Diaphragmatic hydatid disease: a diagnostic challenge for the radiologist

Kyste hydatique du diaphragme: un défi diagnostique pour le radiologue

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RÉSUMÉ

Le kyste hydatique du diaphragme est une entité rare. Cette localisation hydatique constitue un défi diagnostique pour le radiologue.
Nous rapportons un cas de kyste hydatique primitif du diaphragme non associé à d'autres localisations hydatiques et dont le diagnostic a été obtenu en préopératoire.
Il s'agissait d'un patient âgé de 70 ans sans antécédents médicaux qui se plaignait d'une douleur de l'hypochondre droit depuis 7 mois. L'examen physique et la biologie étaient sans particularités. L'échographie abdominale a montré une lésion kystique multiloculaire qui paraissait localisée au niveau du dôme hépatique et qui évoquait fortement un kyste hydatique. Cependant, la tomodensitométrie abdominale a montré des données en faveur d'un kyste hydatique du diaphragme qui a été confirmé lors de la laparotomie.
Etant donné que l'exploration des lésions kystiques thoraco-abdominales est difficile par l'échographie, une tomodensitométrie avec reconstruction multiplanaire parait indispensable dans le bilan préopératoire d'un kyste hydatique au contact du diaphragme.

Mots-clés

SUMMARY

Primitive hydatid disease of diaphragm is very rare. The preoperative diagnosis of this hydatid location represents a challenge for the radiologist. We reported a case of primitive hydatid cyst of the diaphragm not associated with other hydatid localizations which was diagnosed preoperatively.
A 70 year-old woman with no previous medical history, complained of abdominal pain in the right upper quadrant for 7 months. The physical exam and the laboratory tests were unremarkable. Abdominal ultrasound showed multiloculated cystic lesion which appeared to be located in the hepatic dome suggestive of hydatid cyst of the liver. However, computed tomography showed findings but in favour of the diaphragmatic origin of the cyst which was confirmed peroperatively.
Since the exploration of cysts lying between the thorax and the abdomen is difficult by ultrasound, computed tomography with multiplanar reconstruction appears to be indispensable in the preoperative assessment of hydatid cysts in contact with the diaphragm.

Key-words

Diaphragmatic hydatid disease constitutes a rare condition even in hydatid-endemic areas [1]. If the diagnosis of the hydatid nature of a cystic lesion has become easy since the use of modern imaging, the preoperative diagnosis of the diaphragmatic location of the cyst remains difficult [2].

We reported a case of primitive hydatid cyst of the diaphragm not associated with other hydatid localizations which was diagnosed preoperatively. This case highlights the benefit of computed tomography for the diagnosis of hydatid cysts in contact with the diaphragm.

CASE REPORT

A 70 year-old woman with no previous medical history, complained of abdominal pain in the upper right quadrant for 7 months. The physical exam was unremarkable. Laboratory tests showed a normal range of white blood cell count, an hemoglobin level of 97 g/L and normal liver function tests. Abdominal ultrasound (US) showed gallbladder lithiasis associated with a multiloculated cystic lesion of 8 cm which appeared to be located in the hepatic dome suggestive of hydatid cyst of the liver (Fig. 1,2). Hydatid serological tests were positive. Abdominal computed tomography (CT) showed multiloculated cystic lesion with wall calcifications that forms an obtuse angle with the right hemidiaphragm and displaces the liver inferiorly.

Figure 1: Axial ultrasound slice on hepatic dome showed well-defined anechoic cyst of 8 cm with internal septa (bold arrow) and multiple echogenic foci (thin arrows) inside the cyst which seems to depend on the hepatic dome.

Figure 2: Coronal oblique ultrasound slice on the anterior part of the liver showed multiple septa inside the cyst representing the wall of the daughter cysts (white arrows). The cyst wall is visible as double echogenic lines separated by a hypoechogenic layer (black arrow).

These findings were suggestive of the diaphragmatic localization (Fig. 3,4). The patient was operated on through a right subcostal incision. The hydatid cyst was localized in the right hemidiaphragm and was free from the liver. The cyst walls were fibrotic. Cystotomy, removing of the daughter vesicles and unroofing were performed (Fig. 5) as well as cholecystectomy. The postoperative course was uneventful. Albendazole therapy was prescribed for three months. There was no hydatid recurrence on US performed fourteen months following surgery.

