

Etienne BFK Odimba¹ MD MMed(Surg), **M. Nthele**² MBChB, FFAS FCS (ECSA), **D. Ndjovu**³ MBChB.

¹Professor of Surgery, Consultant Surgeon, ²Registrar (Surgery), ³Senior House Officer

Department of Surgery, UTH, Lusaka, Zambia

P/B RW 558X, Tel 0026095955200, Fax 00260253050, odimbaetienne@hotmail.com

Key words: Hydatid cyst, Liver. Echinococcosis. Surgery. Abdominal pain.

The discovery of huge and compressing cystic masses on the right liver, associated with right hypochondrium complaints usually presents a diagnostic and management challenge to the surgeon, especially in clinically high risky patients. In this paper we report a case of 65-year old female known diabetic and hypertensive patient presented at Lusaka University Teaching Hospital with chronic right hypochondriac pain and tenderness and was found to have a huge hydatid-like cyst of the right liver. The diagnosis was based on the clinical abdominal and ultrasonography findings. The patient underwent a successful cystectomy with partial pericystectomy. The residual cavity was filled with an omental patch.

This paper reviews the literature and discusses the pathogenesis, diagnosis and the surgical treatment of Hydatid liver cysts, emphasizing the role parasite cycle knowledge, ultrasound and CT scan findings, sterilisation of the cyst and preventive measures to be taken to avoid spread of the disease. The authors also discuss the role of intra-operative cholangiogram as well as the various means of dealing with the residual pericystic cavity.

Introduction

The discovery of right huge and compressive cystic liver masses, associated with right hypochondrium complaints, usually presents a diagnostic and management challenge to the surgeon, especially when the patient is in a high risk category. In this review we report, a case of an elderly known diabetic and hypertensive who presented to us with an extensive Hydatid-like cyst of the right liver and was successfully managed at Lusaka University Teaching Hospital in Zambia. The authors discuss the differential diagnoses, surgical treatment and outcome of the patient with literature review.

Case Report

On 17th May 2004, a 65-year old female, HIV seronegative, presented to Lusaka University Teaching Hospital (UTH) casualty medical room, with a 4-day history of right hypochondriac pain, abdominal distension and cough.

She had apparently been in fair condition prior to admission although she had been having recurrent episodes of abdominal discomfort and cough in past five years. She was a mother of four children and grand-mother of numerous grand-children. She was ten years postmenopausal. She denied any past

history of use of contraceptive drugs, abortion, abdominal trauma, jaundice, blood transfusion or chronic alcoholism. She had never left Zambia for abroad and, even in the country, she had been confined to Northern and Lusaka provinces. She was a known hypertensive patient on Atenolol and Nifedipine since 1977 and a known diabetic treated with Daonil since 2000. On examination she was ill looking, obese, afebrile with mild pallor. The radial pulse rate was 90 beats per minute and full volume.

Her blood pressure was 240 mmHg over 140. Per abdomen, she had right hypochondriac tenderness. Rectal and vaginal examinations were normal. A random blood sugar was 44 mmol per litre.

The patient was admitted in medical emergency ward with a provisional diagnosis of hypertensive crisis associated to diabetes mellitus. A severe liver condition associated to diabetes and high blood pressure was also to consider. Resuscitation included mainly measures to reduce the blood pressure: Hydralazine 5mg slowly administered intravenously every 30 minutes until diastolic blood pressure was 110mmHg or less and dietetic measures including reduction of salt intake. The patient was continued on Daonil 5mg.

Among the investigations done were FBC, ESR, U/E, Creatinine, Chest X-rays and an abdominal ultrasound. The haemoglobin was 10.6 g/dl. The chest X-rays showed moderate basal infiltration of the right lung and a mild enlargement of heart shadow. The abdominal ultrasound scan revealed a huge liver cyst of 101.6 mm almost occupying the whole right lobe with mild internal echoes all suggestive of Hydatid cyst. The liver parenchyma was replaced by the cystic mass and its right lobe was not visible. Some specks of calcification were noted surrounding the cystic mass. The kidneys, spleen and pancreas appeared normal

The hypertension was initially managed with intravenous hydralazine followed by oral anti-hypertensive drugs: Nifedipine 20mg OD retard and Enalapril 20mg OD. However full tenderness remained in the right hypochondrium and the consultation was sent to surgeon on the fifth day since her admission.

