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INSTRUCTIVE CASE

Blue Rubber Bleb Nevus Syndrome: Extensive small bowel vascular lesions responsible for gastrointestinal bleeding

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Abstract: Blue Rubber Bleb Nevus Syndrome is a rare condition characterised by multiorgan venous malformations, in particular of cutaneous area and the gastrointestinal (GI) tract. We report here a child with chronic iron deficiency anaemia, melena and skin lesions. She had severe hypochromic microcytic anaemia. Upper and lower endoscopy revealed hundreds of red-bluish polypoid lesions involving the entire GI tract primarily of the small bowel. Due to localisation of the most severe lesions, the patient responded well to surgical treatment, allowing a sustained clinical remission.

Key words: Blue Rubber Bleb Nevus Syndrome; gastrointestinal; small bowel.

Introduction

Blue Rubber Bleb Nevus Syndrome (BRBNS), also called cutaneointestinal cavernous hemangioma or Bean syndrome, is an uncommon systemic disorder characterised by cutaneous and gastrointestinal (GI) tract cavernous hemangiomas.[1] GI tract bleeding from lesions within the small bowel are responsible for chronic iron deficiency anaemia, with or without overt evidence of intestinal bleeding, and raise a diagnostic and therapeutic challenge because of the multiple small bowel lesions and their high potential bleeding risk. We report here a case of BRBNS with localisation to a part of the GI tract, which was subsequently removed surgically with no further bleeding in the postoperative (24 months).

Case Report

A 7-year-old girl was referred in January 2007 for recurrent episodes of intestinal bleeding (melena) with chronic iron deficiency anaemia. The patient presented with a history of multiple skin lesions of the lower limbs since birth, which increased in numbers and size over time. Chronic oral iron supplementation and several blood transfusions have been necessary since the age of 4 years, initially without overt intestinal haemorrhage. She had in addition a history of intermittent haematuria. There was no history of haematemesis. Medical history was otherwise noncontributory. The family revealed no history of bleeding problems, venous malformations, polyps, or haemangiomas. The patient had normal developmental milestones. She was not taking medications. On admission to hospital, the physical examination revealed pallor of conjunctiva, melena, no evidence of growth retardation and multiple painless bluish nodular lesions of 0.9 cm in diameter on the trunk and lower limb. These lesions were soft, rubbery and easily compressible (Fig. 1). A small rectal small polypoid mass was palpated on digital rectal examination. Physical examination was otherwise unremarkable.

The laboratory findings revealed a haemoglobin concentration of 4.8 g/dL (normal, 12.7–14.9 g/dL) and a haematocrit concentration of 0.25 (normal, 0.38–0.44) with a mean corpuscular volume (MCV) of 68 fL (normal, 79.0–89.0 fL). The serum iron and ferritin concentrations were low at 29 μg/dL (normal, 35–145 μg/dL) and 19 μg/dL (normal, 24–336 μg/dL), respectively. The blood smear revealed hypochromic microcytic cells without basophilic stippling. The platelet count, the reticulocytes, the coagulation study, liver function tests and albumin results were normal. An upper GI series with small bowel follow through revealed multiple filling defects in the small bowel. Technetium-99m-labelled red blood cell bleeding scan demonstrated areas suggestive of red cell ooze from the ascending colon. Complementary examinations were carried out to search for further haemangiomas in other organs; skeletal

Key Points

1. Blue Rubber Bleb Nevus Syndrome (BRBNS) has extensive small bowel vascular bleeding lesions.
2. The diagnosis and therapy of BRBNS is challenging.
3. The need for a multidisciplinary approach in the management of gastrointestinal tract bleeding, including consideration of aggressive surgical removal.

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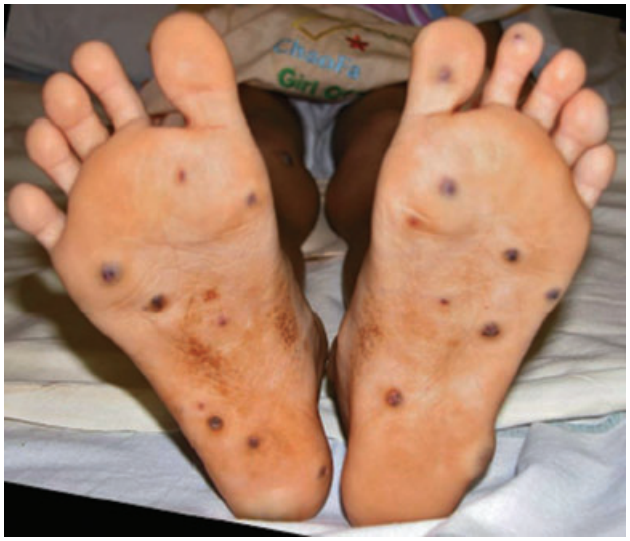

