Familial adenomatous polyposis: an adolescent with refractory iron deficiency anemia and a mandibular mass

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Abstract

Familial adenomatous polyposis is an autosomal dominant disease that results in numerous colonic polyps resulting in malignancy if left untreated. We report a case of a 15-year-old male with a strong family history of colon cancer who presented with refractory iron deficiency anemia and a mandibular mass. Colonoscopy revealed extensive large lobulated polyps and genetic testing confirmed familial adenomatous polyposis, while computed tomography scan revealed his mass to be a mandibular osteoma, a known extracolonic manifestation of familial adenomatous polyposis. The combination of colorectal and extracolonic manifestations is known as Gardner syndrome. In an adolescent with iron deficiency anemia refractory to adequate supplementation and a strong family history, the diagnosis of familial adenomatous polyposis should be considered.

Introduction

Familial adenomatous polyposis (FAP) is an autosomal dominant disease most commonly caused by germline mutations in the adenomatous polyposis coli (APC) gene on chromosome 5q21-q22.[1] In classic FAP, patients develop more than 100 adenomatous colorectal polyps, typically in the second or third decade of life with progression to colorectal cancer in 100% of untreated individuals.[1] Attenuated FAP (AFAP) is characterized by fewer colorectal adenomas (10 to 99 polyps) with a later age of onset.[1] In children and adolescents, common presenting symptoms include rectal bleeding and diarrhea.[2,3] Genetic testing can establish the diagnosis of FAP or AFAP. Diagnosis of FAP or AFAP should be considered in individuals who present with refractory iron deficiency anemia and in those with a strong family history of colorectal cancer. In addition, these diagnoses should be considered in those with a history of adenomas in combination with known extracolonic features, such as thyroid cancer, desmoid tumors, duodenal adenomas, or osteomas.[1]

Here we describe a case of a 15-year-old male who presented with refractory iron deficiency anemia (IDA) and a mandibular mass who was found to have FAP.

Case presentation

A 15-year-old male was referred to a paediatrician for pallor and fatigue despite an iron-rich diet. There were no symptoms of epistaxis, hematuria, blood in the stool, or rectal bleeding. On further questioning, he had a 4-month history of a left mandibular mass. It measured 2 by 3 cm and was hard, non-tender, and attached to bone. There were no fevers, night sweats, or weight loss.

His family history (Figure 1) revealed that his father had multiple colonic polyps and died at age 38 of colorectal cancer. His paternal uncle had FAP with 500 colorectal polyps on colonoscopy and died at age 36 over 10 years ago, also of colorectal cancer. The patient's younger brother (13 years) and sister (11 years) were healthy. Laboratory investigations ordered by the paediatrician revealed a microcytic anemia (hemoglobin [Hgb] 104 g/L; mean corpuscular volume [MCV] 71 fL) and low ferritin (6 µg/L). He had an elevated reticulocyte count (109 x 10^9/L) and his Hgb electrophoresis was normal. A fecal occult blood test was positive. A hereditary cause for gastrointestinal bleeding was suspected and he was referred for colonoscopy. In the meantime, iron supplementation (ferrous fumarate 6 mg/kg/day elemental iron) was prescribed with good compliance. Shortly after presentation he developed intermittent hematochezia. Despite two months of adequate iron supplementation, his Hgb and MCV remained unchanged and ferritin increased slightly (14 µg/L).

