

## CLINICAL CASE - TEST YOURSELF Abdominal Imaging

# An abdominal incidentaloma in a young boy. A challenging ultrasound diagnosis.

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## PART A

A 5-year-old boy presented to our hospital for further investigation of an incidentally found right abdominal mass on an ultrasound (US) examination previously performed as a routine follow-up of his horseshoe kidney.

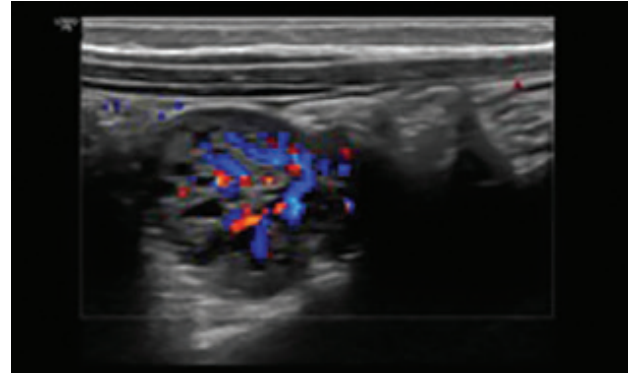
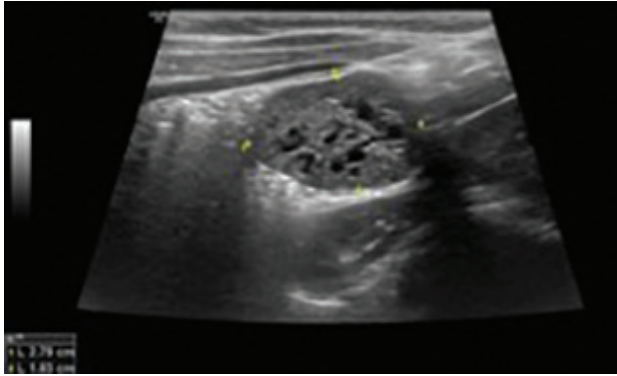
The mass was demonstrated adjacent to the right kidney and was regarded as a right adrenal mass. An abdominal US scan was repeated in our Radiology Department (Fig. 1, 2). The boy had no clinical symptoms or signs.



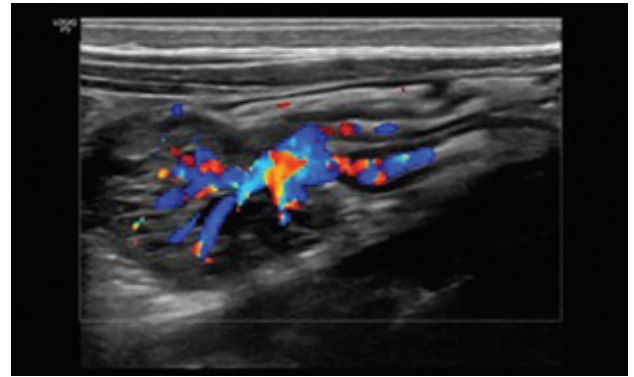
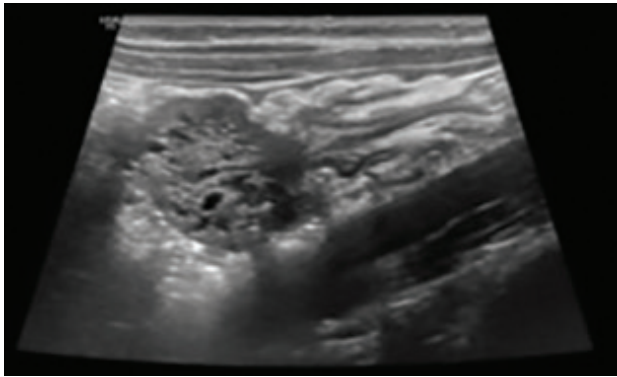
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*Fig. 1. Gray-scale (a) and color Doppler (b) transverse US section of the right lower abdomen.*



*Fig. 2. Gray-scale (a) and color Doppler (b) longitudinal US section of the right lower abdomen.*

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## PART B

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### ***Diagnosis: Intestinal polyp in the ascending colon.***

Abdominal US examination revealed a round-shaped solid hypoechoic mass measuring 2.79 x 1.83 cm, situated at the right lower abdomen, adjacent to the right kidney, which was positioned lower than the left one. The mass was well-defined, with numerous cystic areas within it. With the use of a linear high-frequency (5-12 MHz) transducer, air was observed surrounding the mass, establishing its location in the lumen of the ascending colon. A pedicle extending from the mass to the intestinal wall was identified; with the use of colour Doppler technique plentiful blood flow signals were detected in it. No other abnormalities were found, except for the horseshoe kidney. The adrenal glands appeared normal. All of the abovementioned US findings were suggestive of an intestinal polyp (Fig. 3, 4). The lesion was excised via colonoscopy and histological examination showed a juvenile polyp.

