification or staining, making it an easy classification. It must be included in the report of colonoscopy.^{15,16}

There are three types of polyps classified according to macroscopic appearance—polypoids, plane polyps, and ulcers polyps—that contraindicate any endoscopic resection.

The classification of laterally spreading tumors (LSTs) is an appendix to the Paris classification which concerns lesions at lateral extension exceeding 10 mm. It predicts the risk of macroscopically invasive cancer.¹⁷

* Polyp chromoendoscopy:

After a white light examination, chromoendoscopy allows both to highlight the lesion and to clearly visualize the appearance of its pit pattern. It may be conventional or virtual.

Conventional Chromoendoscopy

Chromoendoscopy consists of the use of contrast or absorptive agents on a clean, well-cleaned colonic mucosa. The surface layer of the lesion is enhanced by the filling of colonic glands and furrows by the coloring agent. The two most widely used dyes are methylene blue (absorptive whose use has been abandoned in some countries) and indigo carmine 0.5% (contrast agent). The latter represents a relief dye dispersible in situ (by the working channel) and, therefore, colors the healthy mucosa blue (infiltration of the crypts) as the adenomas break off. Conventional chromoendoscopy allows¹⁸:

- The detection of planar and/or small polyps that may be omitted during a standard colonoscopy.
- The delineation of a detected neoplastic area, with a view to resection total endoscopic.
- Facilitation of the characterization of polyps by differentiating the different pit pattern histological types.

Virtual Chromoendoscopy

This is a technique using electronic staining, without the application of dyes, thanks to endoscopes allowing pre or postprocessing of the initial image. It allows an excellent analysis of reliefs, crypts, and structures of vascular polyps.

* Characterization and classification of polyps

The characterization of colorectal polyps is mainly based on the analysis of their surface architecture and their vascularization.

With the development of new endoscopic technologies, such as virtual stains, the characterization of colonic polyps has become increasingly more precise with a double interest. It allows both a standardized description and a prediction on the histological nature of the lesions (hyperplastic polyp or scalloped, tubular adenoma, tubulo-villous adenoma with or without tall dysplasia grade, superficial cancers). This prediction is particularly interesting to distinguish neoplastic from non-neoplastic lesions and to estimate the risk of invasion of the submucosa in the event of tumor lesion. Thus, the characterization of polypoid lesions enabled the endoscopist to adapt his gesture therapy in real time and choose the most suitable resection technique.

Finally, a reliable and reproducible histological prediction would make it possible to practice of new strategies consisting of “characterizing, resecting” or “characterizing, leave” the small recto-colic polyps.¹⁹

Several classifications have been described in the literature (Kudo, Sano, Nice, Wasp, CONECCCT). We will use two classifications: the NICE classification, because of its simplicity, and the CONECCCT table which combines the different classifications.

NICE Classification

The NBI international colorectal endoscopic (NICE) classification is the most accessible one. It has been established using the narrow band imaging (NBI) system, without zoom, and is based on different criteria: the color of the polyp, the existence of vessels (and their diameter), and the pattern of the mucosa. Thus, the NICE classification makes it possible to distinguish hyperplastic polyps (type 1), adenomatous polyps (type 2), and cancers infiltrators or in the submucosal invasion stage (type 3). Its downside is that it cannot distinguish hyperplastic polyps from scalloped adenomas sessile.^{19,20}

CONECCCT Table

By its simplicity the CONECCCT classification (colorectal endoscopic classification to choose the treatment) combined all the proposed classifications. In current practice, this classification tended to become the first employed.²¹

Also, the use of appropriate histological classifications was essential for judging the effectiveness of the polypectomy, that is to say, if it was curative nature or not.¹⁷

All these classifications recommend the use of optical precision (zoom), which increased the performance of the endoscopist from 10 to 20%.

*Resection of polyps:

Many techniques using different materials are used depending on the local habits (polypectomy, mucosectomy,

excise biopsy), with varying results. The therapeutic choice is based on endoscopic characterization. Polypectomy and mucosectomy are two techniques that allow the entire rectocolic polyp to be rejected. The objective of the endoscopic treatment is total excision of the polyps at the rectum and colon levels at the same time endoscopically.

Three techniques were described for the endoscopic treatment of colorectal polyps:

- Polypectomy: using a cold loop or a diathermic loop.
- Mucosectomy (endoscopic mucosal resection - EMR)
- Endoscopic submucosal dissection (ESD).

