

RESEARCH ARTICLE

The Assessment of the Colo-rectal Polyps in Order to the New Diagnostic and Therapeutic Strategies

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Objective. Assessment of the histological and endoscopic features of the colo-rectal polyps is required for the application of the new diagnostic and therapeutical strategies in the management of the diminutive polyps.

Methods. This paper is a descriptive retrospective study on 52 patients referred for colonoscopy in Gastroenterology Clinic – Clinical County Hospital Targu Mures from January until September 2014. 80 polyps were assessed. Narrow band imaging examination targeted on the protrusive lesions allowed NICE (Narrow Band Imaging International Colorectal Endoscopic) classification and corroboration of the histology prediction and pathological assessment.

Results. Polyp detection rate was 48,58%, given the quality of bowel preparation in hospital fair in 84,5%. The predominant histological type was the tubular adenoma (46,25%), and 40% of the polyps were located in the sigmoid. Among the diminutive polyps, 58,33% were hyperplastic ($p < 0,0001$), mainly in the recto-sigmoid (66,67%); the incidence of high grade dysplasia or cancer was 0. Real-time prediction of the histology of the colorectal polyps using NBI established: NICE 1: 19 polyps, histology- 16 hyperplastic, ($p < 0,0001$, sensitivity: 100%, specificity: 95%), NICE 2: 59 polyps, histology- 53 adenomatous, ($p < 0,0001$, sensitivity: 96%, specificity: 76%), NICE 3: 2 polyps- histology- cancer.

Conclusions. We did not observe any distribution pattern in the topography of the diminutive polyps. Histologically the predominant type was the hyperplastic type. NBI was accurate in real-time prediction of the histology of the colo-rectal polyps. The results are relevant for application of the new strategies in the management of the diminutive polyps.

Keywords: colo-rectal polyps, narrow band imaging, real time prediction of the histology

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Introduction

Colo-rectal cancer remains the second leading cause of cancer death in developed countries. Detection of pre-neoplastic lesions in endoscopic surveillance and screening programs and their removal has reduced the number of cancers (by disrupting the sequence adenoma- carcinoma) and improved the prognosis of these patients [1]. Most of the colorectal tumors develop from preexisting adenomas. Polyps are detected in 40% of the screening colonoscopies and 80% of the polyps less than 1 cm are diminutive lesions <5 mm [1].

The pathological assessment of all colorectal lesions was considered in the last decades the essential examination leading to the therapeutic attitude [2], setting post-polypectomy colonoscopy surveillance period.

The possibility of real-time prediction of the histology of the colorectal polyps by advanced endoscopic techniques – narrow band imaging (NBI) led to the recommendation of a differentiated management of the diminutive polyps <5 mm detected during colonoscopy. "Predict- do not resect" strategy has been proposed for recto-sigmoid hyperplastic diminutive lesions, while „predict- resect-discard" strategy has been proposed for diminutive polyps proximal to the sigmoid [3].

For the application of these new strategies in the management of diminutive polyps is necessary to assess the endoscopic and histological features of colo-rectal polyps, the prevalence of the neoplasia among diminutive polyps. It is also necessary to assess the accuracy of real time endoscopic prediction of the histology using advanced endoscopic techniques - narrow band imaging (NBI).

Material and method:

We performed a retrospective descriptive study on 52 patients who underwent colonoscopy (conventional colonoscopy and narrow band imaging -NBI) in Gastroenterology Clinic – Clinical County Hospital Targu Mures from January 2014 until September 2014. Prior to examination patients signed an informed consent for data processing. The ethics and scientific committee of the University of Medicine and Pharmacy Targu Mures granted the ethical approval for conducting the study. Endoscopic investigations were performed using Olympus EVIS EXERA III endoscope. A total of 80 polyps were evaluated with endoscopy (based on the colonoscopy database) and histologically (based on pathology reports). We excluded from the study the patients with polyps associated with colonic polyposis syndromes or inflammatory bowel disease.

Narrow band imaging examination target on polypoid lesions allowed NICE classification (Narrow Band Imaging International Colorectal Endoscopic Classification):

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NICE 1- polyp mucosa same or lighter than background, isolated lacy vessels across the lesion or lack of vascularization, homogenous pittpattern or absence of pittpattern, predictive for hyperplastic histology; NICE 2- polyp mucosa browner than background, brown vessels surrounding ovalar, tubular, branched structures representing mucosal pittpattern, predictive for adenoma histology, NICE 3- dark brown coloration than background, patchy white areas, missing or disrupted vessels, amorphous mucosal pittpattern- predictive for cancer. Polypoid lesions were removed (cold biopsy forceps, cold snare) and referred for pathological assessment. Real-time prediction was compared subsequently to the pathological report. We used statistical analysis: chi-square test, Fisher test ($p < 0.05$ considered statistically significant). We also determined the sensitivity and specificity of NBI examination in real-time evaluation and prediction of the colorectal polyps histology.

