Juvenile Polyposis Syndrome

DO Whittle, MG Lee, B Hanchard

ABSTRACT

Juvenile polyposis syndrome (JPS) is rare and is present when there are multiple juvenile polyps in the gastrointestinal tract, usually the colon. The importance of this condition is the association with the development of colorectal and upper gastrointestinal cancer at a young age. We report the case of a 21-year old male with a two-year history of intermittent rectal bleeding and anal protrusion. Colonoscopy revealed multiple pedunculated cherry red polyps mainly in the left colon. Histology confirmed juvenile polyps. Juvenile polyposis syndrome should be considered in young patients with colonic symptoms, especially rectal bleeding. It is important to distinguish between patients with JPS and patients with an isolated harmatomatous juvenile polyp.

Keywords: Juvenile, polyposis

Síndrome de Poliposis Juvenil

DO Whittle, MG Lee, B Hanchard

RESUMEN

El síndrome de poliposis juvenil (SPJ) es raro y se presenta en forma de pólipos juveniles múltiples en el tracto gastrointestinal, generalmente en el colon. La importancia de esta condición estriba en su asociación con el desarrollo del cáncer colorectal y el cáncer gastrointestinal superior en la edad juvenil. Reportamos el caso de un joven de 21 años con una historia de dos años de sangramiento rectal intermitente y protrusión anal. La colonoscopía reveló múltiples pólipos pedunculados de color rojo-cereza, principalmente en el colon izquierdo. La histología confirmó la presencia de pólipos juveniles. El síndrome del poliposis juvenil debe ser considerado en los pacientes jóvenes con síntomas colónicos, especialmente cundo hay sangramiento rectal. Es importante distinguir entre pacientes con SPJ y pacientes con un pólipo juvenil harmatomatoso aislado.

Palabras claves: Juvenil, poliposis

West Indian Med J 2010; 59 (3): 306

INTRODUCTION

Juvenile polyps are hamartomas which are usually solitary and confined to the recto-sigmoid region of the colon, occurring more commonly in the first two years of life (1, 2). Juvenile polyposis syndrome (JPS) is a rare clinical problem characterized by multiple juvenile polyps in the colon but the small intestine and the stomach may be involved (3). Because of the rarity of this condition, clinical experience in management is limited. The importance of JPS is the association with the development of colorectal and upper gastrointestinal cancer at a young age (3, 4). Juvenile polyposis syndrome should be considered in young patients with colonic symptoms, especially rectal bleeding and all patients with JPS or a family history of juvenile polyps should undergo surveillance for colorectal neoplasia (5). It is also important to distinguish between patients with JPS which is rare and children with an isolated harmatomatous juvenile polyp, as the latter have no malignant potential. We report on a patient with the juvenile polyposis syndrome and briefly review this unusual problem.

CASE REPORT

A 21-year old male presented to the Gastrointestinal clinic of the University Hospital of the West Indies, Jamaica, with a two-year history of intermittent rectal bleeding in the course

From: [1]Departments of Medicine and [2]Pathology, The University of the West Indies, Kingston 7, Jamaica, West Indies

Correspondence: Professor MG Lee, Department of Medicine, The University of the West Indies, Kingston 7, Jamaica, West Indies. E-mail: michael.lee@uwimona.edu.jm

of being treated for rectal haemorrhoids by his general practitioner. He passed a small volume of bright blood recently, at times mixed with stool. The bleeding was not precipitated by constipation or straining. There was no associated pain or tenesmus. Occasionally, he noted a fleshy material protruding through the anus which he was able to reinsert manually into the rectum. He did not report a significant history of constipation, diarrhoea, nausea, vomiting, jaundice, syncope or constitutional symptoms. There was no family history of colonic polyps or cancer.

Physical examination revealed a young healthy male with pink mucous membranes and no significant lymphadenopathy. His abdomen was flat, non-tender and without obvious masses. Rectal examination revealed multiple firm polypoid masses. The rest of his systemic examination was normal.

