Minimal access surgery for multiorgan hydatid cysts

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ABSTRACT

Multiorgan hydatid cysts caused by larval growth of *Echinococcus granulosus*, is a rare condition in paediatric age group. There are very few reports of management of multiorgan hydatid cysts, involving lung, liver, and spleen by minimally invasive approach in paediatric age group. Herewith, we are reporting a case of hydatid cysts involving lung, liver, and spleen in a six-year-old child managed by minimally invasive surgery along with the review of literature.

Key words: Minimal access surgery for hydatid cysts, multiorgan hydatid cysts, organ preserving surgery for hydatid disease

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INTRODUCTION

Though endemic in countries where sheep are reared, hydatid disease may be encountered in nonendemic countries as well because of emigrations. Hydatid disease is a parasitic condition caused by the larval growth of "tape worm", *Echinococcus granulosus*. The lung is the most common organ involved in the paediatric age group in approximately 64%; the liver is affected in 28% of the cases.[1] Hydatid cysts normally require 1–5 years to develop, and the diagnosis of multiorgan hydatid cysts in a preschool child is very rare even in highly endemic regions, only a few cases are reported in the literature.[2–4]

CASE REPORT

A six-year-old boy presented with complaints of intermittent history of cough and breathlessness of one-year duration, along with multiple episodes of urticaria and one episode of haemoptysis. He had the history of contact with dogs previously. Clinical examination revealed reduced breath sounds in mid and basal zones on the right side of the chest, with dullness and mild nontender hepatomegaly. Laboratory investigations revealed mild leucocytosis with eosinophilia; however, enzyme-linked immunosorbent assay (ELISA) for *Echinococcus* was negative. Chest x-ray showed a homogenous opacity in the right lower lung zone. Abdominal ultrasonography revealed cysts of varying sizes (average: 7.5 × 7.0 × 4.5 cm), in segment 5 and 6 of the liver (Gharbis classification Type I),[5] and 5.4 × 5.0 × 3.5 cm size in the upper pole of spleen with daughter cysts. Contrast enhanced CT scan of the chest and abdomen revealed cystic lesions of varying sizes involving the right lower lobe of the right lung without any feature of bronchial communication [Figure 1], in the segment 5 and 6 of liver and posterior and superior aspect of spleen, with laminated membranes and daughter cysts [Figures 1-3], suggestive of multiorgan hydatid cysts.

Patient had a course of oral albendazole therapy (10 mg/kg/day) and had operation for the pulmonary pathology. The surgery was performed under general anaesthesia with routine endotracheal intubation and controlled manual ventilation. Thoracoscopic removal of pulmonary hydatid cyst was performed by using two 5 mm ports. To minimise spillage, the cyst was punctured with 16 gauge needle attached to medium pressure (50 mm of Hg) suction apparatus, we were able to aspirate 55 ml of cyst fluid, and then equal amount of scolicidal agent (55 ml of 10% povidone iodine) was injected into cyst cavity and retained for 10 minutes. The cyst was then punctured with a 5 mm suction cannula attached to the suction apparatus at a negative pressure of 50 mm Hg and the endocyst was removed with the aid of negative suction through this closed circuit without causing any spillage of contents into the peritoneal cavity.

Inspection of the cyst cavity revealed an area of air leak; further inspection revealed that the cyst was communicating with main bronchus and the trachea [Figure 4]. We planned to suture the ectocyst with absorbable sutures endoscopically to minimise the air leak, but we had to complete the procedure by a mini thoracotomy incision because of transient drop in

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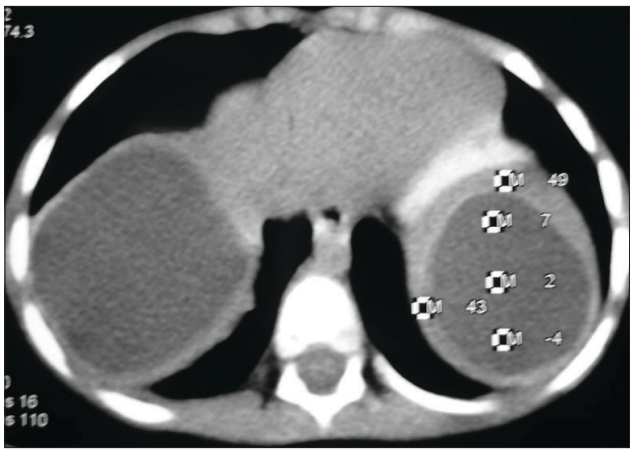


