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Living FRiendly Summaries of the Body of Evidence using Epistemonikos (FRISBEE)
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Laparoscopy or open surgery for the treatment of hydatid cyst?

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Abstract

The laparoscopic approach has taken a prominent role in the last decades for various surgical conditions, including liver hydatid cyst. However there is controversy about whether it can replace open surgery. Using Epistemonikos database, which is maintained by screening 30 databases, we identified three systematic reviews which together include four relevant studies, none of them randomized. We combined the evidence using meta-analysis and generated a summary of findings table following the GRADE approach. We concluded it is unclear whether laparoscopy for hepatic hydatid cyst reduces mortality, morbidity or recurrence compared with open surgery because the certainty of the evidence is very low.

Problem

Hydatid cyst or hydatid disease is a zoonosis caused by Echinococcus granulosus. It is widely spread throughout the world, with endemic areas in the Mediterranean, South America, New Zealand, Australia, among others [1]. It may compromise multiple organs, but the most commonly affected is the liver. There are various treatments, from medical management with anthelmintics to more aggressive treatments such as surgery, which is currently considered as standard of treatment [2]. This can be done by radical surgery (hepatectomy or pericystectomy) or conservative (cystectomy, deroofing, omentoplasty, among others). Radical surgery has shown the lowest long-term risk of recurrence [2].
With the development of minimally invasive techniques, laparoscopic approach has taken a prominent role in various surgical conditions, including hepatic hydatid disease.

Methods

We used Epistemonikos database, which is maintained by screening more than 30 databases, to identify systematic reviews and their included primary studies. With this information we generated a structured summary using a pre-established format, which includes key messages, a summary of the body of evidence (presented as an evidence matrix in Epistemonikos), meta-analysis of the total of studies, a summary of findings table following the GRADE approach and a table of other considerations for decision-making.

Key messages
- It is unclear whether laparoscopy for hepatic hydatid cyst reduces mortality, morbidity or recurrence compared with open surgery because the certainty of the evidence is very low.

About the body of evidence for this question

What is the evidence. See evidence matrix in Epistemonikos later	We found three systematic reviews [2],[3],[4], which include four studies relevant to our question, none of them randomized. Three were retrospective [6],[7],[8] and one prospective [5].
What types of patients were included	The studies included patients older than 10 years with active liver hydatid cyst (cysts type I to IV or CE1 to CE4). One study [8] excluded patients with cysts located in segment 1 and 7 and with evidence of intrabiliary rupture. None of the studies included emergency surgery for complicated cyst.
What types of interventions were included	All studies compared laparoscopy versus open surgery [5],[6],[7],[8]. Regarding the different types of surgery, studies divided it into conservative surgery where only the membrane was removed and pericystic parasite remained in the liver, and radical procedures including pericystectomy and liver resection. Two studies [6],[8] included only conservative laparoscopic management in the laparoscopy group, and one study [8] did not include radical surgery in the open surgery group.
What types of outcomes were measured	Perioperative mortality and morbidity, relapse and hospital stay were compared across studies included in the summary. They also measured general complications such as fever of unknown origin, subcutaneous hematoma, pleural effusion or empyema, pneumonia, atelectasis, drug induced fever and hyperosmolar coma.

Summary of findings

The information on the effects of laparoscopic hepatic hydatid disease management is based on one prospective and three retrospectives studies including 486 patients. All studies reported the outcomes mortality, perioperative morbidity and recurrence.

- It is unclear whether the management of hepatic hydatid cyst by laparoscopy reduces mortality compared with open surgery because the certainty of the evidence is very low.
- It is unclear whether the management of hepatic hydatid cyst by laparoscopy reduces morbidity compared with open surgery because the certainty of the evidence is very low.
- It is unclear whether the management of hepatic hydatid cyst by laparoscopy reduces recurrences compared with open surgery because the certainty of the evidence is very low.

Laparoscopic versus open surgery for uncomplicated hepatic hydatid cyst				
Patients	Active hydatid cyst			
Intervention	Laparoscopy			
Comparison	Open surgery			
Outcomes	Absolute effect*		Relative effect (95% CI)	Certainty of the evidence (GRADE)
	WITH OPEN SURGERY	**WITH LAPAROSCOPY**		
	Difference: patients per 1000			
Mortality	10 per 1000	8 per 1000	RR 0.8 (0.10 to 6.61)	⨁◯◯◯[1,2] Very low
	Difference: 2 patients less per 1000 (Margin of error: 9 less to 57 more)			
Morbidity	258 per 1000	114 per 1000	RR 0.44 (0.25 to 0.78)	⨁◯◯◯[1,2] Very low
	Difference: 144 patients less per 1000 (Margin of error: 60 to 196 less)			
Recurrence	78 per 1000	15 per 1000	RR 0.21 (0.03 a 1.45)	⨁◯◯◯[1,2] Very low
	Difference: 63 patients less per 1000 (Margin of error: 76 less to 25 more)			

RR: Risk ratio.
Margin of error = 95% confidence interval (CI).
GRADE: evidence grades of the GRADE Working Group (see later in this article).

