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Endoscopic resection and histological evaluation of colorectal polyps: Is it a definitive treatment?

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Abstract

Background and Aims Primary aim of the present study was the evaluation of efficacy and safety of endoscopic polypectomy in a tertiary advanced endoscopic laboratory in Northwestern Greece. Additional aim was to estimate the effectiveness of endoscopic treatment of colorectal polyps and record the clinical course.

Methods One hundred and fifty consecutive patients (97 men) with colorectal polyps of size larger than 0.5 cm were included. The size, topography, shape and presence of pedicle were recorded for every polyp. Concerning the size, polyps were divided into: <1 cm, between 1-2 cm, >2 cm.

Results The rectum and sigmoid were the most common sites of detection (76.6%). Endoscopic resection was successful and the complication rate was very low (2.6%). The majority of the removed polyps were neoplastic (87.1%). Most neoplastic polyps were tubulovillous adenomas (50.8%). Low-grade dysplasia was detected in most of the polyps (82.9%), but high-grade dysplasia or invasive carcinoma was also detected in some patients. In total, 10 patients underwent surgical resection. Regular follow-up did not reveal significant residual polyps or recurrence of the lesions.

Conclusion Endoscopic polypectomy is effective and safe and leads to complete resection of neoplastic polyps in the majority of cases.

Keywords colorectal polyps, adenoma, endoscopic polypectomy, complications, histological classification, endoscopic follow-up

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Introduction

An accumulating amount of evidence suggests a high incidence of colorectal cancer (CRC) in Europe and North America [1], with approximately 180,000 deaths in the 25 member states of the European Union in 2000 [2]. Although the disease may sometimes be very aggressive, CRC diagnosed at an early stage, either as a result of altered bowel symptoms or by screening has more chances of being cured and it is associated with an improved prognosis.

Polyps have been reported in up to 30% of patients over 60 years of age [3]. Especially, the adenoma-carcinoma sequence has been well established previously [4,5]. Furthermore, Japanese authors have described flat adenomas and small depressed lesions, the latter with high rate of submucosal invasion [6,7], and these lesions have also been identified in western populations [8]. In addition, clinical and epidemiological data suggest that a timely colonoscopy and removal of colonic polyps may reduce the risk for CRC [9]. Endoscopic procedures of the large bowel reduce the risk for developing CRC by 50-90%, their protective influence lasting 6 years [10-12]. This fact has supported the removal of all adenomatous polyps detected at colonoscopy.

The present article describes the efficacy and safety of endoscopic polypectomy in a population of patients in Northwestern Greece and the follow-up of those patients.

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Patients - Methods

Patients

One hundred and fifty consecutive patients (97 men and 53 women), who underwent total colonoscopy and had at least one polyp with diameter ≥ 0.5 cm were investigated. The study took place at the regional University Hospital of Ioannina, during 2008. The patients were informed for the purpose of the study, all of them gave their consent and the study protocol was approved by the Hospital Ethical Committee. In addition, the patients filled a questionnaire, concerning data from their family and personal history.

The majority of polyps were detected in a screening examination, or during the evaluation of non-specific symptoms. The patients were informed for the importance of an excellent bowel preparation which would allow a careful examination of the mucosa. None of the patients reported clotting problems during the procedure. Anticoagulation and antiplatelet medications were discontinued at least 5 days before the procedure and in high-risk patients low molecular weight heparin was administered up to the previous day of the polypectomy. Patients who did not fulfill the above plan (n=4) were scheduled for polypectomy at a consecutive session, but were not excluded from the study.

Furthermore, data concerning endoscopic characteristics of colorectal polyps (size, pedicle, base) the exact number of the resected and non-resected polyps, the topography, the technique of resection, the use of injection catheters (to pre-inject at the base of the polyp) or hemoclips (for post-polypectomy bleeding) were also collected.

Malignant polyps were stratified according to Haggitt or Kikuchi classification for pedunculated or sessile polyps respectively [13,14].