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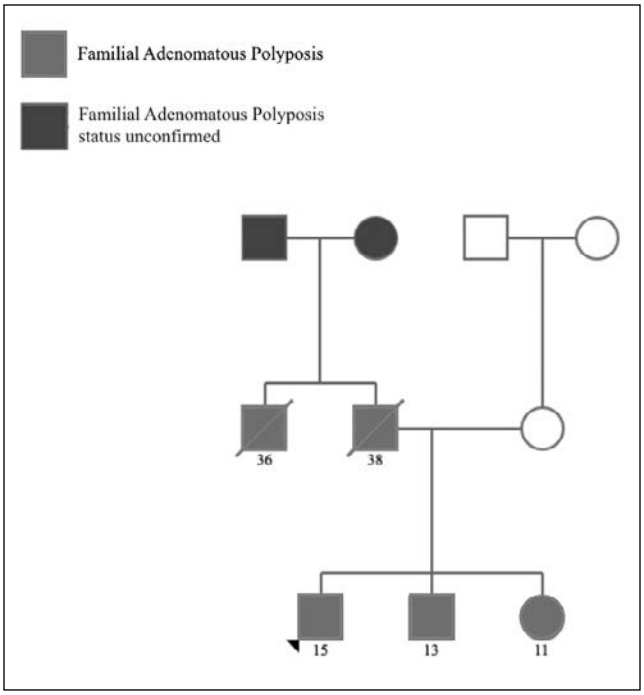

Figure 1. Familial adenomatous polyposis pedigree

A colonoscopy revealed extensive large lobulated polyps. The pathology findings confirmed adenomatous polyps, while his genetic testing for the APC gene confirmed FAP. A computerized tomography scan was done which showed an osteoma of the mandible.

The adolescent's two siblings underwent screening genetic testing and were also confirmed to have FAP. He was subsequently followed by a paediatric gastroenterologist who performed several colonoscopies and has recommended a colectomy because of the extensive polyps.

Discussion

IDA is a common presentation in adolescents; however, in this case, his IDA was atypical from that of most adolescents in that it was refractory to iron supplementation. Children under 4 years of age and adolescents are the two age groups in paediatrics who are at the highest risk of iron deficiency.[4] Iron supplementation (3-6 mg/kg elemental iron/day) should produce a Hgb rise of greater than 10 g/L within 4 weeks for those with Hgb greater than 90 g/L, or within two weeks for those with Hgb less than 90 g/L.[4] Adolescents who do not demonstrate an adequate rise in Hgb should be re-evaluated. If compliance and dosing are both appropriate then the clinician should consider other etiologies such as thalassemia, anemia of chronic inflammation, or a gastrointestinal bleed, and further investigations for IDA should be done. A thorough family history should be taken to rule out hereditary etiologies of gastrointestinal bleeding; if suspected, the patient should be referred for a colonoscopy.

In our case, the adolescent did not have diarrhea and initially did not have any rectal bleeding, which are among the most common presenting symptoms of FAP.[2,3] However, his family history included both a first- and second-degree relative who passed away from colorectal cancer at a young age, and his uncle was confirmed to have FAP. The autosomal dominant pattern of inheritance in FAP means that there is a 50% chance of passing the APC gene mutation to each child. Genetic testing for family members is offered at age 10. Unfortunately, though the uncle in our case was diagnosed with FAP, genetic testing for his family members was missed.

Screening guidelines for patients with classic FAP versus AFAP differ. Individuals with classic FAP should have flexible sigmoidoscopic examination every two years from age 12-14 years.[1] If colorectal adenomas are detected, the patient should have annual colonoscopies.[1] A colectomy is offered if polyps cannot be removed by colonoscopy alone and is eventually necessary in all patients with classic FAP.5 Patients with AFAP can be managed with colonoscopic examination and polypectomy every 2 years from the age of 18-20 years and may never require colectomy.[1] Surveillance for extracolonic malignancies for both FAP and AFAP may include upper endoscopy with side-viewing scope for gastric and duodenal polyps.[1] Surveillance may also include cervical palpation for lymph node involvement and ultrasound for thyroid carcinoma.[5] Interestingly, our patient was found to have a mandibular osteoma which is a known extracolonic feature of FAP. The combination of colorectal and extracolonic manifestations is known as Gardner syndrome.[1]

Conclusion

We report on a case of refractory IDA, a strong family history of colorectal cancer, and hematochezia. Our case reinforces that IDA refractory to adequate dosing and compliance to supplementation should be further investigated, and a family history should be taken. If hereditary etiologies of gastrointestinal bleeding such as FAP are considered, a colonoscopy should be pursued.

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