Intestinal polyps are common in childhood, with an incidence of approximately 1% in preschool and school-aged children [1]. Most of them occur in the rectosigmoid colon, whereas the ascending and transverse colon is a less common location [1,2]. They appear as a pedunculated or a sessile protrusion of the intestinal epithelium, and histologically, they can be either hamartomatous or adenomatous. [1]. Solitary juvenile hamartomatous polyps are the most frequent type of polyps in children, representing about 90% of all cases, and are almost always benign [3].

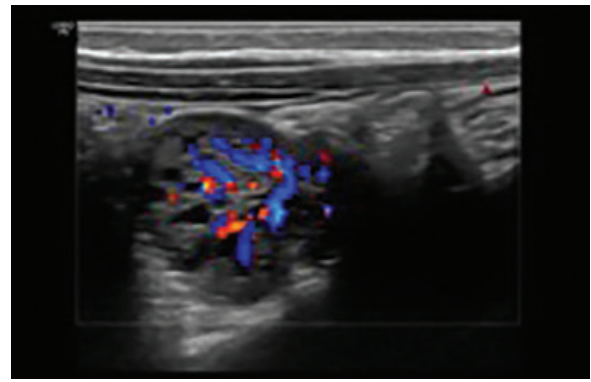
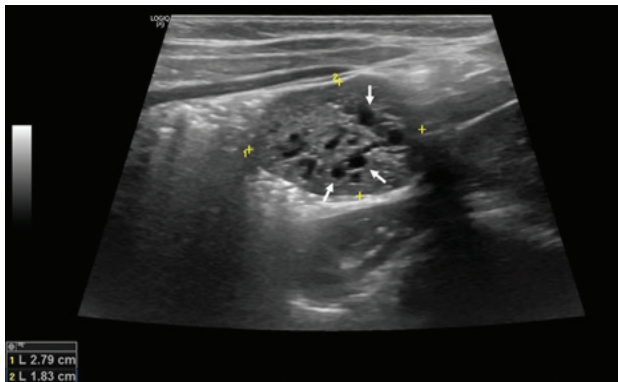
The clinical presentation of intestinal polyps may vary, depending on their size, number, and location. Painless rectal bleeding is the main symptom in children, whereas other associated symptoms include recurrent abdominal pain, diarrhoea, minimal intestinal bleeding, anaemia, or a visible mass prolapsing through the anus [3,4]. Rarely, a large polyp in the proximal colon can serve as a lead point to a colo-colonic intussusception, causing severe symptoms, such as colicky abdominal pain, vomiting, and bloody stools [1,5]. However, in many cases, polyps are asymptomatic and, as in our case, are incidentally discovered on a US exam.

Colonoscopy is considered the gold standard tool for

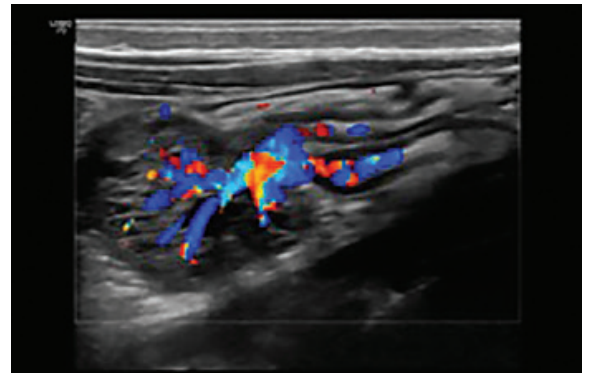
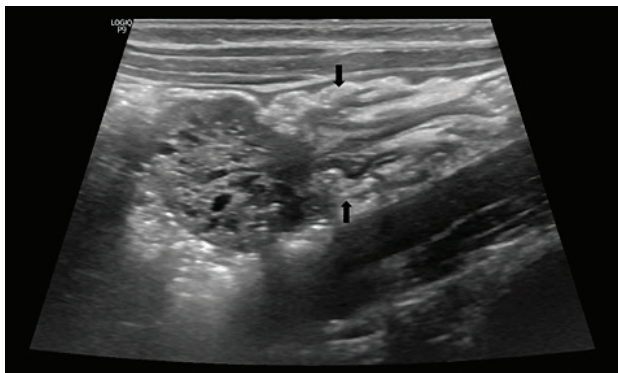
both diagnosis and treatment, but US in the hands of an experienced paediatric radiologist is a highly valuable imaging modality for the diagnosis of polyps, with a reported equally high diagnostic accuracy to colonoscopy [2,6]. However, there are only a few reports of juvenile polyps diagnosed with US in the literature [6,7]. As is well known, the presence of abdominal gas and stools is an obstacle to the detailed US evaluation of the bowel. However, improvements in the US technique, such as graded compression without prior colonic preparation, colonic distention using a saline enema, as well as examination following a glycerine enema or with the colonic segment-approach, have made US detection of polyps more achievable [2,6,7,8]. This fact is of great importance, as ultrasonography is a non-invasive, inexpensive, valid, and accurate technique with no complications, that could be routinely used as a first-line diagnostic method for children with suspected intestinal polyps [2]. Then, a colonoscopy should be performed followed by histological confirmation of the imaging finding, when there are still no symptoms and complications caused by the existing polyp [2,6].

