THE ROLE OF COLORECTAL POLYPS IN THE ETIOLOGY OF LOWER GASTRO-INTESTINAL BLEEDING IN CHILDREN

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Abstract

In children, colorectal polyps most commonly present with rectal bleeding. The aim of this study was to establish some correlations between clinical, endoscopic/histopathological aspects and therapeutic options in pediatric colorectal polyps. The experimental group included 253 children aged between 1 and 18 years, patients being included based on the presence of rectal bleeding associated with abdominal pain and/or constipation, established through colonoscopic examination. 39 polyps were identified: 37 with single lesions and 2 with multiple lesions. The solitary polyps, located mostly in the rectum and sigmoid, having sizes between 1 and 2.5 cm, were removed during the same colonoscopy. Pathology showed inflammatory aspects and two cases of hamartomatous polyps in a Peutz-Jeghers and a Bannayan-Riley syndrome. Colonoscopy should routinely be recommended in children with suspected polyps; in multiple lesions, periodic surveillance by colonoscopy and histology is mandatory.

Keywords: children, colorectal polyps, lesions.

1. INTRODUCTION

One of the most important pathologies in pediatric practice refers to intestinal polyps, which can be isolated or can occur within polyposis syndromes; together with inflammatory intestinal diseases, they cause rectoragy in children. Generally, most colonic polyps are benign, however, they can be divided into two major categories: non-neoplastic polyps (90%) (hyperplastic polyps, Peutz-Jeghers hamartomatous polyps, juvenile hamartomatous polyps, lymphoid polyps, inflammatory polyps) and neoplastic polyps, in 10% of the cases: tubular (90%), tubulovillous (9%) and villous (1%) adenomas. Some children and adolescents with polyps have an underlying predisposition to develop colorectal cancer (CRC). Identification of a polyposis syndrome in offspring may have major implications for parents. Adult and pediatric gastroenterologists should be aware of the underlying inheritance patterns of polyposis syndromes, so that patients and their families can be adequately evaluated and managed. Examination of a lower gastrointestinal bleeding (LGIB) in a child must also include an endoscopic examination with biopsy and histopathological examination of the respective fragments. The present study reports the modes of presentation, location, treatment and histology of colorectal polyps in a group of Romanian children.

Objective: To establish some correlations among the clinical, endoscopic and histological aspects, as well as the therapeutic options in a series of children with colorectal polyps.

2. MATERIALS AND METHOD

A group of 253 children with ages between 1 and 18 years, admitted to our pediatric gastroenterology unit between 2012 and 2014, was investigated. Inclusion criteria: the presence of lower gastrointestinal bleeding with melena, rectoragy, hematochezia or at least 2 positive tests for fecal occult blood and carrying out of a colonoscopy/rectosigmoidoscopy. Exclusion criteria: children under the age of one, children which did not undergo endoscopy/colonoscopy due to their and/or their parents’ refusal of these procedures, or due to technical or medical reasons, gastrointestinal hemorrhages caused by surgical emergencies, infectious diseases, intestinal diseases with immunological or toxic
mechanisms (intestinal intussusceptions, sanguinolent diarrhea caused by enteropathogenic microorganisms), patients that ingested substances which can be mistaken for a false hemorrhage (fruits and vegetables containing peroxidase: broccoli, radish, tomatoes, beet soup, blueberries, beverages that contain red dye, iron supplements, bismuth salts), hematologic diseases, coagulation disorders, neoplastic diseases, neurologic diseases (chronic infantile encephalopathy, spastic paraparesis). The investigation protocol included full blood count and coagulation profile, routine biochemical tests, stool culture and surgical examination; all children underwent colonoscopy, completed, if necessary, with endoscopic polypectomy and anatomopathological examination of the sample.

3. RESULTS

The experimental group included 253 children with ages between 1 and 18 years. The cases were evenly distributed along the three years of study: the lowest number of cases was recorded in 2013 (32.01%), 33.20% of them - in 2012, a slight increase (34.78%) being noticed in 2014. Gender-based case distribution is almost even, although males do form a majority (50.98% versus 49.02%), yet with no statistically significant differences. More than half of the cases are included in the 1-7 year age group (52.38%). The 8-18 year age category has an even distribution and amounts to 47.62% of the cases. (Fig 1)

In most of the cases, the patients presented to the hospital with rectoragy (84.18% of cases), followed by hematochezia (14.22%), while positive test results for fecal occult bleeding could only be identified in 1.60% of the cases.

