



Letter to the Editor

Robotic surgery: Is the technological advance worth the bravado?



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Robotic assisted surgery is a rapidly expanding technology that has found a niche in multiple different surgical specialties worldwide. It now has approved uses in Urology, Gynaecology, Otolaryngology and General Surgery. Robotic assisted surgery links a minimally invasive approach with the additional benefit of a three-dimensional image.

In the United Kingdom, spending on robotic machinery has rapidly increased over the last decade. 2017 saw the highest number of tenders for robotics companies from the public sector, with up to 50 contracts published [1]. More than a quarter of UK hospitals which carry out surgery already use robots, a figure which will increase this year [1].

Patents are essential to encouraging innovation. Intuitive Surgical[®], the major player in robotic surgery, has dominated the market [2]. Many of its patents expired in 2016 [2], clearing the way for further progressive technology to change the landscape in robotic surgery.

The claimed benefits of robotic assisted surgery are well documented and include smaller incisions, decreased blood loss, shorter hospital stays, a faster return to work, improved cosmesis, and a lower incidence of some surgical complications. While one can appreciate these advantages, the majority of these benefits are short term and limited to the acute perioperative period.

Documented risks of robotic surgery are similar to that of open and laparoscopic surgery. Additional unique risks with robotic surgery include human as well as mechanical systems errors, as well as extreme positioning - this introduces further risks of nerve palsies secondary to direct nerve compression.

Apart from its obvious advantage in accessing areas of the body better than conventional laparoscopic instruments, the robot has limited advantages in gastrointestinal surgery in the real world. When laparoscopy was introduced in late 1980s, its advantages over open surgery in terms of reduced post-operative pain, cosmesis, and early recovery were significant. Recent studies comparing Laparoscopic gastrointestinal surgery with Robotic assisted gastrointestinal surgery does not confer a significant advantage in relation to conversion rates, complication rates or quality of life studies [3].

Non-robotic procedures when performed at regions with lower robotic volume and by surgeons with less experience take significantly more time. Furthermore, overall it is more expensive than open surgery given the initial capital and ongoing maintenance costs [4].

A recent large phase III randomised controlled trial conducted in the USA compared outcomes in 350 patients who underwent open vs

robotic assisted cystectomy [5]. Conclusions from the trial demonstrated both techniques are equally effective with no difference in complication rates and two-year progression free survival. The authors further commented that there is a steep cost and learning curve which must be built on and assessed when making rational patient-based decisions [5].

The advantages and limitations of robotic surgery are obvious even without any validated trials. The main question is whether such expensive technology is useful for “general” surgery or whether its use should only be limited to inaccessible areas. The specialisation should be limited into the hands of a select few. Unfortunately, the bullet has already left the gun. This complex technological marvel adds to the already struggling budget for healthcare and ever-expanding waiting lists due to long learning curves of training junior doctors. The surgical profession needs to evaluate these issues rather than being driven by the industry – however innovative it may seem.

Although there are recognised benefits with regards to robotic assisted surgery, there is little evidence demonstrating that robotic surgery provides any long-term benefits over open or laparoscopic techniques. Further data and studies such as the large randomised controlled trial mentioned would aid our understanding in the subject. Surgical outcomes are ultimately a direct manifestation of the skill and experience of the surgeon, not the technology or approach used.

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