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Hepatobiliary ascariasis: ultrasound or CT?

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Abstract
Ascariasis is a frequent and mostly asymptomatic parasitic infestation. The hepatobiliary infestation represents a symptomatic form with severe risk of complication. We report a case of a hepatobiliary ascariasis which was found on a 21 months old boy who presented a right hypochondrium pain. Ultrasound has showed the ascaris into the bile duct, who had moved 24 hours later in the right liver and had rolledon itself, giving a nonenhancing round low attenuation on CT.

Keywords: hepatobiliary ascariasis, ultrasound, moving image

Introduction
Ascariasis is an international public health's problem. However, hepatobiliary complications by migration of the adult worms passing by the bile duct are rare and could cause acute cholangitis, acute cholecystitis, granulomatous hepatitis, and even hepatic abscess [1]. We report a case of a non-complicated biliary colic revealinga hepatobiliary parasitosis diagnosed on US whereas the CT was non-specific.

2. Case history
A 21 months old little boy, weighing 13,39 kg for a height of 85 cm or a body mass index of 14,38 kg/m2, has been addressed to our medical imaging service for a recurrent abdominal pain mostly important at the right hypochondrium area, for 3 days. The child had no fever and there was no icterus. Biology showed an elevation of transaminases (serum glutamyl pyruvate transferase (SGPT) at 226 UI/l), gamma-glutamyl-transferase (173 UI/l) and C reactive protein (CRP) (201 mg/l). Leukocyte count was normal, at 8 giga/l (references: 6 to 16 giga/l). Red blood cell count was normal, at 5,07 giga/l (references: 4,00 to 5,20 giga/l) but the hemoglobin level was low, at 8,90 g/dl (references: 11 to 14g/dl) with a mean corpuscular volume at 58,70 Fl (references: 70,00 to 88,00 Fl), a mean corpuscular hemoglobin concentration at 29,90 g/dl (references: 31 to 36 g/dl) and an average hemoglobin content at 17,60 pg. (references: 23,00 to 31,00 pg.). An abdominal ultrasound was done and showed an important intestinal ascariasis (Fig. 1) and a dilatation of biliary tracts by the presence of an ascaris in the bile duct (Fig. 2). There was no intrahepatic fluid collection. An analgesic and anti-helminthic treatment was begun. Twenty-four hours later, in front of pain persistence and the CRP (301 UI/l) and SGPT (326 UI/l) increase whereas leukocyte count remains normal and hemoglobin level remains low, another radiological assessment including an ultrasound and an abdominal CT has been realized. The ultrasound showed the migration of the ascaris who rolled up in the right liver (Fig. 3) whereas CT showed a nonenhancing round hypodensity, non-specific in the right liver and a focal dilatation of biliary tracts (Fig. 4). There was no abscess sign or intra-abdominal fluid collection. Anti-helminthic treatment has been pursued until 3 days. Abdominal pains decreased from the third day, CRP and SGPT were normalizing on 7th day

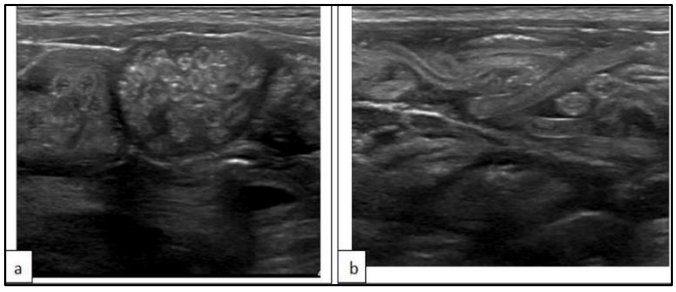

Fig 1: transverse (a) and longitudinal (b) ultrasound section showing ascarides grouped into clusters in the intestinal lumen, giving tiny target-like images in transverse section and rail-like images in longitudinal sections.

