Diagnosis and treatment of the hydatid disease of the liver

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Hydatid disease of the liver is a common endemic parasitic condition which prevails in areas of the world where pastoral industry is well developed, and allegedly affects both animals and man. It is commonly found in northwestern provinces of China. A total of nine hundred patients with unilocular hydatid disease had been treated by surgical operation in our hospital between 1953 and 1982, of these, 650 were cases with hydatid cysts in the liver. The diagnosis and treatment of the series of 650 cases is briefly described as follows.

Clinical background

Of the 650 cases, the minority nationalities accounted for 348 (53.6%); males constituted 52.2% (339 cases) and females 47.8% (311 cases); 433 (66.6%) were of single cyst in the liver, 105 (16.2%) of multiple cysts, and 112 (17.2%) of multiple cysts in both the liver and other viscera; 556 (85.6%) harbored the cysts in the right lobe of the liver, 49 (7.5%) in the left lobe, and 45(6.9%) in both lobes.

Diagnostic criteria

1. History of contact
Echinococcosis generally has a high prevalence in pastoral areas where diseased organs are discarded to the dogs. A history of contact with dogs or their contaminated environment is, therefore, suggestive. But with the rapid development of communication in recent years the disease is not confined to pastoral areas, 26.6% of our series of patients were urban inhabitants.

2. Subjective symptoms
Because the basic lesion of hepatic echinococcosis is the space-occupying cystic pressure and the ectocysts of hydatids interfere with the absorption of toxic proteins of cystic fluid, the patient may often have no distinct subjective symptoms in early stage and the liver function is usually not significantly altered. In our series of 650 cases, 103 (15.8%) were of this type. The slow growth of hydatid cysts in the liver led to a sense of bearing-down with bursting and occult pain in the liver region (70.5%), inappetence (60.9%), wasting (55.4%) and anemia (38.3%).
3. Local signs

The parasitism and development of hydatid cysts caused the liver to move downwards and to the left, the enlarged liver being often the first presenting sign (89.4%). When the site of hydatid cysts was in the middle or lower part of the liver, enlarged liver and/or large cysts projecting under the liver might be palpable (77.3%), the characteristic signs being a regular margin, a definite limit, a smooth surface, a hemispherical mass moving up and down with respiration, and no manifest tenderness in the absence of complications. Because of the thicker wall of ectocysts and the higher tension of cystic fluid, the cysts felt hard but pliable and elastic on pressing, and had “hydatid thrill” on knocking. Based on this feature, the disease could be distinguished from other tumors. With the cysts in the upper part of the liver, the diaphragm might be elevated and distended into thoracic cavity and the borderline of hepatic dullness on percussion moved upwards significantly (22.7%). In children, when a liver cyst became large enough to be palpable or visible as an abdominal swelling, the right hypochondrium might be swollen up and the hydatid cyst projected over the costal margin (8.2%) (Fig. 1).

4. Complications

There were 220 cases (38.8%) in this series in which various complications occurred, often concurrently or consecutively in two or more forms.

(1) Hydatid cyst infection

One hundred and twelve cases (17.2%) developed hydatid cyst infection, provoking symptoms like hepatopostema; but the thicker cystic wall might have a great influence upon the infiltration of inflammation into hepatic tissues, the symptoms being milder than hepatopostema.

(2) Hydatid cyst rupture

There were 53 cases (8.1%) with hydatid cyst rupture. ① Twenty-four cases were of rupture into biliary tract, this being the common cause of secondary infection of liver cyst. With rupture into larger hepatic duct, the cystic fluid, daughter cysts and cyst fragments might be liberated into biliary tract, causing acute cholecystalgia and/or obstructive jaundice and complicating, for the most part, secondary acute obstructive and pyogenic cholangitis, with gripping pain, chilly feeling, fever and jaundice more prominent in the latter case. ② Seventeen cases had rupture into abdominal cavity, with cystic fluid escaping into peritoneal cavity, producing acute diffuse peritonitis and anaphylactic reaction.
Rupture into lungs occurred in 8 cases. This appeared in situations where the hydatid cysts at the top of the liver adhered to the diaphragm and the bottom of the lungs following complicating secondary bacterial infection and ruptured into the lungs owing to the penetration of the diaphragm by the inflammatory infiltration, resulting in pulmonary abscess and bronchial fistula, with daughter cysts and cyst fragments in the purulent sputum coughed out. Two cases had rupture into thoracic cavity, with the formation of pleural effusion and anaphylactic reaction. Two cases developed rupture into pericardium, leading to symptoms of pericardial plugging. One case was of rupture out of abdominal wall, forming auto-“marsupialization”.

Anaphylactic shock

It occurred in 10 patients (1.5%), 9 of whom were of cyst rupture into abdominal and 1 into thoracic cavity, but in none of the 34 cases with rupture into biliary tract or bronchus.

Disseminated implantation

Of the 17 cases with cyst rupture into abdominal cavity, 14 developed scolex implantations, with the development of new peritoneal hydatid cysts.

5. Casoni intracutaneous test

The intracutaneous test using clear hydatid fluid, drawn by surgical operation and diluted to 1:100 after inactivation by autoclaving, as antigen was made on 628 patients, 582 of these showed positive reactions, giving a positive rate of 92.7%. Negative reactions were obtained in 46 patients (7.3%), and of relative value in excluding the presence of infection. A positive reaction might still remain significant for several years after removal of endocysts.

Of the 582 patients with positive skin reactions, 146 were of strong positive form. Four patients developed flush, edema and pruritus all over the arm following the intracutaneous injection of the antigen. 23 cases were of delayed hypersensitivity, local erythema or edema appearing several hours later. In the presence of complications with rupture or infection or both, there was a tendency for positive reaction to increase.