Endoscopes

A standard adult colonoscope (Olympus CF-Q145, Hamburg, Germany or Fujinon, EC-450WL5, Willich, Germany, Europe GmbH), 168 cm long with a biopsy channel of 3.8-4.2 mm was used in most cases for colonoscopy and polypectomy. A pediatric colonoscope with a biopsy channel of 3.2 mm (Fujinon EC-450LP5, Willich, Germany, Europe GmbH) was used in selected cases with diverticular disease or fixed angles (n=10). In some cases, the endoscopist had to work partially with the scope in a retroflexed position for removal of a difficult rectal polyp and in these cases a gastroscope (Olympus GIF Q145, Hamburg Germany or Fujinon) EG-450WR5, Willich, Germany, Europe GmbH) was used (n=4). In some other instances a gastroscope was used to achieve a more favorable position to resect a difficult polyp, located at an angle (n=6). A double channel colonoscope was not used in any of the cases. All endoscopic procedures were performed by the same endoscopists.

Statistical analysis

The statistical package SPSS version 12.0 (Chicago, Illinois, USA) was used for the statistical analysis and the comparisons. Data are presented as mean±SD, or median presented together with the interquartile range (IQR:25th percentile, 75th percentile) as indicated.

Results

Epidemiological data

The median number of polyps detected per patient was 1 (range 1-13), the median number of polyps resected per patient was 1 (range 1-12) and the median size of the largest polyp was 1.5 cm (range 0.6-5.0 cm).

Polyps' characteristics

The number of polyps detected per patient was 2.31±1.83 median 1, range 1-3, the number of polyps resected per patient was 1.89±1.62 median 1, range 1-12 and the largest polyp was 1.68±1.01 cm median 1,5 cm (range 0,6-5 cm).

In 114 patients (76%) the resected polyps were detected in the rectum and sigmoid, in 13 patients (8.7%) in the transverse and descending colon and in 6 patients (4%) in the cecum and ascending colon. In addition, in 16 patients (10.7%) polyps were detected over the whole colon. Finally, 70 patients had pedunculated polyps (46.7) and 63 (42%) patients had sessile polyps.

Technique of polypectomy

Mixed Endocut (combination of coagulation and cut current with the ERBE electrosurgical generator ICC200, (ERBE Electromedizin, GmbH,Tubingen, Germany) was used in 81 patients (54%), while in the remaining 69 (46%) coagulation current was used. Endocut current was selected for smaller polyps and broad-based sessile polyps, while coagulation current was used for pedunculated polyps or sessile polyps with a base smaller than 1 cm. In some cases included in the Endocut group (n=12), coagulation current was used initially, followed by blended (mixed) Endocut current to further reduce the risk of bleeding. One hundred and forty seven of them (97.35%) underwent hot snare polypectomy with a standard large snare (6cm in length and 2-3cm in width) and in 3 patients (2 with hyperplastic polyps and 1 with tubular) the polypectomy was performed with the combination of a biopsy forceps and a hot snare.

In 18 patients with sessile large polyps with a base larger than 15 mm (12%) a submucosal injection of normal saline with adrenaline 1:20,000 and a few drops of methylene blue was also performed, as previously described [15] [Fig. 1]. In 10 of them, *en bloc* resection of the polyp was achieved (mean size of the