Results

Out of the 107 patients who underwent colonoscopy (for different diseases), consisting in white light endoscopy and narrow-band imaging, from January 2014 until September 2014, we evaluated 52 patients; we identified 80 polyps- polyp detection rate - 48.59%. Thirty-three patients had a single polyp, while in 36.53% of cases multiple polyps were detected. Our study included 20 men (61.54%) and 32 women (38.46%), aged between 40 and 81 years, with a peak incidence in the 6th decade of life.

The quality of bowel preparation for colonoscopy, important parameter for polyp detection rate, was fair to excellent in 80.76% of cases (n: 42), wherever preparation (inpatient or outpatient conditions, $p=0.1897$).

We did not observe a pattern of distribution in the topography of the diminutive polyps: 40% of the polyps (n=32) were located in the sigmoid, 22.5% in the rectum (n=18) and 37.5% proximal to the sigmoid (n=30) (Figure 1).

Diminutive polyps were detected in 42.3% of the patients (n=22), representing 30% of all polyps. As against proximal location (the cecum-ascending-transverse-descendente colon), 10% of the polyps, diminutive polyps localized on the recto-sigmoid (distal location) were detected in a proportion of 20% of the polyps ($p=0.8$) (Table I).

Analyzing the colonic distribution of the polyps by histology, tabel II indicates that tubular adenomas prevail (46.25%), followed by the tubulo-villous adenomas (18.75%), the hyperplastic polyps occur at a rate of 20% and serrated polyps 7.5% (Table II). Serrated polyps were detected in 11.52% of patients.

Regarding the histology of diminutive polyps, they were hyperplastic in 58.33% of cases ($p < 0.0001$), (Table III) hyperplastic diminutive polyps were located predominantly recto-sigmoidian- 64.28% of cases (Table I, II). We have not detected dysplasia or cancer in polyps <0.5 cm. (Table No. III)

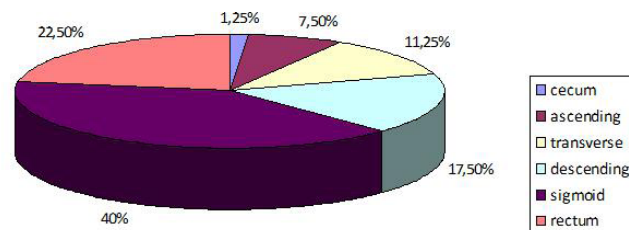


Fig. 1. Distribution of the polyps in the colon segments

Table I. Distribution of colon polyps segments depending on size

| | CECUM | ASCENDING | TRANSVERSE | DESCENDING | SIGMOID | RECTUM |
|---------|-------|-----------|------------|------------|---------|--------|
| <0,5cm | 1 | 2 | 1 | 4 | 9 | 7 |
| 0,5-1cm | - | 3 | 6 | 4 | 8 | 5 |
| 1-2cm | - | 1 | 2 | 5 | 12 | 5 |
| >2cm | - | - | - | 1 | 3 | 1 |

Table II. Distribution of polyps in the colon segments by histology

| | CECUM | ASCENDING | TRANSVERSE | DESCENDING | SIGMOID | RECTUM |
|------------------------|-------|-----------|------------|------------|---------|--------|
| hyperplastic | 0 | 3 | 1 | 3 | 2 | 7 |
| tubular adenoma | 1 | 1 | 8 | 6 | 16 | 5 |
| tubulo-villous adenoma | 0 | 2 | 0 | 2 | 8 | 3 |
| low grade dysplasia | 0 | 0 | 0 | 1 | 1 | 0 |
| high grade dysplasia | 0 | 0 | 0 | 0 | 0 | 1 |
| cancer | 0 | 0 | 0 | 0 | 1 | 1 |
| serrated | 0 | 0 | 0 | 2 | 3 | 1 |
| undefinable | 0 | 0 | 0 | 0 | 1 | 0 |