1. Polypectomy:

This is a technique using a cold handle (mechanical section of the polyps, without high frequency current) or hot (called diathermic). The goal is to place the loop as close as possible to the colonic or rectal mucosa so as to ensure a complete resection of the polyp.²²

1.1. Polypectomy with forceps or cold loop

It is a polypectomy technique to remove polyps using a clamp or a cold handle. It consists of enclosing the polyp and cutting it into 1 to 2 mm samples of healthy mucosa around the polyp. The polyp is thus removed by aspiration.¹¹

1.2. Hot loop polypectomy^{23,24}

This is a polypectomy technique in which the electric current from the diathermic loop increases the heat, which enables resection of the polyp.

In recent years, hot loop polypectomy has been used frequently, and it is one of the good practices recommended by the European Society of Gastroenterology (ESGE) to remove stalked polyps. This technique is easy to perform and has a very low complication rate, as well as a high RO resection rate.

In the case of pedunculated polyps, two resection techniques have been described in function of the presentation of the foot of the polyp: polypectomy, by moving back when the foot presents first and the polypectomy comes forward when the head of the polyp presents itself first.

Preventive hemostasis is recommended in the event the diameter of the pedicle is > 10 mm or that of the head is > 20 mm. Bleeding prevention can be mechanical (by endo-loop, or a hemostatic clip) or by an injection of adrenaline into the pedicle of the polyp. In practice, the endo-loop is more suitable for polyps with long and wide pedicles. The clips should be reserved for long and thin pedicles, and the injection of serum adrenaline should be administered in case of broad and short pedicles.

2. Mucosectomy

Unlike polypectomy, mucosectomy requires submucosal injection of a solute, which creates a cleavage space between the lesion and the muscular plane; after that, resection is performed using a diathermic loop. Lately,

mucosectomy has kept its superiority over polypectomy due to better histological quality of the obtained parts as well as safety provided by reduced risk of perforation.²³ Mucosectomy can be performed in monobloc for lesions which do not exceed 20 mm. For lesions larger than 20 mm, the piecemeal resection remains the standard for polyps without suspicious superficial lesions.

The most important part of the technique is submucosal injection. The solution used must be without side effects, at low cost, while ensuring a satisfactory and lasting uplift and must not have any effect on electric conduction. Physiological serum is the most commonly used solution as was the case in our series. Other more viscous solutions (glycerol, acid hyaluronic) are used to compensate for the speed of diffusion of the physiological serum. Their resistance to diffusion is counterbalanced by their cost and availability. Adding a few drops of indigo carmine or methylene blue to the injected solutions allows the lesion to be clearly delimited on the surface and a better visualization of the resection base to detect a possible breach of the muscular tissue or adenomatous residues.

The choice of the initial injection site and the volume injected must be carefully considered depending on the shape and location of the lesion. The injection can start at the oral pole to tilt the lesion toward the endoscope either in axial view or sometimes in retroview. It is done gradually from the outside to the inside or when the needle is withdrawn until the plane of cleavage is found, causing an uplift in “bladder of fish”.

The absence of lifting after injection (non-lifting sign) may point to a deep invasion, contraindicating endoscopic resection; however, this can be seen in case of history of previous resections, biopsies in the lesion, and non-granular LST. In these situations, submucosal dissection can be used as a rescue technique. The last step of the mucosectomy is resection with the diathermic loop. The choice of this instrument is made according to the size, location, shape of the lesion, and, especially, the operator's experience. The point of the handle should be applied most often to the oral pole in axial view; it is then opened gradually around the lesion. In case of difficulty of the point of the handle, it can be anchored by making a small notch with the tip of the handle in the injected area with an endocut current.

The handle can be closed gradually with the application of progressive back pressure on the sheath. Before cutting and once the handle is closed, a mobilization of the lesion is necessary to ensure the freedom of the lesion from the deep plane.

In the different studies, the endoscopic resection technique varied depending on the characteristics of the polyps, the technical platform, and the experience of the endoscopist.