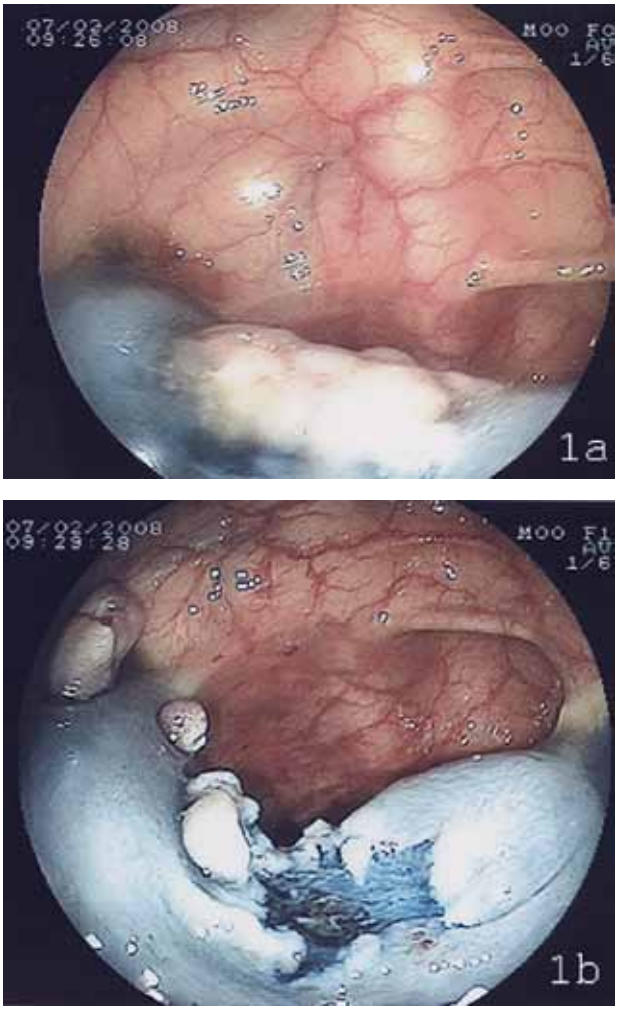

Figure 1 Piecemeal resection of a large sessile polyp. Submucosal injection with normal saline with diluted epinephrine and methylene blue was carried out circumferentially (1a). The final stages of piecemeal resection (1b)

polyp 1.8 cm) while in the remaining 8, piecemeal resection of the polyp was necessary (mean size of the polyp 2.4 cm).

The criteria for the technique used in the polypectomies were based mainly on the location, size, shape, base and type of polyp (pedunculated or sessile).

Adverse events

Early post-polypectomy complications were detected only in 5 of 150 patients. In 4 of them (2.6%) small bleeding during the procedure resulted in hospitalization and follow-up of the patients for a few days, but without important drop in hemoglobin or transfusion requirements. In 3 of the 5 patients with bleeding mixed Endocut current had been used and in the remaining 2 pure coagulation (non significant difference). In one patient the small bleeding was controlled after applying hemoclips and no further intervention was required. Abdominal discomfort a few hours after the procedure has been reported by 10 patients (6.62%).

Histological evaluation

The histological examination of the resected polyps revealed neoplastic polyps in 128 patients (87.1%), non-neoplastic polyps in 9 patients (6.1%) and 10 patients (6.8%) with a mixed type (hyperplastic/adenomatous). From the neoplastic polyps 65 (50.8%) were tubulovillous adenomas, 53 (41.4%) tubular adenomas, 8 (6.1%) and 10 (7.8%) polyps with typical adenocarcinoma. From patients with non-neoplastic polyps, 8 (88.9%) had hyperplastic polyps and one patient (11.1%) had inflammatory polyps. The histological characteristics of the resected polyps are summarized in Table 1.

Thirty-two percent of patients who were found with more than one colorectal polyp had two or more different polyp types according to the histological classification. Thus, 6 patients had tubular and tubulovillous polyps, 4 patients tubular and hyperplastic polyps, 2 patients mixed and tubular, 2 patients tubulovillous and hyperplastic polyps. One patient had mixed hyperplastic and tubular polyp and another patient had an adenoma and a rectal melanoma at the same time. Table 2 describes patients with more than one polyp types.