Table III. Distribution of polyps depending on size and histology

| | Hyperplastic | Tubular adenom | Tubul-villous adenom | Low grade dysplasia | High grade dysplasia | Cancer | Serrated |
|---------|--------------|----------------|----------------------|---------------------|----------------------|--------|----------|
| <0,5cm | 14 | 9 | 0 | 0 | 0 | 0 | 1 |
| 0,5-1cm | 2 | 17 | 5 | 1 | 0 | 0 | 1 |
| 1-2cm | 0 | 11 | 8 | 1 | 1 | 1 | 3 |
| >2cm | 0 | 0 | 2 | 0 | 0 | 1 | 2 |

The narrow band imaging examination using NICE classification for real-time prediction of colorectal polyps histology showed: (Figure 2)

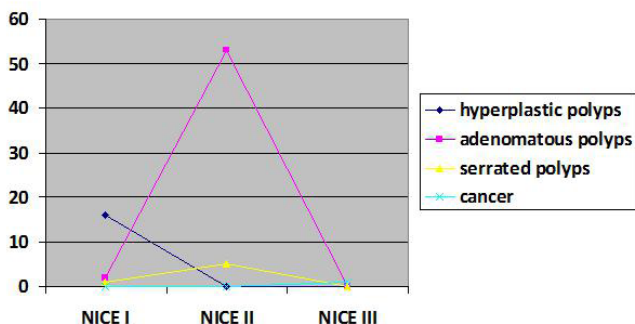


Fig. 2. Distribution of polyps according to NICE classification



Fig. 3. Endoscopic appearance (white light endoscopy and NBI) of a diminutive polyp - NICE 1

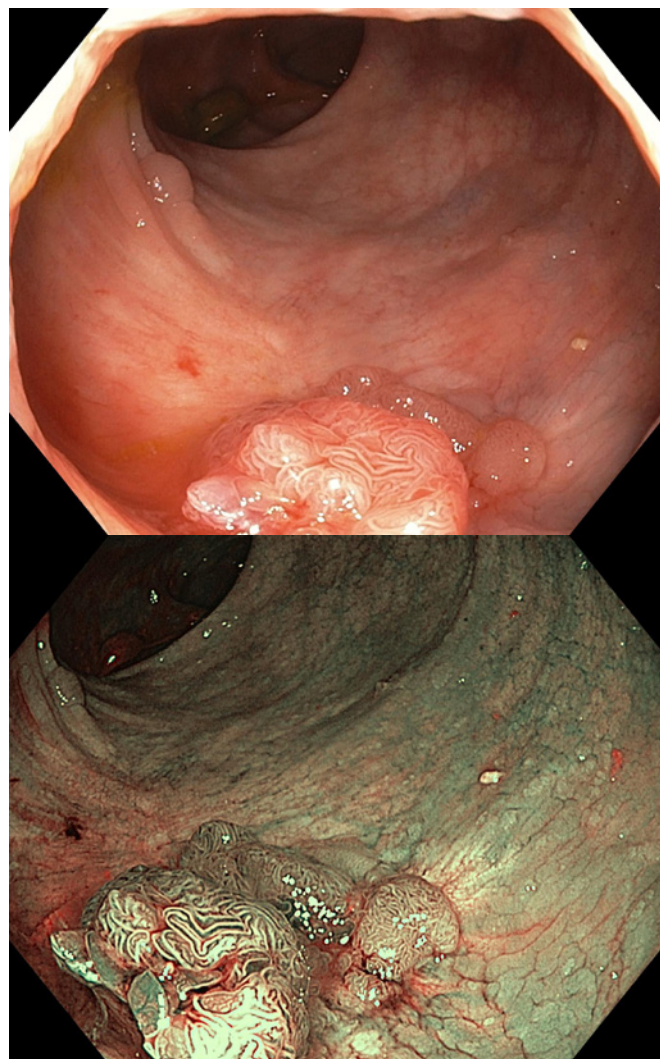


Fig. 4. Endoscopic appearance (white light endoscopy and NBI) of rectal polyp (in foreground) and sigmoid polyp (in the background) - NICE 2

19 polyps (23.75%) NICE 1 - histopathology reports of resected / biopsy specimen showed 16 hyperplastic polyps, 1 serrated polyp, 2 adenomatous polyps; $p < 0.0001$, Sn: 100%, CI: 0,7941- 1000, Sp: 95%, Cl: 0,8691- 0.9902 (Figure 3)

59 polyps (73.75%) NICE 2 - histopathology reports showed 53 adenomatous polyps, 5 serrated polyps, 1 polyp was not examined histopathologically-fragment artifacts: $p < 0.0001$, Sn: 96% CI: 0,8747- 0.9956, Sp: 76%, Cl: 0,5487- 0.9064 (Figure 4)

2 polyps (2.5%) NICE 3 - histopathology reports: adenocarcinoma; It were only 2 cases, we have not applied formulas for sensitivity, specificity

