



Health

Robotic Surgery Review

**Colorectal Surgery
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Background

Robotic colorectal surgery has developed more slowly than robotic urological surgery, but we are currently in a period where there is a dramatic increase in the number of robotic colorectal centres in the UK.

Overview of operations and evidence

Many of the hopes of achieving widespread adoption of robotic colorectal surgery hinged on the ROLARR trial which was a randomised controlled trial (RCT) of laparoscopic versus robotic colorectal rectal surgery, comparing rates of conversion to open ([ROLARR Randomised Clinical Trial](#)). When published in 2017, this showed no significant difference in conversion rates (8.1% versus 12.2%); however, a subsequent follow-up paper showed that when adjusted for the robotic learning curve, there was a benefit of the robotic approach ([Exploring and adjusting for potential learning effects in ROLARR: a randomised controlled trial comparing robotic-assisted vs. standard laparoscopic surgery for rectal cancer resection](#)). In addition, the data showed there was a clear benefit in the narrow male pelvis.

Since then, there have been numerous systematic reviews that have collated data from a variety of trials that have shown clearer evidence of a benefit of the robotic approach.

For example, in terms of conversion to open, this paper, [Laparoscopic vs. robotic rectal cancer surgery and the effect on conversion rates: a meta-analysis of randomized controlled trials and propensity-score-matched studies](#), showed a clear reduction in the conversion rate of robotic colorectal surgery versus laparoscopic.

Similarly, a meta-analysis of outcomes has shown that the completeness of mesorectal excision is higher in robotic surgery compared with laparoscopic, which would suggest outcomes are also better: ([Completeness of total mesorectum excision of laparoscopic versus robotic surgery: a review with a meta-analysis](#)). Perhaps more dramatically, there is now some data from a smaller study to suggest improved longer term outcomes ([The impact of robotic total mesorectal excision on survival of patients with rectal cancer—a propensity matched analysis](#)).

Rectal cancer surgery

This is the field where the evidence is perhaps most clear cut. There is a technical benefit when the patient has a male type narrow pelvis and the systematic reviews and metanalysis are all heading in the direction of improved outcomes when comparing laparoscopic and robotic approaches.

Proposal

AXA Health should fund robotic rectal cancer surgery.

Right hemicolectomy

This is a commonly performed laparoscopic procedure, and it is thought there could be two advantages to a robotic approach. One is the ability to perform an intracorporeal (inside the patient) anastomosis, meaning the incisions are much smaller and placed lower, resulting in decreased pain and improved cosmesis. The second advantage is that robotic approaches can enable a more radical

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operation to be performed, e.g. complete mesocolic excision of right colon. This involves taking more lymph nodes and is becoming standard of care in Europe.

Proposal

AXA Health should fund robotic right hemicolectomy if the plan is either to perform a complete mesocolic excision of right colon, or that there will be an intracorporeal anastomosis.

Left hemicolectomy / sigmoid colectomy

For these operations the benefits were less clear cut, with hard evidence of improved outcomes absent. One advantage was that the splenic flexure might be easier to get down properly, meaning the join is safer.

Proposal

AXA Health should ask for justification of why these cases are benefiting from a robotic approach.

Benign surgery

Benign surgery, again, is an area where robotic benefits are far more variable. All surgeons could describe cases where the robot allowed a minimally invasive approach, where otherwise it would be done open, but these were frequently hostile abdomens due to multiple prior surgeries, Crohns disease, etc.

Proposal

AXA Health should ask for justification of why these cases are benefiting from a robotic approach.

Summary / proposal

The following procedures have reasonably robust evidence to support improved outcomes when done robotically and therefore should be funded:

- 1) Rectal cancer surgery.
- 2) Complete mesocolic excision of right colon.
- 3) Right hemicolectomy with intracorporeal anastomosis.

The following procedures may be better approached robotically, but justification of the approach should be sought:

- 1) All other colonic cancers.
- 2) Benign colorectal surgery.