Because of persistent severe right hypochondriac pain despite reversal of her blood pressure figures to almost normal and taking in account clinical and ultrasonography findings, an elective exploratory laparotomy was considered with a provisional diagnosis of right liver hydatid. We had the desire to refer the patient for a computed tomogram of liver and for further investigation like compliment fixation but the patient could afford neither the cost nor the delay. For the same reason, we could not postpone the surgery for three to six weeks for prior sterilizing medication of the cyst with Albendazole.

On the 25th/5/2004, after appropriate pre-operative, the patient underwent surgery using right thoraco-abdominal approach through the 9th intercostal space with resection of the rib (Fig. 1). The cyst prominence was located at the 7th and eighth liver segments. The liver was isolated from the other organs with 2% formaline soaked swabs. The overlying liver parenchyma was then incised up to the cyst membrane level and the suction of the cyst started.

After aspiration of some 900mls of tense and clear cystic fluid, instillation of 300 mls of scolicedal formaline was done and left five minutes in the cyst before the definite suction. (Fig. 2). The pericyst was then incised followed by a partial pericystectomy.

Intraoperative cholangiogram could, not be performed. We perfused, under pressure, the common

duct, through a cholecystomy tube, with normal saline to test possible bilio-cystic fistulae. Not any communication with the cystic cavity. was showed (Figure 3).

Because of the partial excision of the residual pericystic cavity and of the difficulty to close or obliterate it by suturing, it got filled in with an omental patch (diagram 4). We maintained the cholecystostomy tube for post-operative cholangiogram and closed the thoracolaparotomy after copious peritoneal toilet.