The risk **WITH OPEN SURGERY** is based on the risk in the control group of the trials. The risk **WITH LAPAROSCOPY** (and its margin of error) is calculated from relative effect (and its margin of error)

[1] All of the included studies were observational, and most of them retrospective.
[2] There are differences in the types of surgery performed, depending on the complexity of the cyst, location and size, determining selection bias, which might skew the results in favor of laparoscopy

About the certainty of the evidence (GRADE)*

⨁⨁⨁⨁
High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⨁⨁⨁◯
Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate

⨁⨁◯◯
Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⨁◯◯◯
Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

*This concept is also called 'quality of the evidence' or 'confidence in effect estimates'.
† Substantially different = a large enough difference that it might affect a decision.

Other considerations for decision-making

To whom this evidence does and does not apply

- This summary applies to patients > 10 years with hydatid cyst, excluding patients with inactive cysts (type V Gharbi or type CE5 WHO).
- Does not apply to patients with complicated hydatid cyst that require emergency surgery.

About the outcomes included in this summary

- The outcomes included are those considered critical for decision making by the authors of this summary. Hospital stay and postoperative pain were not included because there is wide consensus in the literature about the benefit of laparoscopy on these outcomes.

Balance between benefits and risks, and certainty of the evidence

- It is not possible to make an appropriate balance between risks and benefits because the certainty of the evidence is very low.
- If there was a clear reduction of morbidity and mortality the balance would surely favor the intervention. If the benefit was only on hospitalization or other outcomes the balance would not be so clear.

What would patients and their doctors think about this intervention

- It is highly likely that patients and their doctors would be inclined to minimally invasive surgery because it has proven to be a safe procedure for many conditions. It is particularly important to inform about the certainty of the evidence.

Resource considerations

- Since there is uncertainty about the benefits because the certainty of the evidence is very low, it is not possible to make an adequate cost/benefit balance.

Differences between this summary and other sources

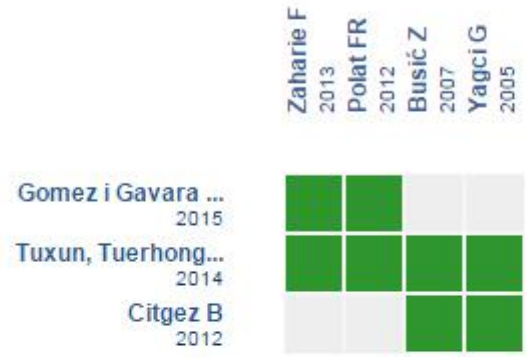
- The conclusion of this summary are consistent with those of the systematic reviews identified, that is laparoscopic approach is as or safer than conventional surgery, in terms of mortality and morbidity, but the certainty of the evidence is very low.
- No relevant clinical guidelines relevant for this question were identified.

Could this evidence change in the future?

- The likelihood that the information presented in this summary change with future evidence is very high due to the very low certainty of the evidence.
- There is at least one retrospective study [9] not included in the systematic reviews identified, which included 353 patients, with 60 participants receiving laparoscopic surgery and 293 conventional surgery. The study shows no difference in morbidity or mortality between the groups.

How we conducted this summary

Using automated and collaborative means, we compiled all the relevant evidence for the question of interest and we present it as a matrix of evidence.



Starting from any systematic review, Epistemonikos builds a matrix based on existing connections in the database.
The author of the matrix can select relevant information for a specific health question (typically in PICO format) in order to display the information set for the question.
The *rows* represent systematic reviews that share at least one primary study, and *columns* display the studies.
The boxes in green correspond to studies included in the respective reviews.

Follow the link to access the **interactive version:** Laparoscopic versus open surgery for liver cystic echinococcosis

Notes

The upper portion of the matrix of evidence will display a warning of "new evidence" if new systematic reviews are published after the publication of this summary. Even though the project considers the periodical update of these summaries, users are invited to comment in *Medwave* or to contact the authors through email if they find new evidence and the summary should be updated earlier. After creating an account in Epistemonikos, users will be able to save the matrixes and to receive automated notifications any time new evidence potentially relevant for the question appears. The details about the methods used to produce these summaries are described here http://dx.doi.org/10.5867/medwave.2014.06.5997.

Epistemonikos foundation is a non-for-profit organization aiming to bring information closer to health decision-makers with technology. Its main development is Epistemonikos database (www.epistemonikos.org).

These summaries follow a rigorous process of internal peer review.

Conflicts of interest
The authors do not have relevant interests to declare.

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