3. Submucosal dissection

As with EMR, a submucosal injection is performed, but in this case the dissection will be at the level of the submucosa. This is a technique that requires a long

apprenticeship, and it is more quickly mastered at the rectum level than at the colon level.²³

Complications

Bleeding

The French study by D. Ouvrier reported that 12 patients presented with bleeding near the resection site during the mucosectomy, reason for which they used hemostatic clips in 7 cases, electrocoagulation in 10 cases, and the 2 techniques jointly on the same resection site in 1 case. No delayed bleeding was reported in any the patients included, regardless of the endoscopic resection technique used.⁹

In the event of bleeding during procedures, endoscopic hemostasis may be ensured with electrocoagulation using the tip of the handle or hot forceps. Clips can be used but should be avoided in case of unfinished piecemeal mucosectomy. It should be noted the important role of the washing pump, which allows the resection field to be washed and the point of bleeding to be identified.

Prophylaxis of delayed bleeding by closing the resection site (clips) is not systematic after resection of sessile polyps. The ESGE²⁵ does not recommend that when taking anti-coagulants or antiplatelet drugs or in case of lesion > 3 cm of the right colon.

Perforation

The ESGE recommends the use of a CO₂ insufflator and careful inspection of the resection area after any mucosectomy or submucosal dissection looking for a perforation or preexisting muscle injury (sign of the target). If one of these is identified lesions, endoscopic clip closure is recommended.

Numerous European studies have reported varying perforation rates between 0.2 and 0.5% after mucosectomy.²⁶

Management of Resection Pieces

Pedicated lesions should be spread out. Sessile lesions of more than 2 cm resected in monoblock, and suspicious invasive lesions resected in piecemeal should be spread out and fixed on a cork plate with needles; the resection is considered R0 if a histological safety margin of at least 1 mm of healthy tissue is present laterally and at depth. The histological feedback must mention the degree of dysplasia. In the event of sessile lesions with signs of in-depth invasion, the pathological report must specify the following elements (ESGE recommendation²⁵): degree of differentiation, presence or absence of vascular or lymphatic emboli, presence of significant tumor budding (isolated clusters of 5 cells away from the invasion front), and submucosal invasion measured in micrometers.²⁷

Conclusion

Colorectal polyps are common in the general population and are most often asymptomatic. The most common types are hyperplastic and adenomatous polyps, with the latter

inevitably evolving toward colorectal cancer. Thus, their resection constitutes the basis of the prevention of this type of cancer.

The positive diagnosis is made during the colonoscopy, which allows the characterization of these lesions as well as endoscopic resection, which is the gold standard for polyp management with a high success rate and low morbidity.

Conflict of Interests

The authors have no conflict of interests to declare.