As for the false negative reactions, such factors as a single cyst, a short history, small cysts, no daughter cysts or scolices as well as the low titre of cystic fluid antigen used might be concerned; in addition, too long a hydatid disease history, old feeble and degenerative hydatid cysts with decrease in biologic activity and loss of antigenicity, or the interruption of absorption of antigen by the thick calcified wall of ectocysts were also factors that might gradually turn a positive reaction into negative.

False positive reactions were encountered rarely, and it was found that hepatocarcinoma and tuberculosis showed positive reaction.

6. Laboratory findings

(1) Complement fixation test

It gave 84 percent positive reactions in our series of patients, but had cross-reactions
with helminth-like diseases. It became negative about one year after surgical removal of endocysts, and so was significant in judging therapy or recurrence.

(2) Indirect haemagglutination test
It gave 80 to 94 percent positive reactions, had high specificity, and was used in combination with the intracutaneous test (Casoni) as screening.

(3) Eosinophilic granulocytosis averaged 3~10%, but might go as high as 25% in some cases. It temporarily rose after rupture or operation took place, but was a non-specific reaction.

7. Ultrasound examination
(1) Type A ultrasound
As the sound wave passed through the thick and smooth cyst wall, two clear regular saturated high waves were formed, between them was a flat segment of cystic fluid without sound wave reflection. Wave train might appear in the presence of a multitude of daughter cysts or when the cystic fluid had become concentrated after complication with infection, this was to be differentiated from that of hepatocarcinoma.

(2) Type B ultrasound
It revealed a round or oval structure with entire thick cyst wall and coarse surface and a central fluid dark space with regular margin and definite limit. In the presence of daughter cysts, isolated forms could be found.

8. Radioisotope scanning and roentgenography
Radioisotope nuclide scanning showed leftward and downward disfigured displacement of...
the liver configuration, and discrete defects on a larger area, presenting spherical space-occupying changes with regular margin and definite limit. Roentgenography revealed an enlarged outline of the liver. Hydatid cysts at the top of the liver provoked, according to the size of the cysts, a wavy swelling or a hemispherical projection into thoracic cavity in the corresponding right diaphragm part. This could be differentiated from lung cysts by artificial pneumoperitoneum (Fig. 2, 3). Larger cysts produced a pressure on the diaphragm, causing it to be raised and its degree of movement with respiration decreased. Huge hydatid cysts in the right lobe of the liver not only caused the right diaphragm to be raised but also forced the heart to be moved leftwards, and therefore might be liable to be taken as hydatid cysts in the right lung. Cysts in the middle or lower portion of the liver grew towards the peritoneal cavity, roentgenoscopy following barium meal showed that the gastrointestinal tract was pushed to the left and that there were pressure traces in the gastric pit. With a long history of hydatid disease, the ectocysts not only were hypertrophic but displayed different degrees of calcium occupation on roentgenograms (Fig. 4).

9. Rupture of hepatic cysts into peritoneal or thoracic cavity or bronchus
Scolices or hooklets could be found in ascites, pleural fluid or sputum.

Treatment

Surgical operation has hitherto been the principal method of treatment. Its principle is to clean the endocyst, to prevent the cystic fluid from outflow to get rid of anaphylaxis and recurrence caused by scolex implantation, to eliminate residual loculi of ectocysts and to prevent secondary infection. The treatment comprised of removal of endocysts and management of residual loculi of ectocysts.

1. Removal of endocysts
   (1) Removal of endocysts by puncturing
   It is the method most commonly used. After exposing the surface of the liver, 30~50 ml of cystic fluid was first drawn by puncturing for the use of antigen, then an equal volume of a 10% formalin was injected to kill scolices, and the cystic fluid was rapidly aspirated by a needle with a large bore; as soon as the ectocyst collapsed, the endocyst
was detached from the ectocyst, at this time the endocyst and the daughter cysts (there were no daughter cysts in approximately half the cases) were removed by lifting and incising the ectocyst, and the wall of ectocyst was cleaned with formalin and hydrogen peroxide solution. In performing these procedures, the guidelines of "non-tumor operation procedures" were followed. Owing to the fibrous wall of ectocyst formed by liver tissues, there was no boundary layer between them, the ectocyst could not be denuded of its wall and there might be no need for performing an ablation.

(2) Removal of intact endocysts

This is suitable for hydatid cysts which project over the surface of the liver. A crucial incision was carefully performed on the ectocyst wall, being as long as the diameter of the hydatid cyst and the incisures were pulled to make the entire content of the endocyst escape slowly. The endocyst being vulnerable to rupture, close precautions should be taken.

2. Management of residual loculi of ectocysts

According to the size of residual loculi, the thickness of the cyst wall, the presence or absence of infection or biliary fistula, the following procedures were used in surgical treatment:

(i) Closed ectocyst suture, in 514 cases (73.7%).
(ii) Closed greater omentum filling, in 73 cases (10.5%).
(iii) Ectocyst "marsupialization", in 51 cases (7.3%). It was adopted in early years and now is in disfavour.
(iv) Closed drainage with a rubber catheter in residual loculus, in 25 cases (3.6%).
(v) Liver lobectomy or resection, in 18 cases (2.6%).
(vi) Mass resection of ectocysts with residual loculi open, in 11 cases (1.6%).
(vii) Drainage of "Roux-en-Y" method, in 5 cases (0.7%).

In our series of 650 cases, 697 operations were performed, with 6 deaths (0.92%).

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References


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