When faced with the discovery of a solid mass with cystic elements in the lower abdomen of a young child, the radiologist should exclude other pathologies with similar US appearance, which are mostly malignant conditions. First, neuroblastoma (NBL) should be included in the differential diagnosis. NBL is the most frequent paediatric abdominal mass, mainly affecting infants and children under the age of 5 years [9,10]. On US, it appears as a hyperechoic heterogeneous mass with internal vascularity, an appearance similar to that of an intestinal polyp. Crucial for the diagnosis is the fact that the presence of cystic elements is quite rare in NBL, whereas calcifications are common. Moreover, given that in most cases abdominal NBL arises from the adrenal glands, their normal imaging appearance is of high importance [9].

Another entity that should be considered in the differential diagnosis of an abdominal mass is nephroblastoma or Wilms' tumour, which is the second most frequently encountered solid abdominal mass in children, most commonly presenting at the age of 3-5 years.



**Fig 1'.** Gray-scale (a) and color Doppler (b) transverse US section of the right lower abdomen. (a) A round-shaped hypoechoic mass with internal cystic areas (white arrows) was revealed on gray-scale US. (b) Color Doppler US (b) demonstrated plentiful blood flow signals into it. It was surrounded almost completely by air, suggesting its intraluminal location.



**Fig 2'.** Gray-scale (a) and color Doppler (b) longitudinal US section of the right lower abdomen. On gray-scale longitudinal US section (a) a pedicle was demonstrated extending from the mass to the colon wall (space between black arrows). Color Doppler US (b) revealed the hypervascularized pedicle and the characteristic abundant branch-shaped blood flow signals within the mass, suggestive of an intestinal polyp.

Its US appearance may resemble that of a polyp, as it is mainly illustrated as a hyperechoic solid abdominal mass, sometimes with cystic areas within it. However, Wilms' tumour is typically large in size, and as far as it constitutes a renal malignancy, its exclusion is ensured only by confirming that the abdominal mass does not arise from the kidney forming the characteristic "claw sign" [10].

In addition, an abdominal malignancy that should be excluded bearing a resemblance to an intestinal polyp on US is Burkitt's lymphoma; it is the most common type of non-Hodgkin lymphoma in childhood, mainly involving the intestine and especially the ileocecal region. What contributes significantly to the differential diagnosis is its characteristic US appearance, as a highly vascularized mass, more hypoechoic compared with an intestinal polyp, with loss of intestinal wall stratification and a central echogenic area, representing intraluminal air. Moreover, mesenteric or retroperitoneal lymph nodes usually coexist [10].

After all, regarding the differential diagnosis, the

key features of an intestinal polyp that the radiologist should look for are as follows: a) a round or ovoid solid hypoechoic lesion protruding into the bowel lumen with hyperechoic margins and a variable number of small cystic areas, which represent mucus-filled glands, b) abundant branch-shaped blood flow signals in the polyp detected with colour Doppler, and c) a hypervascularized pedicle connecting the polyp to the intestinal inner wall with the characteristic mushroom or umbrella sign [8]. The normal morphology of the adjacent structures should be pointed out as well.

In conclusion, the US diagnosis of an intestinal polyp may be quite challenging. The radiologist should be familiar with its distinct US characteristics, to be able to identify them and reach the appropriate diagnosis when the child is still asymptomatic. It should be emphasized that the use of high-frequency linear transducers is of utmost importance for the detailed bowel US examination, which should always be performed independent of the clinical indication for the US abdominal examination. **R**



#### KEY WORDS

children's abdominal ultrasound, juvenile polyp, colonic polyp, incidentaloma

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