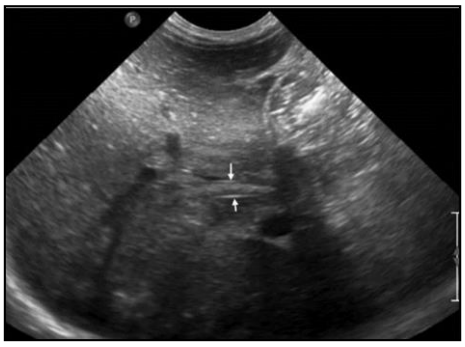

Fig 2: sagittal ultrasound section passing by the bile duct which is dilated and containing a rail-like image made by two hyperechoic lines separated central echoic structure, related to an ascaris (arrows).

Fig 3: transverse ultrasound section passing by the right liver showing the ascaris migration and the roll-up.

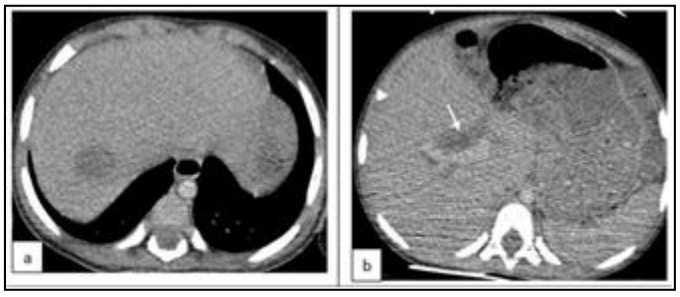

Fig 4: CT axial section showing a nonspecific hypodensity (a) related to the ascaris roll-up seen on ultrasound and biliary tracts dilatation (b) (arrow).

4. Discussion

Ascariasis touches more than 1, 4 billion people over the world [2]. With a maximum prevalence for children of 8 to 14 years old [3]. Adult worms live in the jejunum, but they can migrate all over the intestine especially when there's a lot of them, but mostly without clinical manifestation. In the duodenum, they can pass into the bile duct by crossing the Ampulla of Vater and migrate progressively or return into the duodenum [1, 4]. Then, the bile flow is blocked, and the affection becomes symptomatic with emergence of right hypochondrium pain alike biliary colic. Complications such as acute cholangitis, acute cholecystitis, granulomatous hepatitis or hepatic abscess and even gallstones can emerge if the diagnosis is not set on time [2, 5].

At ultrasound, biliary ascariasis is represented by two hyperechoic parallel "rail-like" lines separated by central hypoechoic structure, in a dilated biliary tract. There is no posterior acoustic shadow. That image is moving with waving or translation moves if the worm is alive [6, 7]. That mobility can be viewed during the same examination or on two follow-up exams. For our patient, the worm moved from the bile duct to the right liver between two ultrasounds spaced of 24 hours. On CT, even if Das [8]. has described that the ascaris in the biliary tract is denser than the bile around, this character is difficult to highlight especially in children where the contrast between the different structures is less. CT only shows an aspect of biliary tract dilatation represented by a non-enhancing hypodensity along the path of concerned biliary tracts. This worm hypodensity is related to the ultrastructure of the ascaris and is more viewed if the worm's digestive system is full [9]. The ascaris rolled-up appearance into the biliary tracts is well-viewed on US especially with a high frequency probe and the moving appearance of the image is authenticated on this examination in real time. The nonenhancing round hypodensity viewed on CT was related to the ascaris roll-up viewed on US, which could be confused with an abscess collection except that there was no enhancement. Although CT is useful in addition of ultrasound in searching for hepatobiliary complications or bowel obstruction related to ascariasis [8]. US remains the technique of choice in the diagnosis and monitoring of hepatobiliary ascariasis. The anti-helminthic treatment is satisfying in non-complicated forms [2].

5. Conclusion

Hepatobiliary ascariasis is a rare disease which constitutes a diagnostic and therapeutic emergency with risk of severe complication. A painful syndrome of the right hypochondrium in children in an ascariasis endemic area must make suspect a hepatobiliary ascariasis. Ultrasound is an accessible and performing radiological assessment for diagnosing and monitoring this disease.

6. References

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