Fig.1. Thoraco-laparotomy approach using the 9th intercostal space

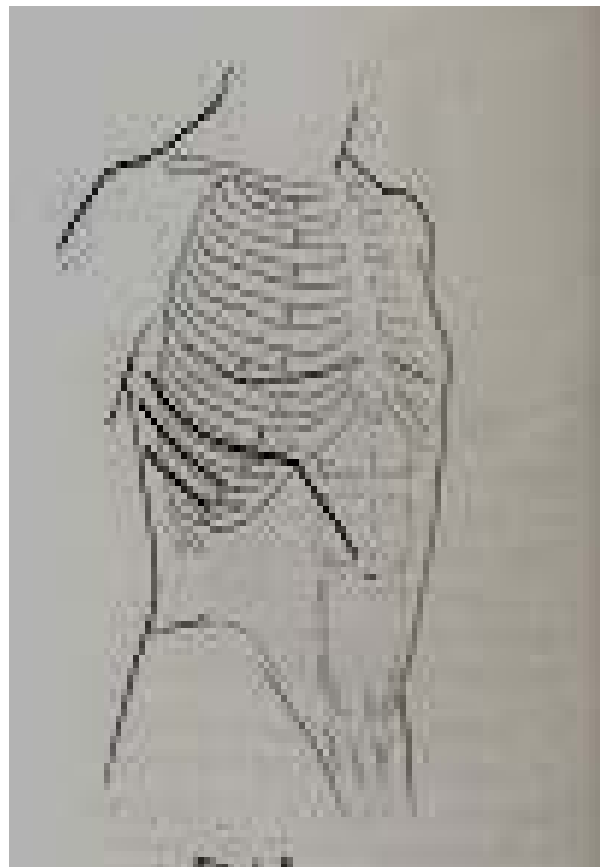


Fig.2. Liver isolation and isolation of biliary

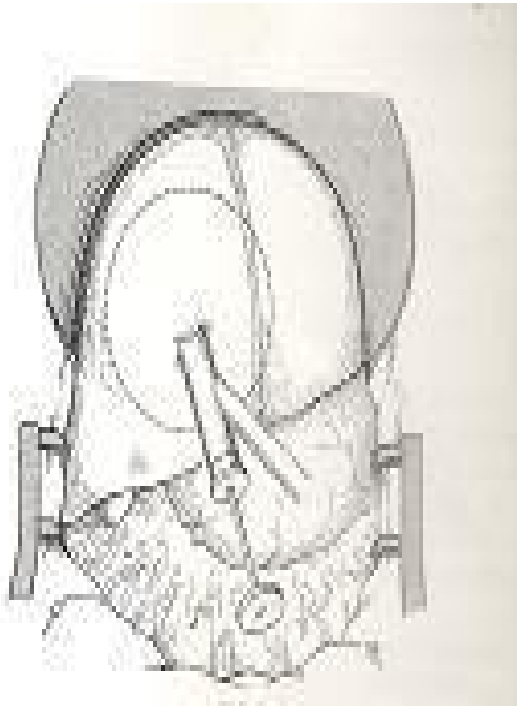


Fig 3. Intra-operative cholangiogram. Absence of biliary fistulae with the cyst.

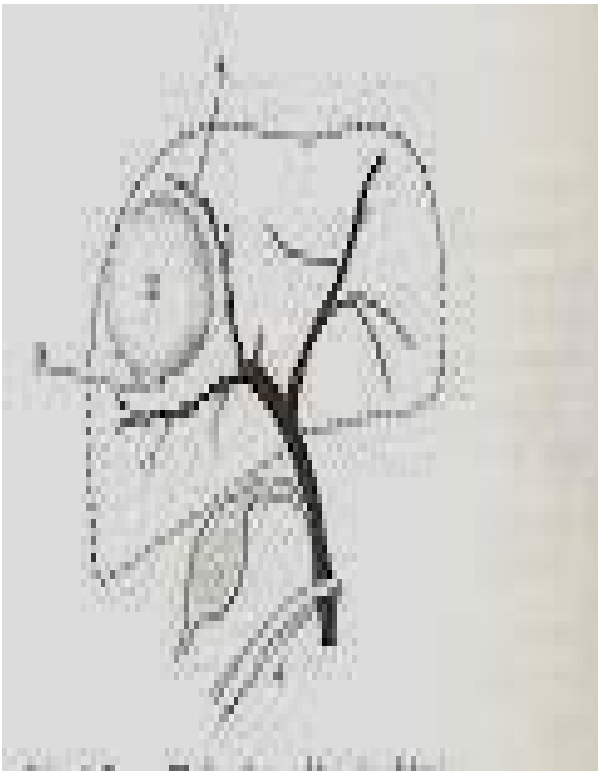
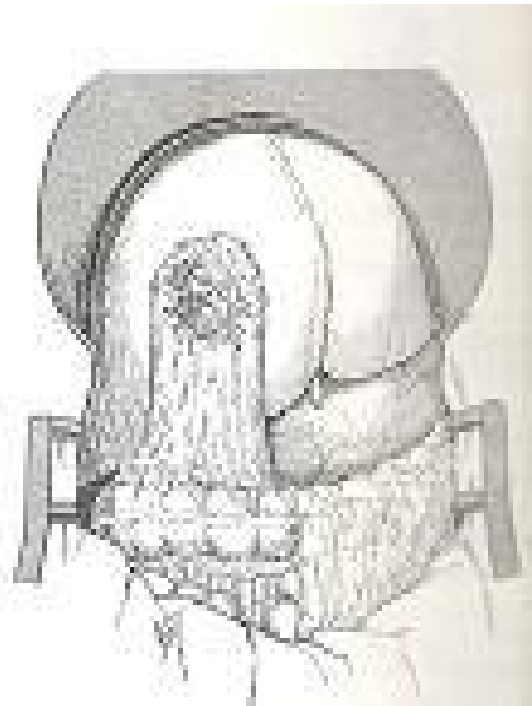


Fig.4. Partial pericystectomy + Omentum patch



Specimens from pericystic membrane and from cystic fluid were sent for histology and microbiology. Immediate and early postoperative recovery was very satisfactory. After one night spent in the UTH main ICU, the patient was transferred to normal in-ward. She received per and post-operatively 800 mls of whole blood. She resumed oral diet on the third postoperative day. She was mobilized from the second day and was ambulant on the fourth. The patient was discharged from hospital on the 6th postoperative day with a soft abdomen, blood pressure between 140/90 and 170/90, haemoglobin of 11g/dl and RBS between 6mmol and 11mol per litre. Histology of the specimen confirmed the diagnosis.