Figure 1: CT scan showing hydatid cysts of lung and spleen

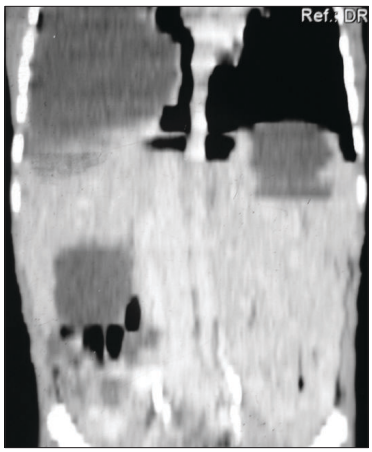


Figure 2: Reconstructed CT scan showing hydatid cysts of lung, liver, and spleen

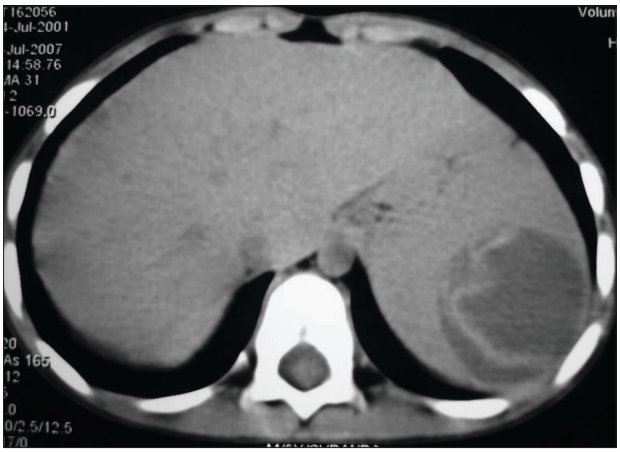


Figure 3: CT scan showing hydatid cysts of spleen with laminated membranes



Figure 4: End-on view of endotracheal tube in the trachea reached via the bronchial communication

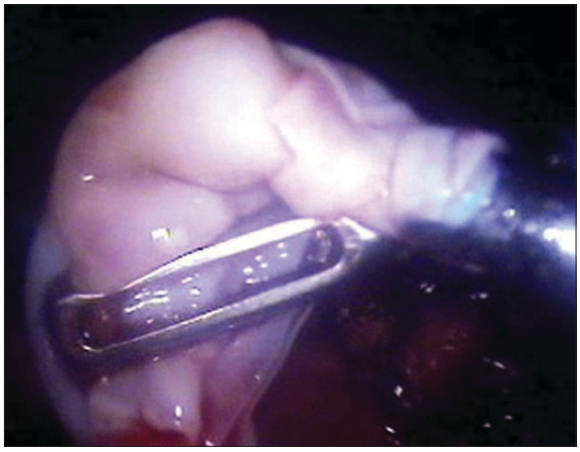


Figure 5: Hydatid cysts being remove by suction cannula from upper pole of spleen

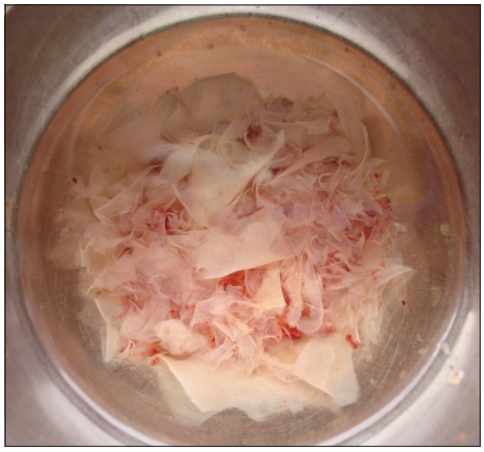


Figure 6: Specimen retrieved from liver and spleen

oxygen saturation and increase in airway resistance. 100 ml of 10% povidone iodine solution was instilled in the pleural cavity and retained for 10 minutes to prevent pleural, as well as, port site recurrence. At the completion of surgery an intercostal drainage tube (ICD) was put in place and connected to under water seal drainage system. Patient made an uneventful recovery and ICD was removed on the second postoperative day and he was discharged on the third postoperative day. Albendazole was continued for three months, and the liver function assessed monthly has remained within normal range.

At three-month follow-up visit, patient complained of abdominal pain and fever, ultrasonography and computer tomography showed no regression in size of liver and splenic hydatid cysts. Hence, we operated laparoscopically using four 5 mm ports, with the same principle of suction connected needle aspiration, povidone iodine instillation, and endocyst removal using medium pressure 5 mm suction cannula, and hydatid cysts of right lobe of liver and spleen were removed [Figures 5 and 6], in the same session. The child made an uneventful recovery and was discharged after the second day of surgery and was continued on oral albendazole therapy for further three months, under monthly liver function test assessment.

We have followed up the patient, every three months, for 18 months now. Clinical examinations and X-ray chest and ultrasonography of abdomen were done at each visit and were normal. We further plan to follow-up this patient at one-year interval by clinical examination, x-ray chest and ultrasonography of abdomen for five consecutive years to look for any new or recurrent lesions.