Fig. 1 Skin manifestation of Blue Rubber Bleb Nevus Syndrome: painless bluish, nodular, soft, rubbery lesions of 0.9 cm in diameter on the soles of the feet.

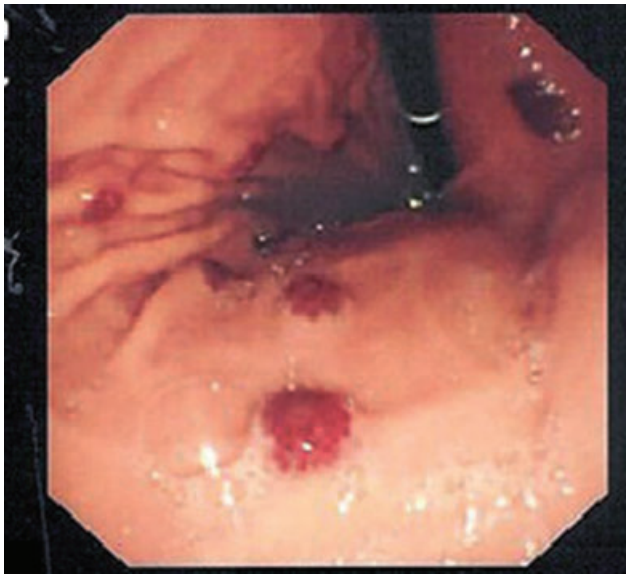

Fig. 2 Endoscopic features of Blue Rubber Bleb Nevus Syndrome: a 20-mm nipple-like, pedunculated sessile vascular lesion in the stomach.

ultrasonography, head computed tomography did not reveal any lesions. However, computed tomography revealed urinary bladder calcifications. Esophagogastroduodenoscopy and colonoscopy were performed. The endoscopic procedures revealed hundreds of 0.5–3.0-cm red-bluish polypoid lesions involving the stomach, duodenum, terminal ileum, cecum, ascending, transverse, descending and sigmoid colon. These vascular malformations were sessile and pedunculated lesions (Fig. 2) but no active bleeding was noted. The size, number and localisation of these lesions did not allow any endoscopic resection; thus, the child was referred for surgical treatment after several blood unit transfusions. A surgical lapratomy was performed, which allowed for all vascular lesions located in the stomach, duodenum, small bowel and colon were removed by combination of segmental resection and suture ligation (Fig. 3). The total numbers of these lesions were 220 and the majority (>100) in the small bowel were resectable. A cystoscpy was completed to remove small haemangiomas in the urinary bladder. No enterostomy done. There were no perioperative or postoperative complications were noted. Histological examination revealed cavernous venous dilatations located in the mucosa and submucosa, with a thin wall of smooth muscle cells lined by a simple layer of endothelial cells. Early postsurgical outcome was favourable, and the patient was discharged 20 days after the surgical procedure. Because there was no progression of cutaneous lesions, the cosmetic operation was not done. The haemoglobin level at discharge was 13.4 g/dL. No recurrence of intestinal bleeding was noted during the 24-month follow-up period, and the haemoglobin level remained within reference range.

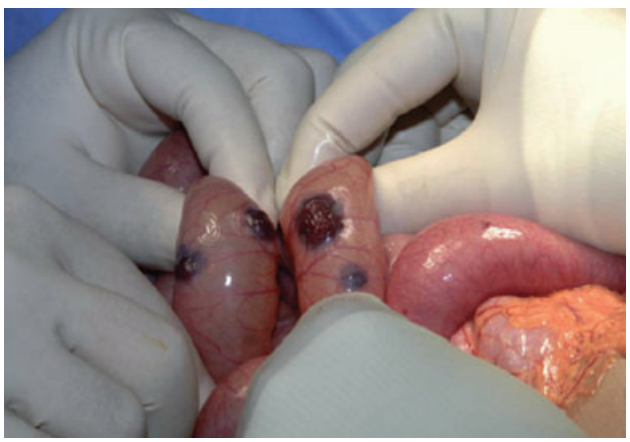

Fig. 3 Operative features of Blue Rubber Bleb Nevus Syndrome: these lesions are similar to cutaneous lesions.