![Fig. 1. Age and gender distribution of the children included in the study](image)

About one third (36.75%) of the patients included in the study presented with abdominal pain, 12.64% had a slow intestinal transit, and 9.48% had additional symptoms, including abdominal pains and delayed intestinal transit. Almost half (41.10%) of the subjects presented no associated symptoms (Fig. 2). Abdominal pain was located in the umbilical region in 35.04% of the patients, in the hypogastric region in 10.25% cases, and in the left lumbar region in 40.17% of the children, while 14.53% of them complained of diffuse pain. (Fig. 3)

![Fig. 2. Associated symptoms in the series of patients](image)

![Fig. 3. Location of abdominal pain](image)

Inspection and digital rectal examination were performed in all children in the outpatients department. Barium enema was not done in any. Laboratory data included blood count parameters, biochemical markers of hydroelectrolytic and acid-base balance, blood coagulation parameters. The coagulation parameters were within normal limits, while the disorders of the hydro-electrolytic and acid-base metabolism included metabolic acidosis (18.18%), hyponatremia (16.20%) and hypokalemia (9.88%). Out of the hematological markers, the distribution of hemoglobin values was analyzed. Anemia was
determined with hemoglobin values below 12 mg/dl and hematocryte values below 36%, depending on patients age. The value of hemoglobin in patients with LGIB averaged at 10.49 mg/dl, with a standard deviation of 0.22. In the vast majority of cases, colonoscopy/rectosigmoidoscopy was performed 24-48 hours after presentation (73.12%); there was only one case where the colonoscopy was carried out within less than 24 hours of presentation, in 26.48% of the cases colonoscopy being carried out within 48-72 hours of admission. The most frequent causes of LGIB identified in the studied group were nonspecific colitis lesions (46.24% of which include: localized or disseminated inflammation, fissures, erythematous lesions), anal fissures found in 16.60% and colorectal polyps found in 15.41% (i.e. 39) of the cases (37 solitary lesions and 2 cases of multiple lesions in intestinal polyposis syndromes: 1 case of Peutz-Jeghers syndrome and 1 case of Bannayan-Riley syndrome). Other causes included: ulcerative colitis (9.48%), (Fig. 4) rectal ulcer (6.71%) and internal hemorrhoids (5.53%).

Colonoscopy revealed a total of 39 polyps; 37 of them were single lesions, while multiple lesions could be visualized in 2 cases.

Most of the polyps were pedunculated, had thin implantation bases and could be easily removed using oval or hexagonal-shaped polypectomy snares. In 5 patients, the colonoscopy procedure revealed residual pedicles and we assume that the polyp had amputated itself. Colorectal polyps were of the solitary type, with a rectosigmoidal location and sizes between 1 and 2.5cm, being removed during the same colonoscopy procedure (Figs. 5-7). During endoscopic removal, we reported 1 case of massive bleeding and 2 cases of post-polypectomy perforation, that were urgently addressed to the surgery department and had a favorable postoperative evolution. The biopsy samples were analyzed in the Pathology Department of the “St. Mary” Emergency Clinical Hospital for Children.
The histopathological exam performed in 30 cases (as, in the other cases, the polyp could not be recovered after polypectomy or it was already self-amputated) highlighted typical aspects of inflammatory polyps: granulation tissue, inflammatory infiltrate with numerous neutrophils and eosinophils in lamina propria and deformation of the colonic epithelium with dilated, branched and hyperplastic glands (Figs. 8,9). Hamartomatous polyps were identified in two cases.

The check-up performed after 2 months included a follow-up colonoscopy; in 37 of the cases (94.87%), the patients were fully healed; the 2 patients with multiple lesions continue to undergo endoscopic monitoring.