Discussion

Benign tumours of the liver, especially cysts, adenomas and haemangiomas, can be managed successfully. The common recommendation for this treatment is that the liver cyst surgery should minimize the risks for patients and at the same time lower the chance of recurrence.

Pathogenesis, epidemiology

Hydatid disease of the liver is an accidental parasitic infestation of humans by *Echinococcus granulosus*. The disease is still endemic in certain parts of the world like Australia and Middle East where dogs and some wild carnivores (definitive hosts) harbour the flat tapeworm in their intestine. Carnivores (dogs and foxes), when eating intermediate host's organs or viscera, ingest the hydatid cyst. The protoscolices attach to the small intestine and the worms begin to produce proglottids. Gravid proglottids detach from the end of the worm and spill their eggs into the lumen of the intestine.

The eggs pass out in the faeces to contaminate grasses and vegetables. These, when eaten by the intermediate hosts, herbivores (like sheep or cow) will infest them. In the intermediate host, eggs become larval tapeworms after they have hatched the small intestine. These larvae burrow through the intestinal wall and travel to the liver, lung and other organ where they encyst. Man is an accidental intermediate host that terminates the parasite's cycle life. Hydatid disease is not endemic in Zambia. Our patient has never left the country. But the presence of carnivores (dogs and wild foxes) and herbivores (cow and sheep) may lead to indigenous hydatid disease. The disease may become symptomatic even twenty years after infestation.

Clinical Presentation and Diagnosis

The provisional diagnosis of non complicated hydatid cyst of the liver depends on clinical suspicion¹. The main complaint is chronic right hypochondriac pain or discomfort with no obvious source of origin. Complications of hydatid cysts of the liver include, among others internal fistulisation with the biliary tree leading to obstructive jaundice or to recurrent pancreatitis and external fistulisation to the skin presenting as cutaneous abscesses. Accidental spilling may lead to peritoneal echinococcosis.

Ultrasonography usually reveals the nature of the mass: a huge mixed echogenic predominantly cystic mass in the area of the liver. In our case, the liver parenchyma of the right lobe was not visible, having been completely replaced by the cyst. Some speaks of calcifications may be described peripherally. The ultrasound shows, sometimes, a cyst with septations. These septations are well defined and seen if the patient has been referred for computed tomogram. Biological investigations, like complement fixation, should confirm the diagnosis of the echinococcosis, by its positivity.

Principles of Treatment

Theoretically, the modern treatment of the hydatid cyst of the liver varies from surgical intervention to percutaneous drainage or medical therapy. Kumar¹ et al, Saidi² and Maiocchi³. However, it is now of common knowledge that hydatid cyst of the liver must be treated surgically¹⁰ ensure the sterilization of the cyst, avoiding hydatid disease dissemination and to treat the residual cavity and its possible biliary connections: Waghlikar⁴, Bourgeon⁵ Saidi^{2,6} and Kune⁷. The role of percutaneous aspiration and obliteration of the hydatid cyst of the liver using sclerosant recently appeared in the literature, has not yet been unanimously proved: Losanoff⁸ and Filice⁹.

In some uncomplicated and non emergency cases, albendazole should be given at 10mg/kg/day for 3-6 weeks before surgery to sterilize the cyst. After operation, this drug should continue for six to eight weeks to clear any spilled hydatid fluid with possible scolices: Maiocchi³.

The incision takes in account the location and the number of the cysts well provided by modern pre-operative non invasive investigations (Ultrasonography and computed tomography). If the location is not available or remains unclear, supra-umbilical middle line incision is recommended. It will be prolonged or extended the chest according to the liver cyst precised site. In many cases a thoracotomy incision using the 10th or the 9th intercostals space is required. The surgeon starts with the abdominal branch for exploration and then draws the thoracic incision accordingly.

