Review

CONTROVERSIES IN THE SURGICAL MANAGEMENT OF HYDATID DISEASE OF THE LIVER

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Introduction

Hydatic disease is widely prevalent in the Indian subcontinent and has been frequently reported from the states of Tamil Nadu, Andhra Pradesh, and Gujarat and with a lesser frequency from Maharashtra, Madhya Pradesh, West Bengal, Himachal Pradesh, Punjab, Uttar Pradesh, Assam, and Orissa [1]. With improved techniques of imaging the diagnosis of the disease has now become more common, and easier and accurate. The liver is the commonest site of involvement, as seen in 50 to 70% of patients. In 3 out of 4 cases, the cyst is solitary [2]. Hepatic hydatidosis is not considered by some authors to be a benign disease as it is progressive, recurrent in 10 to 20% of patient [3,4]. It gives rise to life threatening complications and has a mortality rate of around 10% in recurrent disease [5].

A better understanding of the natural history of hydatid cysts of the liver has shed light on the problems of local recurrence [5,6] a major concern in hydatid liver disease [4], and formation of biliary fistulae the commonest post-operative complication [5]. Medical management has been attempted. However, a multicentre study conducted by WHO suggested that medical treatment be restricted to inoperable cases or for the prevention of post-operative recurrences [7]. Surgery continues to be the treatment of choice [8,9]. The operative technique, however, remains controver-

sial, opinion being divided regarding the benefits of excising the pericyst [3,6,10-12].

Cyst-biliary communications and exogenous daughter cysts

The natural history of the disease is characterised by the progressive growth of the hydatid cyst, which in its natural form is a fluid-filled cavity, delimited by an external dense host fibrous reaction (pericyst) and two internal parasite derived layers (ectocyst and endocyst).

Fig : Natural history of hepatic hydatidosis

Progressive enlargement of the cyst causes pressure atrophy of the surrounding biliary canaliculi leading to cyst-biliary

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communications. These allow passage of the antigenic fluid and scolices down the biliary tract, and the opposite flow of bile and infection into the cyst. These communications have been reported in 42 to 50% of cysts operated upon [12,13]. Infection and intrabiliary rupture of the cyst are the most common complications [14]. Jaundice which occurs in 10% to 15% of patients, is more commonly due to obstruction of the bile ducts by daughter cysts, rather than external pressure [15]. The communications, if not deliberately dealt with during surgery, give rise to bile leaks and their sequelae of choleperitoneum, biliary peritonitis, bile stained pleural effusion, and biliary fistulae (Fig).

Imaging Techniques

Ultrasonography, computed tomography and magnetic resonance imaging confirm that the hepatic mass in question is cystic in nature. These techniques visualize some of the endogenous and exogenous daughter cysts, define the anatomical extent of the cyst and the all-important relationships of the cyst to the major hepatic ducts and vascular structures [16-18]. However, there is no imaging technique which distinguishes a univesicular hydatid from a simple liver cyst. Peripheral curvilinear calcification of the host capsule does not indicate death of the cyst, but that the cyst will turn out to be secondary or multivesicular. A dead cyst has a thick calcified outline as well as crenated irregular calcified contents [15]. Immunological investigations are useful in distinguishing these two conditions.

Dilated biliary radicals, if seen in the preoperative scans of these patients, can be further investigated with endoscopic retrograde cholangiopancreatography (ERCP). A simultaneously done endoscopic sphincterotomy clears the migrated hydatid material from the bile ducts and eliminates the need for common bile duct exploration during surgery [19].

Role of scolical agents

The role of intracystic injection of scolical

agents such as formaldehyde, hypertonic saline and hydrogen peroxide is controversial. In large univesicular cysts, dilution of the scolical agents is unpredictable and probably impairs its efficacy, and in multivesicular cyst the scolical agent cannot be expected to penetrate the hundreds of daughter cysts within the main cavity [5]. In addition, most of the currently employed scolical agents can cause serious complications particularly if the cyst communicates with the biliary system. Sclerosing cholangitis and acute pancreatitis have been reported after the use of formaldehyde solution [20], hypertonic saline solution [21], and silver nitrate [22]. Air embolism and anaphylactic shock may follow the use of hydrogen peroxide [5]. For these reasons most workers have abandoned intracystic injection of scolical agents and consider it "an ineffective ritual which is neither standardised nor reliable" [23].

The percutaneous aspiration of cyst fluid, through normal liver tissue to prevent spillage, and subsequent repeated instillation of 20% saline or 95% alcohol has been recently tried [24,25]. There have been no major complications but the follow up has been short and the incidence of biliary communications is not clarified. The risk of spillage causing dissemination and anaphylaxis, and the toxicity of the scolical agent on the biliary tree, precludes its routine use until more data is available.

Several precautions have been suggested to prevent contamination of the peritoneal cavity during surgery when evacuation of the cyst is deemed necessary. Packing off the surrounding peritoneal cavity with swabs soaked in scolical solution (0.5% solution of cetrimide) isolates the cyst (26). Partial decompression of the cyst, which is usually at a pressure of 300-700 mm of water [2], prevents explosive spillage [27]. Ready availability of multiple wide-tubing suckers is essential, as cyst contents will frequently block suction devices during evacuation [5]. The use of the cryogenic cone or the newer Aaron's suction cone [28] which avoids

cryogenic damage to the liver capsule and adjacent organs makes deliberate evacuation of the cyst relatively safe but requires a wide thoracoabdominal incision to place the cone on the superio-lateral surface of the liver which is a common location of hydatid cysts.

