



Robot-assisted surgery for patients with rectal cancer

What is rectal cancer?

Rectal cancer is a form of bowel cancer where the tumour develops in a part of the large intestine called the rectum.

What is robot-assisted surgery?

The main treatment option for patients with rectal cancer is surgery to remove the tumour and other affected tissues. Currently surgeons in Scotland perform keyhole surgery or open surgery to remove rectal cancer.

An alternative operation for rectal cancer is robot-assisted surgery. In robot-assisted surgery the surgeon performs keyhole surgery using a robotic device with multiple arms which hold instruments needed for the operation. The surgeon operates the robotic arms from a console that shows magnified 3D views on a monitor.

What we did

We looked for an answer to the question:

What is the clinical effectiveness and value for money of robot-assisted surgery compared with keyhole surgery for the treatment of rectal cancer?

What we found

People who had robot-assisted surgery for rectal cancer were less likely to have their operation converted to open surgery compared with people having conventional keyhole surgery. People who have keyhole or robot-assisted surgery converted to open surgery can have poorer outcomes following their operation. The likelihood that an operation would be converted to open surgery was higher for men than for women and for obese patients compared with normal or underweight patients.

Patients undergoing robot-assisted or conventional keyhole surgery had similar risks of dying within 30 days of surgery, disease recurrence, length of hospital stay, number of complications from surgery and three-year post-surgery survival. A patient organisation submission from Bowel Cancer UK indicated that the impact of surgery on urinary incontinence and sexual function were important to patients. From the evidence we were unable to determine if robot-assisted surgery for rectal cancer resulted in fewer cases of urinary incontinence or sexual dysfunction compared with keyhole surgery.

A small number of equipment malfunctions were reported during conventional keyhole and robot-assisted surgery for rectal cancer. These malfunctions were not related to the robotic surgical device and mostly resulted in no or minimal harm to patients.

Each robot-assisted surgery for rectal cancer costs approximately £980 more than keyhole surgery for the same condition.

Surgeons will need training on how to use the robotic device before performing robot-assisted rectal cancer surgery. It was estimated that a surgeon will need to perform at least 39 rectal cancer surgeries using a robotic device before they are proficient at this procedure.

What is our advice to NHSScotland?

Robot-assisted surgery should be considered for patients with rectal cancer who have a narrow pelvis, are obese ($BMI \geq 30$), and/or have a tumour located in the mid-to-low rectum. Evidence suggests that these patients have a lower risk of their operation converting to open surgery if they have robot-assisted surgery. It is unclear if robot-assisted surgery provides good value for money.

Information on patient outcomes following robot-assisted surgery for rectal cancer should be collected for all patients who meet the above criteria and receive robot-assisted surgery in Scotland.

Provision of robot-assisted surgery for rectal cancer should be concentrated within hospitals that currently have a robotic surgical device and are likely to have a sufficient number of suitable patients per year to maintain surgeon proficiency.

Future work

Research is needed that looks at long-term outcomes for patients following robot-assisted surgery for rectal cancer. Studies are also needed that assess the value for money of robot-assisted surgery compared with conventional keyhole surgery in patients with rectal cancer.

This plain language summary has been produced based on SHTG Advice Statement 013-18, November 2018