Figure 3: Axial CT showed multiloculated cystic lesion (asterisk) which was surrounded on a part by the diaphragm (thin white arrows), forming the “claw sign” (bold white arrow).

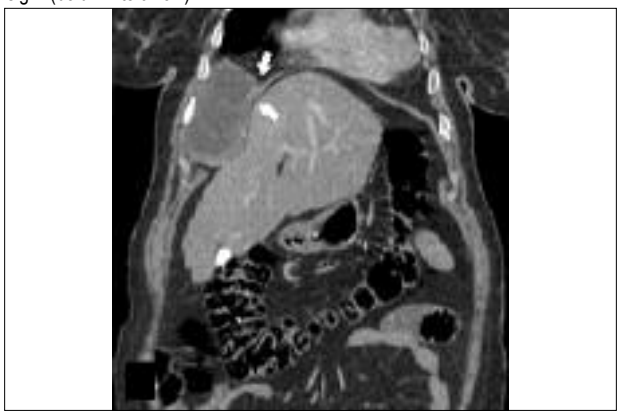

Figure 4: Coronal CT showed cystic lesion with wall calcifications that formed an obtuse angle with the right hemidiaphragm (white arrows) and displaces the liver inferiorly

Figure 5: Intraoperative image showing the diaphragmatic cyst (black arrow) after cystotomy and removing of its contents. The cyst was free from the liver (asterisk)

DISCUSSION

Primitive hydatid disease of diaphragm is very rare [1,3]. Indeed, in addition to the hepatic and pulmonary barriers, the encystment in the diaphragm would be difficult due to the muscle contractility and the production of lactic acid [2]. In addition to its rarity, the difficulty in identifying the exact anatomic location of diaphragmatic hydatid cyst may lead to its misdiagnosis as hydatid cyst of the liver, intrahepatic simple cyst or as other diaphragmatic cystic lesions especially mesothelial cysts and bronchogenic cysts [4]. US is an effective tool for the diagnosis of the hydatid nature of the cyst. Indeed, the existence of daughter cysts into the cyst gives the characteristic multivesicular appearance which is almost pathognomonic of the hydatid origin [4]. However, US can be taken at default to determine the origin of the cyst especially when the cyst extended to both the thorax and abdomen as was the case in our observation. CT is more accurate in determining the diaphragmatic origin of the cyst, mainly on sagittal and coronal reconstructions. The diaphragmatic origin may occasionally be confirmed through some CT findings such as the 'claw sign' which refers to the presence of normal tissue extending around a portion of the tumor, the pattern of organ displacement, and the presence of an obtuse angle between the tumor and the diaphragm [5]. CT also allows to precise the relationship of the cyst with adjacent organs and detect the eventual complications or other thoraco-abdominal localizations. Moreover, contrast-enhanced CT is valuable tool for the differential diagnosis of diaphragmatic cysts. Mesothelial cysts appear as bilobulated homogeneous, non enhancing, well defined cysts of water density [6] whereas bronchogenic cysts appear as cysts with linear and nodular calcifications along its wall with soft tissue density within the lesion [4]. MRI might be helpful in some cases thanks to its superiority in soft tissue resolution and diaphragmatic delineation without recourse to ionizing radiation and IV contrast[5]. Multiplanar imaging allows easier understanding of the orientation of diaphragmatic anatomy and pathologic conditions [5]. Furthermore, regarding the hydatid disease, MRI is the best diagnostic investigation to differentiate the cystic component from the others [7].

The preoperative diagnosis of diaphragmatic localization is useful to adapt the surgical procedure. Indeed, surgery is most often conservative and consists in unroofing especially for large cysts for which radical cure will expose to phrenic repair difficulties [8].

CONCLUSION

The existence of a hydatid cyst lying between the thorax and the abdomen represents a great challenge for the radiologist in determining whether it originates from the lung, the diaphragm or the liver. That is why CT with multiplanar reconstruction appears to be indispensable in preoperative assessment of hydatid cysts in contact with the diaphragm.

Learning points :

• US is accurate for the diagnosis of the hydatid nature of an abdominal cystic lesion but it can be taken at default to determine the origin of the cyst especially when the cyst extended to both the thorax and abdomen

• CT with multiplanar reconstruction is mandatory in the preoperative assessment of hydatid cysts in contact with the diaphragm because:

1. It allows determination of the hepatic, pulmonary or diaphragmatic origin of the cyst.
2. It helps detection of cyst complications or other thoraco-abdominal localizations

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