

# Nonparasitic cysts of the liver: laparoscopic treatment and long-term results



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## Introduction

The autaptic incidence of non-parasitic hepatic benign cystic disease is estimated between 0.14 and 0.3 % (1, 2). The symptomatic cysts are even more rare (10-15% of the cysts) (3, 4). In the past such pathology has been surgically approached in different ways (fenestration, resection, enucleation, cysto-enterostomies) and at times non-invasively, the results of which were mediocre (5, 6, 7, 8, 9, 10).

In 1991 Z'Graggen and Fabiani proved the feasibility of the laparoscopic approach in the treatment of symptomatic simple hepatic cysts (11, 12). The validity of this technique has been reiterated in other studies (5, 8, 9, 13, 14). The above mentioned papers do not include the parasitic cysts and do not analyze the long-term results (9, 10, 15). From a thorough analysis of the literature becomes evident how most of the complications are observed when the laparoscopic technique is extended to hydatid cysts. Katkhouda in his analysis of 31 cases reports a 66% complication rate for echinococcal cysts compared to negligible percentage in the non-parasitic disease (16). These data, along with other similar reports, make us wondering about the validity of laparoscopy for parasitic disease and the accuracy of preoperative diagnosis.

The difficult preoperative diagnosis, probably derived from an uncommon observation in many countries, has persuaded some authors to exclude laparoscopy as an option for symptomatic simple hepatic cysts in patients

## Abstract

*Background: in the current debate on the indications for the laparoscopic treatment of symptomatic simple hepatic cysts, we emphasize the importance of the exact indications, practicing in an area endemic for hepatic hydatidosis.*

*8 years ago we started treating laparoscopically the simple hepatic cysts and the polycystosis. Although the laparoscopic approach to parasitic hepatic cysts has been recently introduced, this method has to be the result of a conscious choice and with a presumptive diagnosis to support it.*

*In fact, reviewing the literature on the subject, we realized how most of the intraoperative complications were due to an erroneous preoperative diagnosis, likely to be attributed to the infrequent observation of hepatic hydatid disease.*

*Hence, it seems of primary importance to review the subject in light of the potential dangerous aspect of the laparoscopic approach.*

*Methods: from 1992 to 2000 we treated 38 cases of benign liver cystic disease (29 echinococcal cysts, 8 symptomatic simple cysts, 1 polycystosis).*

*Due to the endemic nature of the disease in our territory, the preoperative diagnosis was very meticulous (ultrasonography, CT scan, MRI, serology...). Only 9 cases with a preoperative diagnosis of simple cyst or polycystosis were treated with laparoscopic wide fenestration, combined with cholecystectomy in three cases.*

*The follow-up consisted of ultrasonography in the majority of cases and CT scan in 2.*

*Results: all the 9 laparoscopic cases were uncomplicated and no conversions to open procedures have been recorded. The final pathology confirmed the initial diagnosis in all cases. The follow-up ranged between 1 and 8 years and complete remission has been obtained.*

*Conclusions: the results of this study demonstrate how a meticulous preoperative clinical evaluation can avoid intraoperative complications, making the laparoscopic approach to non-hydatid hepatic cystic disease safe and efficacious. Although laparoscopy is indicated in parasitic liver pathology, the technical approach is very different from the simple cystic disease. In the former, in fact, hepatic resection or pericystectomy are utilized, the results of which have been currently evaluated and compared with the open technique on a large scale on several ongoing trials.*

*Key words: Liver cyst, fenestration, laparoscopy outcome.*

## Riassunto

### **CISTI NON PARASSITARIE DEL FEGATO: TRATTAMENTO LAPAROSCOPICO E RISULTATI A LUNGO TERMINE**

*Nell'attuale dibattito sulle indicazioni al trattamento laparoscopico delle cisti semplici sintomatiche del fegato ci inseriamo sottolineando un particolare aspetto relativo alle esatte indicazioni in un'area ad alta incidenza endemica di idatidiosi epatica come quella in cui noi operiamo. Da otto anni abbiamo iniziato a trattare laparoscopicamente le cisti semplici e le policistosi epatiche. Nonostante recentemente sia stato introdotto il trattamento delle cisti epatiche parassitarie per via laparoscopica, tale via di accesso deve essere una scelta ragionata per non affrontare impreparati una cisti parassitaria senza averne preventivamente circostanziato la diagnosi.*

*Infatti, da una revisione della letteratura abbiamo osservato che una parte degli incidenti intraoperatori in cui sono incorsi alcuni AA erano legati ad una erronea diagnosi preoperatoria, probabilmente riferibile alla infrequente osservazione di patologia idatidea.*

*Ci è sembrato pertanto, particolarmente utile rivisitare il problema che nella chirurgia aperta ha sicuramente una importanza rilevante, ma che in quella laparoscopica può assumere aspetti anche rischiosi*

Parole chiave: Cisti epatiche, fenestrazione, laparoscopia, risultati.

coming from endemic areas, even if the parasitic nature of the cyst has been ruled out preoperatively. This approach seems to be too radical and we believe that it is possible to minimize the preoperative misdiagnosis and to efficaciously select out the patients candidate for the minimally invasive approach.