Discussion

BRBNS is a rare condition characterised by multiorgan venous malformations, first described by Gascoyen in 1860[2] and characterised by Bean in 1958.[3] To date, fewer than 200 cases of BRBNS have been reported using MEDLINE search. Although the aetiology and pathogenesis of this syndrome are unknown, an autosomal dominant mode of transmission had been observed in some familial cases with a linkage to a locus located on chromosome 9p.[4]

Cutaneous lesions are usually observed shortly after birth, increasing in size, up to several centimetres, and in number with age and can extend deeply to underlying structures including muscles, joints and bones. The characteristic feature is a 1- to 3-cm nodular rubbery bluish vascular malformation, slightly elevated, which turns to white when compressed.[5] GI tract involvement is thought to be constant in BRBNS with a preferential small bowel and left colonic localisation[6] but lesions may

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be found anywhere from the mouth to the anus. Lesions vary in number from few lesions to hundreds and can also vary in appearance (polylobulated, nodular, sessile, pedunculated and ulcerated).[6] These intestinal lesions may also lead to abdominal pain, intussusception, volvulus, infarction, or internal haemorrhage.[7] The GI tract vascular lesions have a potential bleeding risk, leading to chronic iron deficiency anaemia or overt intestinal haemorrhage. Our patient presented initially with long-standing anaemia and melena appeared subsequently with an increase in blood transfusion dependency.

In addition to cutaneous and GI tract locations, lesions may occur in the oropharynx, nasopharynx, peritoneal cavity, mesentery, liver, lung, glans penis, eye and central nervous system.[8] Histological findings are unequivocal, with characteristic cavernous venous dilatations, located in the mucosa and submucosa, although transmural lesions have also been reported.

The diagnosis of BRBNS is occasionally made in patients with microcytic hypochromic anaemia due to chronic GI bleeding in association with skin nodule. However its diagnosis is essentially clinical, allowing for the determination of morphology, size, and anatomic distribution of all lesions. Various diagnostic techniques include endoscopy, colonoscopy, barium studies, angiography, and scintigraphy; ultrasonography and computed tomography permit the diagnosis of intra-abdominal soft tissue masses.

The management of GI tract haemorrhage in BRBNS is difficult. The therapeutic approach depends on the extent of GI tract involvement and the severity of the clinical presentation. Supportive measures include long-standing iron supplementation with or without blood transfusion. Proton pump inhibitors, steroids and octreotide have all been reported to GI tract blood loss.[9] Several endoscopic therapeutic procedures have been proposed such as laser therapy, plasma argon coagulation, bipolar electrocoagulation, elastic ligation band and polypectomy technique by diathermic snare.[10] Although some authors recommend endoscopic treatment as conservative therapy,[11] these procedures are usually ineffective in case of massive GI tract haemorrhage or in patients with recurrent episodes of bleeding.

The optimal treatment of recurrent or massive GI tract bleeding in BRBNS patients is the surgical removal of venous malformations, either by segmental resection or by a combination of resection, polypectomy, suture ligation and band ligation.[12] In reported cases, the perioperative morbidity is extremely low, and the outcome is usually favourable during several years of follow-up,[12] despite a very few reported cases of recurrence of GI tract haemangiomas after surgical removal.

In the reported patient here, the surgical treatment was decided, considering the localisation and the number and size of haemangiomas and considering the potential risk of endoscopic treatment. The perioperative period was uneventful, and the clinical outcome was extremely favourable after 24 months of follow-up.

In conclusion, our patient was severely affected with hundreds of GI venous malformations of BRBNS and, as a consequence, had chronic, significant GI bleeding and anaemia with a lifelong history of blood transfusion. The surgical removal of all GI tract haemangiomas allowed a sustained clinical remission. In BRBNS extensive small bowel involvement is often the case and is usually a major source of GI blood loss. This observation emphasises the need for a multidisciplinary approach in the management of GI tract bleeding venous malformations, including consideration of aggressive surgical removal of venous malformations of the small bowel.

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