Discussions

The efficacy and safety of new therapeutic strategies in the management of the diminutive polyps based on real-time prediction of colorectal polyp histology depends on the complex interplay between accuracy, sensitivity, specificity of the high performance endoscopic techniques in evalu-

ating the polyps, on the prevalence of neoplasia among small and diminutive polyps [3]. In our study we showed a 100% sensitivity and 95% specificity of NBI in real time prediction of the histology for hyperplastic polyps, and a 96% sensitivity and 76% specificity for adenomatous polyps. Data from the literature reports, in a study published in 2009 by Rastogi et al., a 95% sensitivity and 88% specificity for predicting adenomatous polyps [4], recent publications (Wu et al 2013) highlighting an overall sensitivity of 92% and a specificity of 83% [5]. A meta-analysis of 28 studies including 6280 polyps, conducted in 2013, revealed an overall sensitivity of 91% and a specificity of 82%. The concordance of the endoscopic surveillance interval based on real-time prediction, correlated with the pathological assessment, is 92,6% [6].

Serrated polyps can be misinterpreted. In our study they were detected in 11.52% of patients, representing 7.5% of all polyps. Of the six serrated polyps detected, all of them with distal location, 5 were evaluated as NICE 2 and one serrated diminutive polyp as NICE 1. The difficulty to dis-

tinguish serrated polyps from adenomatous or hyperplastic lesions is the weak point of NICE classification, due to the absence of a reference standard [6].

In regards to the endoscopic and histopathological characteristics of diminutive polyps, they were detected in 42.3% of patients; 58.33% of the diminutive polyps were hyperplastic ($p < 0.0001$); in our study we did not detect high-grade dysplasia or cancer among the diminutive polyps. In a study of 10,060 colonoscopies in the US, less than 1/1100 of the diminutive polyps had an invasive cancer histopathology [7], while in the US 40% of the diminutive polyps are considered non-neoplastic. A Japanese study conducted by Sakamoto *et al* showed less than 1% of the diminutive polyps with high-grade dysplasia or invasive carcinoma histology compared with a prevalence of neoplasia between 1-5% among the polyps between 6 to 9 mm [8]. Centralized data of 18705 Japanese patients with colorectal lesions revealed diminutive polyps in 43.6% of cases (of which 35 cases- 0.4% carcinomas), adenomas in 86.4% of cases and other histology types in 13.2% of cases: hyperplastic, inflammatory polyps [9]. Special attention should be paid to depressed diminutive lesions because carcinoma has significantly higher prevalence in these type of lesions [9].

Japanese literature data [9] reveals differences of opinion between the Western European and American attitude as against the Japanese one in the management of the diminutive polyps. Considering the cost saving with de pathological assesment of the biopsies and the reduction of the risk of complications such as perforation for multiple polyps removal, the English Literature attitude advocates the predict- do not resect strategy for recto-sigmoid diminutive hyperplastic polyps, predict- resect-discard strategy for proximal to the sigmoid located polyps [7]. Financial policies of Japanese healthcare system consider the costs of the polypectomies and of the pathological assessment relatively small, which is why they recommend evaluating the colorectal polyps with NBI followed by removal using cold biopsy or the cold snare technique, followed by pathological assessment of all polyps.

The limits of our current study on endoscopic and pathologic characteristics of the colorectal polyps are: relatively small number of cases (selected for evaluation both in white light endoscopy and narrow band imaging), heterogeneous cases (screening colonoscopy, colonoscopy to symptomatic

individuals, prior conventional colonoscopy during which polypoid lesions were detected). Regarding the real-time prediction of colorectal polyp histology, NICE type assessment was given by different gastroenterologists with varying degrees of expertise in NBI examination.

Conclusions

The topography and the histology of the colorectal polyps does not follow a specific distribution pattern. Diminutive colorectal polyps are mainly hyperplastic ($p < 0.0001$). NBI allows real-time assessment of colorectal polyp histology with high sensitivity and specificity (NICE 1: sensitivity: 100%, specificity: 95%, NICE 2: sensitivity: 96%, specificity: 76%). NBI allows real-time post-polypectomy surveillance interval prediction. Serrated adenomas can be misinterpreted. The high sensitivity and specificity of NBI in real-time prediction of the polyp histology have relevance in application of the new strategies in the management of the diminutive polyps: “predict- -do- not resect” strategy for recto-sigmoidian hyperplastic diminutive lesions, „predict- resect-discard” strategy for diminutive polyps proximal to the sigmoid.

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