DISCUSSION

Review of literature has revealed that simultaneous involvement of multiple organs by hydatid cyst is quite rare in paediatric age group with only few reported cases.[2–4] Although response to nonoperative modalities is better in paediatric age group with liver and spleen hydatid cysts, with many large series reporting successful percutaneous treatment.[6-11] But, in cases of lung hydatid cysts, due to inconsistent response, longer hospital stay, and associated complications to the medical therapy and percutaneous techniques,[12] surgery appears to be the main stay of therapy, with consensus on organ preservation,[13–17] for most of these cases. Oral albendazole is recommended in all patients at a dose of 10 mg/kg/day and should be continued for three months in postoperative period to decrease the chances of contamination and recurrence.[15] The role of video-assisted thoracoscopic[14,18] surgeries for pulmonary hydatid and laparoscopic[19,20] surgeries for liver hydatid is well documented; however, we could not find any reference on laparoscopy for spleen preserving surgery for hydatid disease in paediatric age group. Most of the special instruments and techniques for minimal access hydatid surgery is based on the common principle of puncturing the cyst with instruments attached to suction apparatus[20], so as to eliminate the risk of intraoperative contamination. Thus, we conclude that minimally invasive organ preserving surgery is safe and effective option for management of multiorgan hydatid cysts.

REFERENCES

1. Blanton R. Pulmonary echinococcosis. In: Mahmoud AA, editor. Parasitic Lung Diseases. Vol. 101. NY: Marcel Decker Inc; 1997. p. 171-89.
2. Iyigun O, Uysal S, Sancak R, Hokelek M, Uyar Y, Bernay F, Ariturk E . Multiple organ involvement hydatid cysts in a 2-year-old boy. J Trop Pediatr 2004;50:374-6.
3. Kaya Z, Gursel T. A Pediatric Case of Disseminated Cystic Echinococcosis Successfully Treated with Mebendazole. Jpn J Infect Dis 2004:57;7-9.
4. Emilio C, Losurdo G, Mollero L, Giacchino R. Multiorgan echinococcosis in a pediatric patient. Pediatr Infect Dis J 2005;24:660–1.
5. Gharbi HA, Hassine W, Brauner MW, Dupuch K. Ultrasound examination of the hydatic liver. Radiology 1981;139:459–63.
6. Goktay AY, Secil M, Gulcu A, Hosgor M, Karaca I, Olguner M, *et al*. Percutaneous treatment of hydatid liver cysts in children as a primary treatment: long-term results. J Vasc Interv Radiol 2005;16:831-9.
7. Kabaalioglu A, Karaali K, Apaydin A, Melikoğlu M, Sindel T, Lüleci E. Ultrasound-guided percutaneous sclerotherapy of hydatid liver cysts in children. Pediatr Surg Int 2000;16:346-50.
8. Akhan O, Ozmen MN, Dincer A, Sayek I, Gocmen A. Liver hydatid disease: long-term results of percutaneous treatment. Radiology 1996;198:259-64.
9. Gabal AM, Khawaja FI, Mohammad GA. Modified PAIR technique for percutaneous treatment of high-risk hydatid cysts. Cardiovasc Intervent Radiol 2005;28:200-8.
10. Etlik O, Arslan H, Bay A, Sakarya ME, Harman M, Temizoz O, *et al*. Abdominal hydatid disease: long-term results of percutaneous treatment. Acta Radiol 2004;45:383-9.
11. Gargouri M, Ben Amor N, Ben Chehida F, Hammou A, Gharbi HA, Ben Cheikh M, *et al*. Percutaneous treatment of hydatid cysts (*Echinococcus granulosus*). Cardiovasc Intervent Radiol 1990;13:169-73.
12. Symbas NP, Aletras H. Hydatid disease of the lung. In: Shields TW, editor. General thoracic surgery. 5th ed. New York: Lippincott; 2000. p. 1113-31.
13. Cangir AK, Sahin E, Enön S, Kavukçu S, Akay H, Okten I, Yavuzer S. Surgical treatment of pulmonary hydatid cysts in children. J Pediatr Surg. J Pediatr Surg 2001;36:917-20.
14. Mallick MS, Al-Qahtani A, Al-Saadi MM, Al-Boukai AA. Thoracoscopic treatment of pulmonary hydatid cyst in a child. J Pediatr Surg. 2005;40:e35-7.
15. Dincer SI, Demir A, Sayar A, Gunluoglu MZ, Kara HV, Gurses A.Surgical treatment of pulmonary hydatid disease: a comparison of children and adults. J Pediatr Surg. 2006;41:1230-6.
16. Dakak M, Genç O, Gürkök S, Gözübüyük A, Balkanli K. Surgical treatment for pulmonary hydatidosis (a review of 422 cases). J R Coll Surg Edinb 2002;47:689-92.
17. Celik M, Senol C, Keles M. Surgical treatment of pulmonary hydatid disease in children: report of 122 cases. J Pediatr Surg 2000;35:1710-3.
18. Ettaychi F, Benhannou M. *Echinococcus granulosis* cyst of the lung: treatment by thoracoscopy. Pediatri Endosurg Innov Tech 2003;7:67-70.
19. Maazoun K, Mekki M, Chioukh FZ, Sahnoun L, Ksia A, Jouini R, *et al*. Laparoscopic treatment of hydatid cyst of the liver in children. A report on 34 cases. J Pediatr Surg 2007;42:1683-6.
20. Palanivelu C, Jani K, Malladi V, Senthilkumar R, Rajan PS, Sendhilkumar K, *et al*. Laparoscopic management of hepatic hydatid disease. JSLS 2006;10:56-62.

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