Repair of Large Diaphragmatic Defect Using Artificial Patch in Hydatid Disease

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To the Editor: Hydatid is an endemic zoonosis disease which brings great harm to the human. It is popular in developing countries especially in North Western China where animal husbandry is the primary industry. For liver hydatid, a few cases may be associated with diaphragmatic muscle invasion, and even invasion into the chest and the right lung, which become more difficult in clinical treatment.

In a recent clinical work, a 64-year-old local female farmer was admitted with pain in the right upper quadrant abdomen ongoing for 1-year. Computed tomography confirmed that there was a cystic neoplasm in the right posterior of the liver with a size about 10 cm × 7 cm × 7 cm, which had clear bounder, closely related to the diaphragmatic muscle [Figure 1a-c].

During surgery, the mass could not be separated from the right side of the diaphragmatic muscle [Figure 1d]. In order to completely resect the mass, we were forced to remove the invaded diaphragmatic muscle which has been totally occupied by the hydatid disease, and repair the diaphragmatic muscle with abdominal patch (UML1, 30 cm × 30 cm, from Johnson and Johnson, USA) [Figure 1f-h]. The pathologic diagnosis was confirmed as hydatid [Figure 1d]. The patient had a smooth postoperative course.

Through the literature review, we found that liver hydatid cysts can rupture into neighboring structures in 15–60% of patients,[1] and most often involves the bile duct, the bronchi, and the peritoneal cavities. Rarely, the involvement of the chest or abdominal wall after liver cysts rupture, which may be challenging to manage. Most of the authors[2-5] have reported some treatment principles or operation methods about the liver hydatid associated with diaphragm or lung invaded. But no article has elaborated how to deal with the invaded and incomplete diaphragm muscle if the patient has a significant defect located in the diaphragm.

According to our experience, liver hydatid disease, especially near the surface of the liver, is often accompanied by the diaphragm muscle invasion, or even resulted in pulmonary hydatid. If the hydatid invaded into the chest through the diaphragmatic muscle, the clearance can not be found between the capsule and diaphragm. Part of the diaphragmatic muscle must be removed if we decide to remove the liver hydatid.

For smaller diaphragmatic muscle defect (diameter of 5 cm and below), suturing and closing it directly is the best approach. While for a larger defect (diameter of above 5 cm), artificial patch materials could be used. The size is chosen according to different clinical needs. One side of the patch covered with smooth membrane, this layer is necessary, and we believed that this part should be put in the chest cavity so as to prevent adhesion; also, it can isolate the chest and abdominal cavity. Even though the diaphragm is an important part of the respiratory muscle, we found that even larger area diaphragm that was replaced by the artificial material, healthy respiratory movement still can be performed under the compensatory of other respiratory muscles such as the intercostal muscle and abdominal muscle. Anti hydatid medicine, such as albendazole should be taken postoperatively.

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Conflicts of interest

There are no conflicts of interest.

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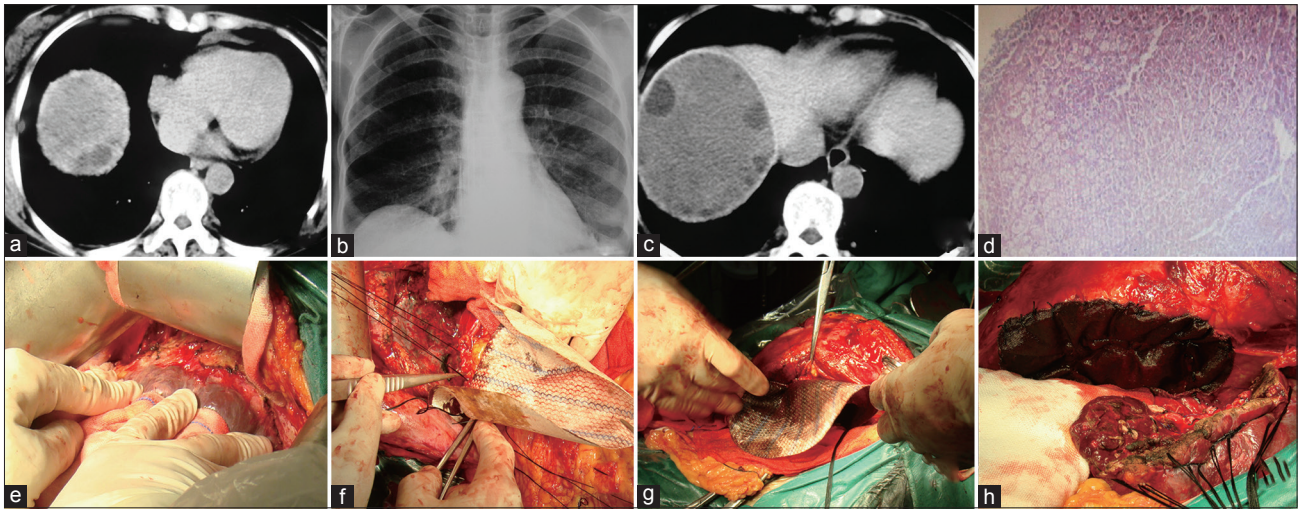

Figure 1: (a and c) There was a cystic neoplasm in the right posterior of the liver with a size about 10 cm x 7cm x 7cm; (b) From the X-ray we can see the right side of diaphragm raised obviously; (d) The pathologic diagnosis was hepatic hydatid desease; (e) The hydatid has invaded the right diaphragm, there is no clearance can be found between the capsule and diaphragm; (f) After resected the right lobe of liver, there is a big hole in the diaphragm, the lung can be seen through the hole; (g-h) After the right lobe resection, the patch was sutured to the defect diaphragm. Also, we can see only left lobe of liver in figure h.

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