References

- Koessler T, Bichard P, Lepilliez V, Puppa G, Ris F, Roth A. Epidémiologie, prise en charge et suivi des polypes colorectaux. *Rev Med Suisse* 2016;12(519):982–988
- Øines M, Helsing LM, Bretthauer M, Emilsson L. Epidemiology and risk factors of colorectal polyps. *Best Pract Res Clin Gastroenterol* 2017;31(04):419–424
- Bretthauer M, Kaminski MF, Løberg M, et al; Nordic-European Initiative on Colorectal Cancer (NordICC) Study Group. Population-Based Colonoscopy Screening for Colorectal Cancer: A Randomized Clinical Trial. *JAMA Intern Med* 2016;176(07):894–902
- Bernardini D, Robaszekiewicz M, Canard JM, et al. La coloscopie en 2015: de la préparation au diagnostic. Résultats de l'enquête annuelle de la Société Française d'Endoscopie Digestive. *Acta Endoscopica* 2016;46(04):257–265
- Bernardini D, Bulois P, Barthet M, et al. Une semaine de coloscopie en France: résultats 2017 de l'enquête annuelle de la Société française d'endoscopie digestive. *Acta Endosc*. 2017;47:242–251
- Vanbiervliet G, Barrioz T, Bulois P, et al. Evaluation multicentrique et prospective de la mucosectomie et polypectomie endoscopique colorectale sous aspirine (étude OPERA). *Endoscopy* 2014;46(03):A7881
- "Enquête prospective par l'envoi de questionnaires auprès de l'ensemble des gastroentérologues Français. SFED 2008." Disponible sur: https://www.sfed.org/files/documents_sfed/files/mediatheque/2Jours_Endo_enFr_2008.pdf
- Heresbach D, Marteau P. La surveillance endoscopique après polypectomie colique en objectifs pédagogiques Conflits d'intérêt. *Association Française de Formation Médicale Continue en Hépatogastro-Entérologie. Endoscopie POST'U* 2014;(561):1–6
- Delphine O Mucosectomie et polypectomie endoscopique rectocolique sous clopidogrel: résultats préliminaires de l'étude "MEDOC" Médecine Humaine et pathologique; Thèse de médecine, Faculté de Médecine de NICE, UNIVERSITE DE NICE SOPHIA ANTIPOLIS 2014
- Vleugels JLA, Hazewinkel Y, Fockens P, Dekker E. Natural history of diminutive and small colorectal polyps: a systematic literature review. *Gastrointest Endosc* 2017;85(06):1169–1176.e1
- Bretagne JF. Prise en charge des petits polypes du côlon. *Association Française de Formation Médicale Continue en Hépatogastro-Entérologie POST'U* 2016:279–88
- Church JM. Clinical significance of small colorectal polyps. *Dis Colon Rectum* 2004;47(04):481–485
- Kolligs FT, Crispin A, Graser A, Munte A, Mansmann U, Göke B. Risk factors for advanced neoplasia within subcentimetric polyps: implications for diagnostic imaging. *Gut* 2013;62(06):863–870
- Hassan C, Gimeno-García A, Kalager M, et al. Systematic review with meta-analysis: the incidence of advanced neoplasia after polypectomy in patients with and without low-risk adenomas. *Aliment Pharmacol Ther* 2014;39(09):905–912
- Hewett DG, Kaltenbach T, Sano Y, et al. Validation of a simple classification system for endoscopic diagnosis of small colorectal polyps using narrow-band imaging. *Gastroenterology* 2012;143(03):599–607.e1
- The Paris endoscopic classification of superficial neoplastic lesions: esophagus, stomach, and colon: November 30 to December 1, 2002. *Gastrointest Endosc* 2003;58(6, Suppl)S3–S43
- Emmanuel C. Classifications des polypes coliques: comment s'y retrouver? *Association Française de Formation Médicale Continue en Hépatogastro-Entérologie ; Endoscopie POST'U* 2020: 249–256
- Elmekaoui A, Benbrahim Z, Ismaili Z, Mellas N. Cancer colique: diagnostic et dépistage en pratique. *J Biologie Médicale* 2017;5(20):286–288
- Laquière A, Rahmi G. Caractérisation des polypes et incidence pratique sur la prise en charge. *Acta Endosc* 2018;48:41–46
- Perrod G, Rahmi G, Cellier C. Comment caractériser les polypes colorectaux et quelles classifications doit-on utiliser? 2017(20) n° 6:346–51
- Costes L, et al. Corrélation entre classification de CONECT et histologie des polypes coliques: Résultats sur une série monocentrique rétrospective de 300 polypes consécutifs; Endoscopie – ANGH-2020 "Disponible sur: <https://angh.net/abstracts/correlation-entre-classification-de-conect-et-histologie-des-polypes-coliques-resultats-sur-une-serie-monocentrique-retrospective-de-300-polypes-consecutifs/>
- Ameli.fr Le traitement des polypes du côlon et du rectum; traitement lors de la rectocoloscopie mai 2021. "Disponible sur: <https://www.ameli.fr/assure/sante/themes/polypes-colon-rectum/traitement>
- Haute autorité de santé Traitement endoscopique par dissection sousmuqueuse des lésions cancéreuses superficielles coliques. *Rapport d'évaluation technologique* 2019:13–15
- Dhooge M, et al. Polypectomies multiples à l'anse froide: expérience d'un centre pour la prise en charge de polyposes adénomateuses coliques. *SNFGE*; 2019:468
- Ferlitsch M, Moss A, Hassan C, et al. Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* 2017;49(03):270–297
- Moss A, Williams SJ, Hourigan LF, et al. Long-term adenoma recurrence following wide-field endoscopic mucosal resection (WF-EMR) for advanced colonic mucosal neoplasia is infrequent: results and risk factors in 1000 cases from the Australian Colonic EMR (ACE) study. *Gut* 2015;64(01):57–65
- Mathieu P, Jérôme R. La polypectomie et la mucosectomie pour les lésions colorectales en 2017: quelles sont les recommandations cliniques de la société européenne d'endoscopie (ESGE)? *Association Française de Formation Médicale Continue en Hépatogastro-Entérologie; POST'U* 2018:31–38