Controversies in surgical strategy

Surgery remains the primary modality of treatment for hydatid liver cysts and options available are detailed in Table 1. There is, however, considerable disagreement about the preferable surgical technique. The major issue of debate is whether complete removal of the peri-cyst is necessary to cure the disease [5,11,12,28,29].

TABLE 1
Surgical options for treatment of treatment of hydatid disease of liver

Conservative	Radical
Enucleation/evacuation	Cystopericystectomy
Capitonnage	total/subtotal
Partial pericystectomy, omentoplasty & external biliary drainage	Wedge liver resection
Pericyst-jejunostomy	Major liver resection
Additional procedures	
Choledochotomy, T-tube drainage	
Sphincterotomy (endoscopic / transduodenal)	
Choledocho-jejunostomy/hepatico-jejunostomy	

Conservative procedures entail the complete removal of the ectocyst and its contents, if possible by enucleation, to prevent spillage. However, this is usually not possible in long standing cysts due to cyst-biliary communications and the ectocyst has to be removed piecemeal leaving the pericyst behind. Conservative procedures are easier to perform, but have a high rate of postoperative complications (upto 28%) mostly due to leaking cyst-biliary communications which give rise to biliary fistulae, choleperitoneum, and infection leading to prolonged hospital stay [5,30]. These are most commonly seen after the residual cavity is managed by capitonnage (approximating the cyst walls with suc-

cessive layers of transfixing sutures [5]). The residual cavity can be managed by opening it widely by performing a partial peri-cystectomy (excision of the extraheaptic portion of the pericyst) so that the cyst-biliary communications can be dealt with by direct suture ligation, followed by omentoplasty which is the technique of choice in most cases of hepatic hydatidosis [12,13,15,28]. In case the omentum is short and the liver soft and pliable, as in children, the technique of introflexion, in which the liver is folded in on itself, can be used to obliterate the residual cavity [31]. However, pericyst-jejunostomy effectively provides internal drainage for the bile leaks and reduces morbidity [30,32].

Radical procedures accomplish complete removal of the pericyst, ectocyst and cyst contents. Wedge liver resection is used for multiple unilobar cysts, or for cysts occupying an entire lobe. Total cystopericystectomy using either the open or the closed technique is the procedure preferred by some workers [5,6,10,12] as it does not entail any sacrifice of liver parenchyma. Closed pericystectomy eliminates the risk of accidental cyst fluid spillage, which can occur even during deliberate, controlled evacuation; however the risk of haemorrhage is higher, as control of hepatic veins is more difficult and is thus recommended only for small, peripheral cysts. Complete dissection of the pericyst is considered to reduce the incidence of biliary leakage as the biliary radicals communicating with the pericyst are more easily identified and safely ligated in the healthy parenchyma. Radical procedures also have a lower rate of recurrence, by enabling the detection and excision of all the exogenous daughter cysts [5,6]. Considerable hemorrhage may be expected during dissection of the pericyst, due to absence of a true surgical cleavage with the liver parenchyma. Clamping the hepatic hilum is useful in decreasing blood loss and is usually not necessary for more than 20 minutes [10]. Magistrelli et al and Nova et al have reported to have had no operative mortality in the 64 and 26 radical procedures undertaken by them respectively [5,12].

TABLE 2

Incidence of biliary fistula following conservative/radical surgery

Study	No.	Biliary fistulae (%)		
		Conservative	Radical	
Demirci et al (1989)	260	27.5	3.5	($p < 0.01$)
French multicentre (1986)	306	32.0	13.0	($p < 0.01$)
Magistrelli et al (1991)	135	14.1	6.2	($p > 0.05$)
Yadav et al (1989)	60	13.6	—	
Tiwary & Tiwary (1988)	27	7.4	—	

During both, conservative and radical, procedures, if clinical features or operative findings suggest biliary tract involvement, operative cholangiography is performed and the migrated hydatid material cleared from the common bile duct through a choledochotomy. A choledochoduodenostomy or a hepatico-jejunostomy is done if complete clearance of the common bile duct is not achieved.

The incidence of biliary fistulae following conservative and radical procedures, in various series [2,6,30,33], are compared in Table 2. Analysis of these figures shows a significant reduction in the morbidity rates following "radical" surgery reported by Demirci et al and the French multicentre study but the same is not true in the series by Magistrelli et al [5]. Yadav et al [30] have reported a 13.6% incidence of postoperative biliary fistulae following conservative surgery till they started performing pericyst-jejunostomies. Tiwary & Tiwary [34] on the other hand had a low incidence of biliary fistulae (7.4%), but 7 (26%) of their 27 patients who underwent conservative surgery developed a sinus which lasted for more than a month. Recently, Novo et al have compared their results of conservative and radical surgery on 113 patients and conclude that the best results of surgery are obtained with an aggressive approach [12].

The recurrence rate following "radical" surgery is also much lower (2%) than after conservative procedures (16%) [5], but the statistical significance of these figures requires to be confirmed by prospective randomized tri-

als. However, most workers are still of the opinion that the use of operative ultrasound to detect exogenous daughter cysts [16], helps avoid a potentially hazardous dissection and that a meticulous search and closure of bile leaks supplemented by omentoplasty continues to be as good, safe and just as successful as cystopericystectomy [3,13,14,29].

Conclusion

Surgery continues to be the preferable therapeutic modality for hydatid cysts of the liver. Medical management is restricted to inoperable patients and for the prevention of recurrence. Although radical procedures seem to offer better control of local recurrence and a lower incidence of postoperative morbidity without increasing the operative mortality, they cannot be termed as the standard surgical treatment for hydatid disease of the liver. Operative strategy has to be tailored to the individual patient, after an accurate pre-operative evaluation of size, number and location of the cysts and their relationship with major blood vessels and biliary radicals, and the presence of extrahepatic disease.

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