

Peer Review File

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Reviewer A

The study compares outcomes and costs between laparoscopic and robot-assisted cholecystectomy.

My first question is: what did you expect? Obviously, the outcomes of laparoscopic cholecystectomy can hardly be improved by the robot-assisted technique, as laparoscopic cholecystectomy is a standardized procedure with very low complications. Of course, a scientific comparison of both procedures is nevertheless justified and welcome.

The statistical tests used, as described in detail in the methods section, were adequately selected and performed.

However, in my view, there are some methodological shortcomings of the study:

- Why did you compare laparoscopic multiport cholecystectomy with robotic single-site cholecystectomy? Why didn't you choose the robotic multiport procedure for cost analysis – which would have made more sense in my opinion.

- Why was the following study not included in your analysis: (It is one of the most important comparative studies on the subject): The Early (2009-2017) Experience With Robot-assisted Cholecystectomy in New York State. Hoffman AB, Myneni AA, Towle-Miller LM, Karim SA, Train AT, Burstein M, Schwaitzberg SD, Noyes K. *Ann Surg.* 2021 Sep 1;274(3):e245-e252. doi: 10.1097/SLA.0000000000004932.

What new insights does the study provide regarding outcome and costs in addition to existing studies, e.g.:

- Huang 2017: <https://pubmed.ncbi.nlm.nih.gov/28011011/>
- Bedeir 2016: <https://pubmed.ncbi.nlm.nih.gov/25861905/>
- Han 2018: <https://pubmed.ncbi.nlm.nih.gov/29956028/>
- Gantschnigg 2023: <https://pubmed.ncbi.nlm.nih.gov/37552295/>
- Kane 2019: <https://pubmed.ncbi.nlm.nih.gov/31492434/>
- Ng 2023: <https://pubmed.ncbi.nlm.nih.gov/36959072/>
- Chen 2022: <https://pubmed.ncbi.nlm.nih.gov/35667278/>

How can the surgeon make a better decision now based on your results – as you stated in your introduction?

In my opinion, the study conducted does not generate any new or relevant data on the topic.

What would be needed would be a prospective randomized study, as it has already been proposed by many authors, but unfortunately not yet performed.

Authors reply

The authors want to thank you for taking the time to review our manuscript and helping us improve the quality of our manuscript.

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- 1) Thank you for the comment, and the authors agree that laparoscopic cholecystectomy is a standardized procedure with very low complications and with the advent of the robotic approach, a scientific comparison between the two approaches was deemed appropriate.
 - 2) The authors agree that it would have been better to compare laparoscopic

multiport cholecystectomy with robotic multiport cholecystectomy. Since the existing literature has compared the postoperative outcomes and the costs of the two methods separately, the authors wanted to reduce the burden on the reader and compare robotic cholecystectomy. We have acknowledged this limitation in our discussion.

- 3) Thank you for your comment and we agree that Hoffman et al, had published one of the most important and largest comparative studies on this topic but unfortunately, they did not meet the inclusion criteria for this systematic review. We have incorporated the findings of this study in our revised manuscript and discussion.
 - 4) Thank you for your comment this meta-analysis will help the readers to compare the cost and perioperative outcomes of robotic cholecystectomy with laparoscopic cholecystectomy in one paper, which can help in saving the precious time of surgeons and readers.
 - 5) Thank you for your comment this study can help the surgeon understand the use of a robot in cholecystectomy can be more costly when compared with conventional laparoscopic cholecystectomy and have comparable outcomes. Also, if a surgeon is accustomed to robotic cholecystectomy and the patient is having difficult anatomy due to pre-existing adhesions or comorbidity, they will be able to do better pre-operative planning.
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Reviewer B

Robotic surgery is more minimally invasive than laparoscopic surgery. There is less tissue

trauma and inflammation. However, the literature postulates efforts for surgical treatment centers to achieve this technology despite it's currently the gold standard for surgical pathologies treatment. The references need be more robust with impact journals in the literature.

The robotic cholecystectomy shows better precision to access difficult places, better ergonomics for the surgeon, more intuitive movements and three-dimensional vision.

Need to improve references, more robust articles with current results.

Authors reply

The authors want to thank you for taking the time to review our manuscript and helping us improve the quality of our manuscript.

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- 1) The authors agree with your comment and we have incorporated this in our revised manuscript in the introduction to improve the quality of our manuscript.
 - 2) Thank you for your comment and we have improved the references to improve the quality of our manuscript.
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Reviewer C

This is the first systematic review comparing the cost-effectiveness of laparoscopic cholecystectomy with that of robotic cholecystectomy.

In my opinion, this is a stimulating and instructive review that deserves to be published in TGH.

Anurag Singh et al, after a careful review of studies on the postoperative outcomes and cost-effectiveness of RC and LC, concluded that RC is associated with longer operative time and higher costs. The conclusion is virtually an exact mimic of what happens in real life.

Heterogeneity was well observed in this meta-analysis.

I have one concern that I would like to address: I have not been able to find a registration number on PROSPERO. According to the NHS, they should have registered the protocol on PROSPERO as a systematic review and meta-analysis before submitting it. Have they done that? If not, why?

As a small improvement, they should arrange the references in the introduction chronologically to give a more professional impression.

Otherwise, the meta-analysis is pure, foolproof and contains reasonable information that can be used in daily practice.

Authors reply

The authors want to thank you for taking the time to review our manuscript and helping us improve the quality of our manuscript.

- 1) Thank you for your encouraging comments, we have registered this manuscript on the research registry and the registration number is Reviewregistry1720.
 - 2) We have mentioned the references in a chronological manner as advised.
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