Low-grade dysplasia of polyps was detected in 97 patients

Table 1 Histologic characteristics in patients with colorectal polyps with size >0.5 cm

Polyp type	Number of patients	Percentage (%)
Hyperplastic	8	5.4
Tubular	49	33.4
Tubulovillous	61	41.5
Tubular or tubulovillous with high-grade dysplasia	28	19
Adenocarcinoma	10	6.8
Mixed hyperplastic-adenomatous	10	6.8
Inflammatory	1	0.7

Table 2 Histological characteristics of polyps in patients with more than one polyp type

Polyp type	Number of patients	Percentage (%)
Tubular-tubulovillous	6	37.5
Tubular-hyperplastic	4	2.5
Mixed-tubular	2	12.5
Tubulovillous-hyperplastic	2	12.5
Mixed-hyperplastic- tubular	1	6.25
Adenoma-melanoma	1	6.25

(66%), whereas high grade dysplasia was detected in 28 patients (19%) and typical adenocarcinoma in 10 patients (6.8%). The latter failed the low risk criteria of ASGE guidelines for the management of malignant polyps and underwent salvage surgery. There was also a patient with a colonic melanoma (0.7%).

Postpolypectomy follow-up colonoscopy

Only 75 patients underwent follow-up colonoscopy during the 2 years of the study (50%). From these, 35 patients had normal colonoscopy, in 23 new small polyps smaller than 0.5 cm were detected (30.6%) and resected. Due to the small diameter (<0.5 cm) of the detected polyps during the follow up procedure it was extremely difficult to assess if the polyps were previously missed or metachronous ones. Ten patients had undergone surgery and histological evaluation of the surgical specimens showed infiltration by adenocarcinoma. No patient had infiltrated lymph nodes during the operation. Finally, in 7 patients the colon appeared with partial mild inflammation without specific histological findings.

Other findings

In 18 patients (12%) diverticula in different parts of the colon were also found and 15 patients (10%) had mild diverticulitis. In 2 patients large colonic masses obstructing the intestinal lumen were detected (1.3%).

Discussion

A higher prevalence of colorectal polyps in men has been demonstrated in the present study. This finding is in accordance with previous reports [16,17]. However, its etiology remains largely unknown. In addition, the age of the patients emerges as an important contributing factor for the development of colorectal polyps in our population study. Many autopsy studies [16-18] have revealed an increasing incidence of colorectal polyps in patients over 65 years. The authors suggested a screening colonoscopy in all patients over 60 years, but newer guidelines [19] have brought that forward to the age of 50-55 years old.

Although the etiology of colorectal polyps remains largely unknown, the correlation of a rich in fat and poor in fiber diet with the development of adenomatous polyps and cancer of the large bowel has been well documented previously [20-22]. In addition, medications such as sulindac that have some effect on the prevention of polyps in familial adenomatous polyposis syndromes did not result in significant reduction in size of sporadic adenomatous polyps [3].

The size, topography, shape and presence of pedicle are important parameters while examining a polyp. Concerning the fact that the risk for carcinogenesis increases with the size of the polypoid lesion, polyps were divided into three categories in our population study: smaller than 1 cm, between 1-2 cm, larger than 2 cm. Colonoscopic detection of these lesions allowed their removal resulting also in a definite histological diagnosis. The presence of pedicle, the size of the polyp and its appearance was taken into account to define the correct treatment strategy (endoscopic or surgical), the possibility of cancerous invasion and the plan of endoscopic treatment (need for submucosal injection, prophylactic placement of hemoclips, piecemeal or *en bloc* resection). The majority of the resected polyps were adenomatous (tubulovillous adenomas or tubular adenomas). Adenocarcinoma was detected in 10 patients and colonic melanoma in one patient. No significant difference between the number of pedunculated polyps and polyps with large base was noticed. Moreover, in most patients snare polypectomy resulted to radical treatment for dysplastic polyps without submucosal invasion and basal membrane infiltration. Thus, colonoscopy allows not only early diagnosis of colorectal neoplasms, but also radical curative treatment in the early stages of carcinogenesis.