Laboratory investigations were normal, with haemoglobin 13.5 mg/dL. At colonoscopy, multiple pedunculated cherry red polyps were noted mainly in the left side of the colon but there were also large caecal polyps (Fig. 1). Upper

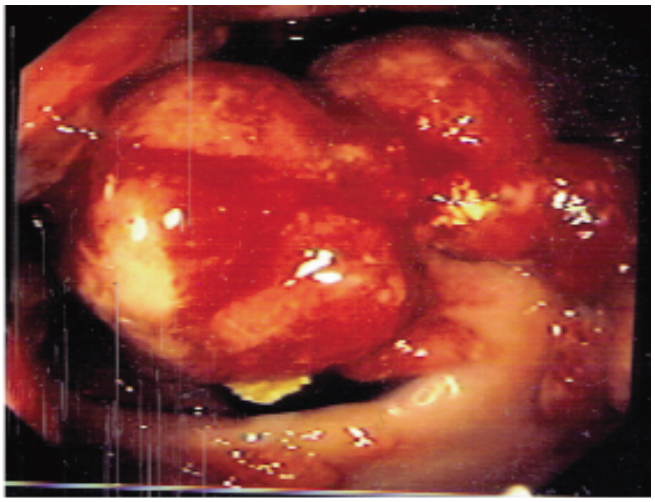

Fig. 1: Large polyps in the caecum

endoscopy was normal. Representative polypectomies were done, which proved to be juvenile polyps on histology. Those from the rectum were typical: exhibiting cystically dilated glands in an abundance of inflamed stroma (Fig. 2). The caecal polyps were atypical, presenting a villiform appearance with branching glands and minimal stroma (Fig. 3). The epithelium was totally benign; no adenomatous changes were observed in either of the two subtypes. A colectomy was advised on the basis that this represented Juvenile polyposis syndrome with numerous polyps.

DISCUSSION

Three forms of familial juvenile polyposis syndrome, all autosomal dominant, have been documented as per the following criteria: a) multiple (3 or more) juvenile polyps limited to the colon and rectum, b) any number of juvenile

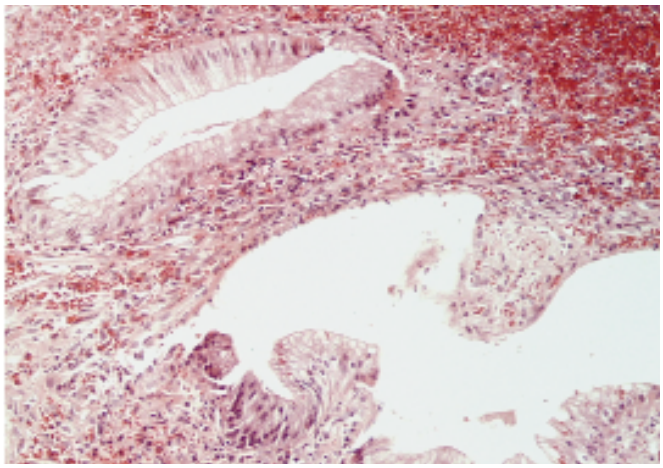

Fig. 2: Histology: Typical juvenile polyp in the rectum.

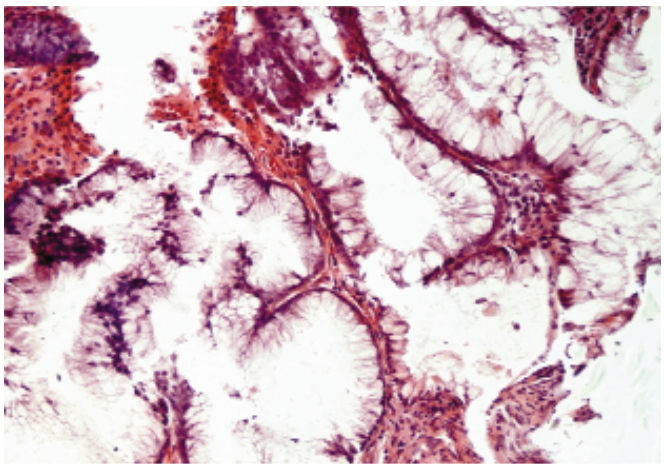

Fig. 3: Histology: Atypical juvenile polyp in caecum.

polyps with a family history of juvenile polyps and c) generalized juvenile polyposis with polyps throughout the gastrointestinal tract (6). Juvenile polyposis syndrome accounts for less than 1% of all colorectal cancer but carries a 40–50% risk of colorectal cancer by the age of 34 years and 68% by 60 years (3). The incidence of gastric cancer has been reported to be 21% in patients with familial juvenile polyposis with gastric polyps (3). The index case had multiple juvenile polyps throughout the colon with a negative family history.

Juvenile polyposis is caused by mutations in at least two genes. Germline mutations in MADH4 (also known as SMAD4, DPC4) encoding SMAD4 account for 15–30% of familial and sporadic cases (7). Mutations in the bone morphogenic protein receptor 1A gene (BMPR1A) may account for an additional 20–40% (7, 8). Both MADH4 and BMPR1A belong to the TGF beta superfamily. Since mutations were not found in more than half of JPS patients in one series, either additional genes predisposing to JP remain to be discovered or alternate means of inactivation of the two known genes are responsible for other JPS cases (9).

