Dear Editor,

Robotic surgery to treat colorectal cancer was first used in our regional university at the end of 2014. Staff undertook a comprehensive training program to acquire new techniques required for using this innovative device, composed of online training, onsite training at our institute with the actual robot, off-site training using animal subjects, visiting institutes with the relevant expertise, and pre-operative simulation. By the end of 2016, seven cases had been treated using robotic surgery at our institute. Although the mean operation time (range: 179-464 minutes) is longer than that for laparoscopic surgery in our institute, there have been no cases of open conversion or postoperative complications following robotic surgery. Hence, the use of robotic surgery to treat colorectal cancer in our institute seems feasible so far. However, furtherance of robotic surgery requires solid evidence of this technique’s real benefits.

Schootman et al recently compared the short-term results of robotic surgery and conventional laparoscopic surgery for treating colon diseases\(^1\). Data for a total of 2233 robotic and 10,844 conventional laparoscopic surgeries performed between 2013 and 2015 were obtained from the National Surgical Quality Improvement Program (NSQIP). Not surprisingly, the propensity score-matched outcomes revealed that robotic surgery was associated with longer operation time and a lower chance of open conversion. It is likely that the setup for robotic surgery (including docking and undocking) to enable console operation contributed to the extended operation times. In addition, the consequent dexterous surgery theoretically reduced open conversion rates. However, in contrast to general expectations, analysis of postoperative complications revealed that some complications were 3.1% more frequent following robotic surgery. Increases in critical events such as readmission within 30 days of surgery, prolonged ileus, reoperations, and anastomotic leakage are concerning.

Many reviews have also discussed the safety and efficacy of robotic surgery in patients with rectal colorectal cancers\(^2,3\). Robotic surgery was consistently associated with decreased open conversion rates and longer operation times; however, most of the studies analyzed were retrospective studies. Although it appears that robotic surgery and conventional laparoscopic surgery have similar safety profiles, this alone is not enough to justify the preferential use of robotic surgery, especially considering the higher costs associated with this technique. Some reports indicate that robotic surgery is a superior technique for patients with rectal cancer. A recent study found that patients had better urogenital function due to preservation of the pelvic nerves following robotic surgery\(^4\). Postoperative complications in patients with obesity or lower rectal cancer treated at a single institute were also consistently reduced following robotic surgery\(^5\).

Overall, the literature suggests that robotic surgery adversely affects the outcomes of colon surgery but has a favorable impact on rectal cancer outcomes. This poses the question: why doesn’t robotic surgery benefit colon surgery? We should also emphasize that Schootman et al\(^1\) presented data from multiple institutes and that profiles of the surgeons involved were not available. In contrast, the latter studies were conducted at single institutes where the surgeons have extensive experience. Difficult cases are more likely to be treated by experts, and more
challenging cases are apt to be referred to centralized hospitals. We are deeply concerned that the statistical analysis conducted by Schootman et al \(^1\) on 13,077 patients did not take into consideration surgical expertise or other indicators of surgical quality. Therefore, the results might have hidden the real benefits of robotic surgery.

Korst and Less \(^6\) debated whether a clinical trial is necessary to compare robotic surgery and conventional laparoscopic surgery. They provided five compelling reasons against clinical trials, emphasizing that clinical trial results would not stop the trend towards robotic surgery. Indeed, a large-scale clinical trial recently conducted in Japan didn’t statistically prove non-inferiority of laparoscopic colectomy compared to open surgery, yet widespread spread of laparoscopic surgery did not change \(^7\), although surgeons have to go back to the era of open surgery according to the trial result. However, we still consider that a well-designed, randomized controlled trial is required. This is especially important in light of Criss and Gadepalli’s investigations into the relationship between sponsorship and study conclusions that highlighted the potential negative influences of commercialization on academia \(^8\). Their discussion, which provided an example of a worldwide recall of a medical device, highlighted the disastrous consequences of this phenomenon.

Even if robotic surgery really causes only one additional complication in 32 surgically treated patients \(^1\), this is enough to impel strict guidelines for utilizing this procedure. If robotic surgery can be performed with a safety profile that is equivalent and/or superior to conventional laparoscopic surgery, then the surgical approach chosen should be based on the preferences of both surgeon and patient.

References