Our experience based on 86 cases of hepatic echinococcal cyst in the past 25 years suggests that, aside from the approach chosen (laparoscopic versus open), the intraoperative diagnosis of the nature of the cysts has to be avoided. Furthermore, in our era of large immigration it would be very difficult to rely on geographical criteria in order to choose the most indicated approach. Even in those areas considered to be at low incidence of hydatid disease, the problem has to be shifted toward the differential diagnosis prospective.

## Materials and Methods

Between January 1992 and 1999 we laparoscopically treated 9 cases of non hydatid benign hepatic cystic disease, of which 8 simple cysts and 1 polycystosis. The laparoscopic approach consisted of cystic fenestration in all 9 cases. All the patients were females of age ranged

between 42 and 72 years (mean 58). The solitary cysts were mostly located in the right lobe of the liver (7) and the mean diameter was 11.5 cm (range 8-16 cm). All the patients presented with right upper quadrant pain and three with associated nausea and early satiety. In none of the cases we noticed dyspnea, caval compression symptoms, jaundice. Previous laparotomies were not considered contraindication to the laparoscopic approach. One case required an extensive laparoscopic adhesiolysis. In 3 patients laparoscopic cholecystectomy was necessary due to the dense adhesion and close contiguity between the cyst and the gallbladder.

The preoperative work-up included liver function test, tumor markers (CEA, CA 19-9, a-fetoprotein, TPA) and urine hydroxyindolacetic acid. The specific serology for Echinococcus has always been considered key in the diagnostic process, even if its sensitivity was only 80% in our experience (6/29 cases of hydatid was negative). Imaging modalities included primarily ultrasonography, followed by CT scan. Dedicated specialists meetings were called in effort to minimize diagnostic errors. This prudent approach on one hand allowed us to zero the false negative rate, but gave us 2 false positive results. The false positive result had less impact from a morbidity and mortality standpoint and the only downside of that was the non-correct exclusion of the patients from a laparoscopic approach.

MRI was utilized in only 2 cases (one simple cyst and one polycystosis). Intraoperative US has gained favors in the past three years, not only as a mean to confirm the diagnosis, but also as an invaluable mean to define the relationship between the cysts and the surrounding structures (portal and suprahepatic veins, bile ductules etc.), especially in case of deeply located cysts.

The laparoscopic technique was similar in every case. A 30-degree laparoscope and a pneumoperitoneum at 14 mmHg were utilized. The solitary cysts were aspirated first and a biopsy taken for frozen section. Once the pathology was confirmed, the fenestration was carried out by bipolar scissors, resecting the entirety of the cystic dome up to 3-5 mm from the hepatic parenchyma. In the last 2 cases the harmonic scalpel has been utilized.

Although it was never necessary to apply clips or sutures for hemostasis, the vascular endoGIA 30 was utilized in few cases. The intraoperative cholangiogram was omitted in those cases in which no bile refilling of the residual cavity was observed. Neither sclerotherapy nor omental patching was used. We did not have any intraoperative complications or conversion to open procedure. The mean OR time was 80 min (range 45-180 min). A total of 3 cholecystectomies were necessary. A closed drainage system was utilized in every case and removed 48-96 hours post operatively. No prolonged ascitis is reported. The mean hospital stay was 5 days (range 3-7 days).

The final histo-cytological diagnosis on both the cyst wall and fluid confirmed the simple nature of the cyst and excluded the presence of bile.

The mean follow-up was 3.5 years (range 1-8 years); 4 patients had a follow-up longer than 5 years. The follow up consisted in both physical exam and ultrasound. However in 2 cases a CT scan was required for the following reasons: in one case of polycystosis to monitor the volume of the remaining cysts and to rule out cyst refilling in the other case. CT scan confirmed the US findings.

## Discussion

The wide spread availability of ultrasonography allows us to diagnose an increasing number of solitary hepatic cysts. The indication for surgical treatment is limited to the symptomatic ones or the ones suspected to harbor malignancy (5-15%) (17, 18). Emergency surgery is rarely required in these cases and it is limited to the acute complications.

In the majority of the cases the symptomatology is non-specific, deriving from the compression of the surrounding structures (portal hypertension, jaundice, dyspnea, lumbar pain, abdominal distention, dysuria) (1, 19, 20). One of the most consistent findings is right upper quadrant pain, which requires accurate work-up to exclude more common pathologies: cholelithiasis, gastro-esophageal reflux disease (GERD), peptic ulcer disease (PUD). The mere presence of a hepatic cyst calls for a meticulous differential diagnosis. From a diagnostic standpoint, a detailed history and ultrasonographic and tomographic images are usually sufficient to distinguish between purely cystic lesions and other pathologies with cystic components such as primary or secondary neoplasms, abscesses and chronic hematomas. Differentiate between simple cysts and polycystosis from hydatid cysts is less straightforward, especially when the pathognomonic features of the hydatid cyst are absent (i.e. membrane detachment, thick hyperechoic wall, and hydatid sludge). It is essential to establish the nature of the cyst prior to the operating room to avoid intraoperative "surprises". In our opinion this aspect has been underestimated by many clinicians and has led to operative failures on one hand and exclusion of laparoscopy based solely on the geographical origin of the patient on the other. Beside the typical simple cyst, round anechoic with regular margins and posterior wall reinforcement on ultrasonography (21) it is not uncommon to find others with an apparent septation that are difficult to distinguish from the hydatid cyst.