After exposure of the liver cyst, precautions are taken to avoid spilling the hydatid fluid. The operative area is isolated from other parts of the abdomen with scolicidal solution soaked sponges or abdominal packs (povidone iodine). Then the prominent liver parenchyma, covering the cyst, is incised up to the cyst membrane. Suction of cystic fluid with a special syringe is done to reduce the pressure. Then scolicidal solution, like formaline 2% or hypertonic saline (to avoid in hypertensive patients like in our case report), is instilled into the cyst and maintained at least five minutes before the complete suction of the cyst be done. Thereafter, the pericyst is widely incised to extrude the cyst with a wet sponge or swab gauze showing a residual liver cavity with possible biliary fluid. At this stage, an intra-operative cholangiogram through the gallbladder appears useful

to make sure that biliary tree is patent and to show possible cysto-biliary fistulae. If there are daughter cysts in biliary duct, it must be explored, cleared and drained with a T tube. If intra-operative cholangiogram could technically not be done, as in our case, a cholecystomy tube should be inserted to allow postoperative cholangiogram.

Many and various procedures are used to address this cavity according to its location, size and to surgeon's experience. They might be summarized into four groups: the primary cavity closure without drainage, the drainage of the cavity, the filling of the cavity and the suppression of the cavity. Each technique has its advantages, disadvantages, indications and contra-indications which should be well known by the surgeon to predict the outcome and make it successful.

The cyst closure of the cavity without any drainage is done by performing a one layer interrupted or uninterrupted suturing using a number one or two liver catgut sutures. It is mainly done in small size cavity with soft pericyst. It, often, leads to some biliary discharge.

Procedures achieving drainage include external drainage, internal drainage to the intestine directly or indirectly and drainage to the abdominal cavity. The external drainage connecting the cavity with the skin is the classical well known "marsupialisation". It is easy to be performed but recovery usually slow. It might be done using a big size rubber tube.

Cysto-duodenostomy and cysto-jejunosotomy allow direct drainage of the cavity to the intestine. A pre-existing cysto-biliary fistula might be enlarged and associated with a sphincterotomy provides correct drainage of the residual cavity to the intestine via biliary duct. Some peripheral cyst, very prominent might be opened to abdominal cavity after sterilization. The prominent pericyst is excised to allow issue of possible discharge,

Some residual cavities are filled in either by performing "capitonage" or by using an omental patch like in our case, after a partial pericystectomy, to drain possible discharge and activate the healing.

Procedures aiming to suppress the cavity include a partial excision of the pericyst (partial pericystectomy); complete excision of the pericyst with or without cavity closure (total pericystectomy) or an excision of the cavity associated with a substantial liver parenchyma removal (pericysto-resection) Postoperative recovery must be closely followed up as after any major liver surgery: large spectrum antibiotics, vital signs watch, intake out put chart, correction of possible anaemia, nursing care and early patient mobilization.

Conclusion

Liver hydatid cyst disease is still a diagnostic and therapeutic challenge but that can be overcome by surgeon's determination and experience.

References

1. Kumar MJ, Toe k, and Barnerjee Hydatid cyst of Liver Postgraduate Medical J. 2003 79 (928): 113
2. Saidi F. Treatment of ecchinococcal cysts. In Nyhus LM, Baker RJ, Sabiston DC, Eds Mastery of Surgery, 2nd Ed. London: Little, Brown, 1992:818-37
3. Maicchi I, Brunetti E, Filice C Hydatid Liver Cyst Treatment. J Ultrasound Med 2001; 20:1377-9
4. Waghlikar GD, Sikora SS. Surgical Management of Liver hydatid Trop. Gastroenterol. 2001; 22:159-62
5. Bourgeon J (Surgical Management of Hydatid liver Cysts) In EMC Paris 1976
6. Saidi f Surgery of Hydatid Disease. 1st Ed. London: W B Saunders; 1976:22-5.
7. Kune CA, Morris DI. Hydatid Disease. In Schwarts SI, Ellis H, eds Maingot's abdominal operations. 9th Ed. USA: Appleton and Lange, 1990: 1225-40
8. Losanoff JE, Jones JW, Richman BW. Percutaneous drainage for Liver Hydatid Cyst. Can J Surg 2002; 45: 69-70
9. Filice C, Brunetti E. Percutaneous Drainage of Liver Hydatid Cysts. N Eng J med 1998; 338: 392-3