None of the examined patients reported specific to polyp symptoms. This finding indicates the importance of screening colonoscopy in the general population. The reported complications during or just after the procedure were low in our population study. Abdominal discomfort was the most common temporary complication. The specific reason for this symptom is not clear but in most cases the excessive insufflation of air appeared as the most probable cause. In 4 patients small bleeding during the procedure resulted in hospitalization and follow-up for a few days. The latter were

patients with polyp size larger than 2 cm. Therefore, the authors recommend that extra care should be taken in resecting polyps > 2 cm in diameter. This finding is in accordance with other reports [23]. In one patient the small bleeding was controlled after placing hemoclips, without any further intervention.

Binmoeller et al removed a large number (n=176) of giant polyps (>3cm). Of these lesions, 20% were tubular adenomas, 67% were tubulovillous and 13% were villous adenomas [24]. Histology of the polyps showed coexistent malignancy in 12%. Sessile lesions were resected piecemeal and pedunculated ones transected at the stalk. They did not use extensive submucosal saline injection technique at this time. Although their results were excellent, 24% of the cases were complicated by bleeding (during the procedure in most patients) but all cases of bleeding except one were treated successfully endoscopically. Eight of 176 polyps required finally surgery due to malignancy, while 1 of 7 malignant polyps with favorable criteria recurred and surgery was advised.

Iishi et al studied patients with sessile polyps 2cm or greater [25]. The polyps were resected by the endoscopic submucosal saline injection technique described above. Of the 56 polyps 25% were resected *en bloc* and 75% piecemeal. Of the patients who underwent piecemeal resection 55% required additional endoscopic or surgical intervention and the final cure rate was high (83-100%). Arterial bleeding was seen in 4 patients and in all but one it was successfully treated by clipping (one patient underwent laparotomy).

It is very important to emphasize the issue of follow-up colonoscopy in all patients with resected polypoid lesions. In our study, the follow-up period was too short to draw definitive conclusions about the prevention of a colorectal cancer. In the National Polyp Study a comparison was performed concerning follow-up colonoscopy 1 and 3 years and only 3 year after polypectomy, respectively. The authors concluded that there was no need for closer follow-up colonoscopy than 3 years after the first resection [26]. However, in young people with positive family history for colorectal cancer a closer follow-up colonoscopy was recommended. In addition, in large pedunculated or sessile polyps follow-up colonoscopy should be performed every 3-6 months after the resection and in cases with cancer development every 3 months. In the present study, a careful analytic approach was designed to address all evidence available in the literature to delineate predictors of advanced pathology, both cancer and advanced adenomas, so that patients can be stratified more definitely at their baseline colonoscopy into those at lower risk or increased risk for a subsequent advanced neoplasia. People at increased risk have either 3 or more adenomas, high-grade dysplasia, villous features, or an adenoma 1 cm or larger in size. It is recommended that they have a 3-year follow-up colonoscopy. People at lower risk who have 1 or 2 small (<1 cm) tubular adenomas with no high-grade dysplasia can have a follow-up evaluation in 5-10 years, whereas people with hyperplastic polyps only should have a 10-year follow-up evaluation, as for average-risk people [27-30]. Thus, in cases with resection of hyperplastic colonic polyps no further intervention is required one year later. However, it is now believed that there is a 'serrated pathway' to colorectal cancer that may involve some types of hyperplastic appearing polyps. The increasing recognition of these lesions and their potential to develop into cancer has led to an on-going re-evaluation of the role of hyperplastic-appearing polyps in carcinogenesis. Furthermore, a high risk of adenoma formation has been reported in some of these patients [31-32].

In conclusion, our data support the high efficacy and safety of endoscopic polypectomy for removing regular and large size pedunculated or sessile polyps in a series of consequent patients, without major complications. Histology of the polyps varied and polypectomy was an adequate treatment except in cases with invasive cancer. Most polyps were located in the left colon. However, recent insights suggest that the adenoma - carcinoma sequence might not explain all large bowel malignancies [30]. In spite of this, endoscopic polypectomy is effective in removing sessile or pedunculated adenomas with minor complications and thus it reduces the risk of developing cancer, as supported by the literature. A regular follow-up program in these patients is mandatory.

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