4. DISCUSSIONS

Histologically, polyps may be classified as neoplastic (benign or malignant) and non-neoplastic (inflammatory or hamartomatous) formations [1,2]. In pediatrics, colorectal polyps appear as one of the most important and frequent GI tract conditions, commonly present as painless rectal bleeding and secondary anemia. Most polyps are solitary, with no genetic predisposition or long-term risk of neoplasia. Over 90% of the colorectal polyps in children are juvenile, solitary polyps located in the rectosigmoid colon. Juvenile polyps are most frequently diagnosed in the first 10 years of life, with a peak age of diagnosis between 2 and 7 years, as reported in our patient series (52.38%). Rectal polyps can be palpated by digital rectal examination, and they can be removed through the anus. However, the increasingly routine use of colonoscopy in children with rectal bleeding has enabled detection of not only multiple polyps but also of the proximally located ones, which would otherwise go undetected. The prevalence of polyps located above the rectosigmoid colon is higher than previously thought [3], as confirmed by several investigations [4-7]. Current data indicate that approximately 40% of the polyps are located in the rectosigmoid region, the rest being evenly distributed throughout the proximal colon [3]. Therefore, a total colonoscopic examination should be provided if a polyp is detected in a child, regardless of its location. Solitary juvenile polyps carry no risk of intestinal cancer [8]. The number of juvenile polyps is important because more than five polyps may however carry implications for CRC risk, as discussed below. A challenge occurs when managing a patient with three or four juvenile polyps, because it is unclear whether the patient will develop the JPS phenotype and, therefore, be at significant risk of intestinal cancer [9]. Intestinal polyps can represent the clinical expression of various syndromes, namely familial adenomatous polyposis (FAP), with variants such as the Gardner and Turcot syndromes, hamartomatous polyps, found in the Peutz-Jeghers syndrome, Cowden, Bannayan Riley Ruvalcaba, Cronkhite-Canada, familial juvenile polyposis (FJP), as well as more infrequent syndromes with mixed characteristics (for instance, the Gorlin syndrome) [8-10]. With the exception of the Cronkhite-Canada syndrome, all variants are associated with genetic mutations [11]. The frequency is variable; in the US, FAP has an estimated incidence of 1/13,000 live births [8,12]. The age of presentation varies depending on the syndrome; thus, inflammatory polyps can cause lower gastrointestinal bleedings starting with very young ages, while familial adenomatous polyposis, as well as the Peutz-Jeghers syndrome, occur especially during adolescence. There are also cases where extraintestinal manifestations precede the actual manifestations that occur due to polyposis [12]. Thus, FAP includes multiple adenomatous
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Polyposes localized throughout the entire colon, as well as at gastroduodenal level, ocular changes; the malignancy risk of the lesions is associated with the possibility of developing hepatoblastoma, osteosarcoma or thyroid carcinoma [8,12]. The Gardner syndrome also includes cutaneous changes (cysts), osteomas, dental anomalies, Cushing syndrome or multiple endocrine neoplasia of type 2 [12]. The Turcot syndrome includes lipomas, café-au-lait spots and central nervous system (CNS) tumors (glioblastomas, astrocytoma) [12]. The Peutz-Jeghers syndrome is associated with multiple pedunculated hamartomatous polyps that can cause intestinal bleeding or intussusceptions, most frequently located at the level of the jejunum, nasal polyposis, melanin spots on the lips, as well as testicular and ovarian tumors that may occur over time [11]. FJP includes congenital heart disease, lesions of the CNS and genito-urinary tract, osteomas. The investigation protocol includes routine hematological and biochemical testing, coagulation profile, genetic testing, dosage of serum alpha-fetoprotein, alpha-1-antitrypsin and fecal calprotectin, dosage of hormones (FT4, T3, TSH, ACTH), and imaging tests (colonoscopy, upper gastro-intestinal endoscopy, wireless capsule endoscopy); as a function of the manifested syndrome, other procedures - such as cranial radiographies, ultrasonography, CT, and MRI - may also be added for detecting abdominal masses, as well as pelvic, mammary and testicular ultrasound exams [12,13]. It is necessary to keep monitoring patients with intestinal polyposis syndromes, due to the potentially malignant evolution of such diseases. Thus, FAP patients almost invariably develop colorectal cancer; colonoscopic screening is carried out twice a year, and prophylactic surgery becomes a necessity (proctocolectomy with ileoanal anastomosis, subtotal colectomy with ileorectal anastomosis or total proctocolectomy with permanent ileostomy) [14]. In the case of the Peutz-Jeghers syndrome, upper gastro-intestinal endoscopy will be performed biannually and colonoscopy will be performed once every three years; suspect lesions will be biopsied and removed, and antrectomy or duodenectomy can be performed if necessary [15]. Around 50% of the patients with FJP develop gastrointestinal cancer. Upper gastro-intestinal endoscopy and colonoscopy will be carried out until the complete removal of lesions; complicated cases with recurrent or massive hemorrhages require prophylactic colectomy and ileorectal anastomosis [16]. Our casuistry revealed inflammatory polyps in 93.33% of the cases and hamartomatous polyps in 6.66% of the cases. In 37 cases, endoscopic polypectomy resulted in complete removal of the lesions. Histopathological testing confirmed the benign nature of polyps. The two month follow-up confirmed that all patients with solitary polyps were fully healed; the children with intestinal polyposis syndromes continue to be under clinical, endoscopic and histological monitoring.

5. CONCLUSIONS

Colorectal polyps can be isolated or multiple, located usually in the rectum and sigmoid colon and only rarely harboring potential malignancy risk in children. Rectal bleeding is the commonest way of clinical presentation. Colonoscopy is not only sensitive in detecting colorectal polyps, but it is also an efficient therapeutic tool. Therefore, it should be routinely recommended to children with suspected polyps, regardless of their localization. In multiple lesions, periodic surveillance by colonoscopy and histology is mandatory.

References