The presence of septa, in fact, is not a common feature of the simple cysts, but multiple contiguous cysts can simulate it. Since in our region hydatid disease is endemic the differential diagnosis becomes once again essential.

The typical appearance on CT scan of simple cysts is of a well-defined, space occupying, spherical or rounded shaped, thin walled neoformation, with a density close to water (0-5 *Hausfield*) and modest enhancement after

contrast injection. The injection of intravenous contrast allows the manifestation of a possible communication between the cyst and the biliary tree. The calcifications seen on CT scan are non-specific, these being present in echinococcal cysts and in malignant lesions, as well as in simple cysts.

Controversy exists on the utility of the cyst content microbiological and chemical analysis, favored by D'Amico (22, 23, 24, 25) and opposed by Brandt (26). Although we did not find such analysis indicated in our experience, it could be applied in case of deeply located lesions not suitable for the laparoscopic approach.

The MRI is especially useful in the complex cases because its ability to identify an hypointense pseudocapsule characteristic of the echinococcal cyst (23, 24, 25).

In regards to the technique, has to be noted how the laparoscopic fenestration represents the minimally invasive correspondent of the Lin technique. The clear advantage of the former is due to a more balanced proportion between the extent of the approach and the severity of the disease. The formal laparotomy implies early (wound infections, postoperative pain) and late postoperative complications (ventral hernias, adhesions) that overcome the benign nature of the disease and the simple operative intervention required.

The main disadvantage of the minimally invasive approach is linked to a non-accurate pre operative diagnosis. This disadvantage is clearly present also for laparotomies, but it doesn't have the same unfavorable impact. By analyzing the current literature becomes evident how the majority of the complications is present in case of non-resective treatment of hydatid cysts, done by mistake or by choice. The complication ratio between simple asymptomatic and hydatid cysts is 1:6.

The polycystosis represents a different problem due to the nature of the disease with multiple, deeply placed cysts, covered with thin layer of liver parenchyma. The need for second-look surgery for simple cysts is confined to symptomatic refilling or the new onset of symptomatic cysts, hence very rare. The opposite is true in case of polycystosis, in which the rate of symptomatic recurrence is up to 25-57%, sometimes requiring liver transplantation (13, 25). Zacherl reports a recurrence rate between 0 and 38% (8, 9). This shows how the data on recurrence rates are difficult to interpret due to a lack of uniformity of parameters utilized (location, type and nature of the cyst, follow-up duration, interpretation of symptoms).

After a follow-up of at least 5 years, our rate of symptomatic recurrence is zero.

In fact the 2 cases of cyst refilling have been observed during routine follow-up and not because of specific symptoms.

In the immediate post operative period we did not observe biliary leakage nor pseudocyst formation, even if we did not oversee the fenestration margin or use omental flap (17), disagreeing with the indications.

## Conclusion

Based on our data compared with the current literature, we can conclude that great caution is mandatory when uncertainty on the nature of cyst still persists after the appropriate work up.

Laparoscopy is certainly the preferred approach in case of symptomatic non-parasitic cysts.

The laparoscopic wide fenestration is indicated in incidentally found asymptomatic cysts. The choice of the laparoscopic approach is determined not by the size but by the location of the cysts, being limited to those located in the segments II, III, IV, V and VI.

A selective approach has to be taken in cases of polycystosis. We recommend such technique only for the anteriorly located symptomatic cysts and when the rest of hepatic parenchyma is not significantly compromised. In accordance with Katkhouda (16), we discourage the use of laparoscopy in the presence of hepatic cirrhosis. With such a cautious and selective approach, the laparoscopic treatment of simple hepatic cysts becomes not only feasible, but also safe and with good long-term results.

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**Commento**

**Commentary**

Prof. Ercole CIRINO

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*Il lavoro si inserisce nel panorama moderno dell'approccio laparoscopico alle cisti epatiche.*

*A buona ragione gli AA sottolineano l'importanza di una diagnosi differenziale accurata, soprattutto nella nostra regione in cui la malattia idatidea è ancora presente.*

*Ad una esposizione, aggiornata e precisa, delle indicazioni e della metodologia si accompagnano i dati di un follow-up a lungo termine che avvalorano i presupposti teorici della metodica di fenestrazione laparoscopica.*

*The study can be included in the current debate on laparoscopic treatment of hepatic cysts. The authors underline the importance of an accurate differential diagnosis, especially in our territory where hydatid disease is still well present.*

*Along with a meticolus and updated review of the indications and methodologies, are included the data from a long follow-up. Altogether these data validate the efficacy of the laparoscopic fenestration.*

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