Juvenile polyps have an incidence of about 2% in children under the age of 10 years. They are smooth, lobulated, pedunculated, cherry-red polyps, which usually range from few millimeters up to about 3 centimetres. Their surfaces are usually ulcerated and covered by mucus. These features were present in this patient. Histologically, juvenile polyps are classified as hamartomas with expanded lamina propia with dilated cystic glands. In the Juvenile Polyposis Syndrome, a mixture of typical and atypical polyps may be seen, with the latter containing less stroma and more glands often villiform in configuration. In both types, adenomatous changes may occur but more so in the atypical polyps (6).

Juvenile polyposis syndrome has an onset usually by age 10 years but most are diagnosed by age 20 years. Juvenile polyposis syndrome has a male predominance with male to female ratio of 2:1. Patients are usually asymptomatic and the polyp may be an incidental finding or they may present with rectal bleeding with anaemia, abdominal pain, intussusceptions, protein – losing enteropathy, constipation, diarrhoea, or change in stool size, shape and/or colour, or the passage of an amputated polyp. In one series, the mean duration of symptoms was 33 months (10). The index patient had persistent rectal bleeding and prolapsed polyps per rectum for 24 months and he was being treated for haemorrhoids. Although rectal hemorrhoids are very common, other causes of rectal bleeding should be considered especially in young patients. Patients with JPS may have up to two hundred polyps in the gastrointestinal tract, mainly in the colon but the stomach and small intestine may also be involved. There are no characteristic extra-intestinal manifestations.

All affected patients with JPS should be monitored for symptoms and have complete blood count, colonoscopy and upper endoscopy by the age of 15 years. All polyps should be removed if feasible and sent for histological confirmation. Surveillance should be done every three years thereafter. Patients with a large number of polyps or dysplastic changes should be considered for colectomy. First-degree family members should undergo screening colonoscopy and endoscopy at age 12 years and then 3 yearly thereafter (3, 7).

Juvenile polyposis syndrome should be considered in young patients with rectal bleeding and it is important to distinguish between patients with JPS and children with an isolated polyp, as the latter have no malignant potential.

REFERENCES

1. Goodman ZD, Yardley JH, Milligan FD. Pathogenesis of colonic polyps in multiple juvenile polyposis: report of a case associated with gastric polyps and carcinoma of the rectum. Cancer 1979; **43:** 1906–13.
2. Toccalino H, Guastavino E, DePinni F, O'Donnell JC, Williams M. Juvenile polyps of the rectum and colon. Acta Paediatr Scand 1973; **62:** 337–40.
3. Schreibman IR, Baker M, Amos C, McGarrity TJ. The hamartomatous polyposis syndromes a clinical and molecular review. Amer J Gastroenterol 2005; **100:** 476–90.
4. Howe JR, Mitros FA, Summers RW. The risk of gastrointestinal carcinoma in familial juvenile polyposis. Ann Surg Oncol 1998; **5:** 751–75.
5. Giardiello FM, Hamilton SR, Kern SE, Offerhaus GJ, Green PA, Celano P et al. Colorectal neoplasia in juvenile polyposis or juvenile polyps. Arch Dis Child 1991; **66:** 971–5.
6. Jass JR, Williams CB, Bussey HJ, Morson BC. Juvenile polyposis – a precancerous condition. Histopathology 1988; **13:** 619–30.
7. Nagy R, Sweet K, Eng C. Highly penetrant hereditary cancer syndromes. Oncogene 2004; **23:** 6445–70.
8. Sayed MG, Ahmed AF, Ringold JR, Anderson ME, Bair JL, Mitros FA et al. Germline SMAD4 or BMPR1A mutations and phenotype of juvenile polyposis. Ann Surg Oncol 2002; **9:** 901–6.
9. Howe JR, Sayed MG, Ahmed AF, Ringold J, Larsen-Haidle J, Merg A et al. The prevalence of MADH4 and BMPR1A mutations in juvenile polyposis and absence of BMPR2, BMPR1B, and ACVR1 mutations. J Med Genet 2004; **41:** 484–91.
10. Poddar U, Thapa BR, Vaiphei K, Rao KLN, Mitra SK, Singh K. Juvenile polyposis in a tropical country. Arch Dis Child 1998; **78:** 264–6.