Editorial

Robotic adrenalectomy: the jury is still out

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Abstract: A minimally-invasive approach is the gold standard for surgical management of the majority of adrenal masses. While laparoscopy has traditionally been used, robotic adrenalectomy is becoming increasingly utilized. This article discusses a recent systematic review and meta-analysis from *European Urology* that analyzed evidence comparing laparoscopic and robotic adrenalectomy. Robotic adrenalectomy is associated with lower blood loss, length of stay and fewer complications compared to laparoscopic adrenalectomy; however information on efficacy and cost are not addressed. Ultimately, well-done randomized controlled trials (RCTs) are necessary to determine the benefits and cost of robotics in adrenal surgery.

Keywords: Adrenalectomy; laparoscopy; robotics

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Minimally-invasive adrenalectomy is the gold standard treatment for the surgical management of the majority of adrenal masses. Compared to open surgery, laparoscopic adrenalectomy is associated with less blood loss, less ileus, decreased pain, faster convalescence and shorter hospital length of stay (1,2). Robotic adrenalectomy is an alternative minimally-invasive platform for adrenal surgery that may provide greater range of motion, improved magnification and stereoscopic vision compared to traditional laparoscopy (3). However, relatively few studies have compared the two approaches.

Recently, Brandao and colleagues performed a systematic review and meta-analysis of studies comparing laparoscopic and robotic adrenalectomy (4). Overall, nine studies including 600 patients (277 robotic and 323 laparoscopic) were included in the analysis. Of the nine studies, eight were observational, retrospective studies (5-12) and one was a randomized controlled trial (RCT) (13). The quality of studies varied with the observational studies ranging from 6-7 out of 9 on the Newcastle-Ottawa Scale (14) while the RCT was only 2 out of 5 on the Jadad scale (15).

The authors found that significant differences in hospital length of stay (P<0.00001), estimated blood loss (P=0.001) and complication rate (P=0.05) favoring robotic over laparoscopic adrenalectomy. However conversion rate (P=0.61) and operative time (P=0.33) were similar between approaches.

Overall the authors should be commended for their work in synthesizing and analyzing the evidence for robotic adrenalectomy. Any new surgical technique must be equally efficacious and safe as the gold standard operation while also bringing something new to the table. In this report, it appears that robotic adrenalectomy does have a similar safety profile; however, a meta-analysis is only as strong as its component studies. Unfortunately, the component studies do not address efficacy in terms of positive margins or normalization of serum markers for metabolically active tumors. More importantly, data on cost is not included, and even with lower length of stay, there is likely a cost premium associated with robotics over traditional laparoscopy for an extirpative procedure, as is the case in radical nephrectomy (16).

Ultimately, what this meta-analysis highlights is the need for more well-done RCTs for adrenal pathology. Questions regarding the role of robotics compared to pure laparoscopy both overall and in specific groups such as patients with pheochromocytoma, large tumors, or in patients who are candidates for partial adrenalectomy remain unanswered. Additionally, the role of minimally-invasive surgery in the treatment of adrenal cortical carcinoma is still unclear.

While laparoscopic adrenalectomy remains the gold standard, investigators who pursue robotic adrenalectomy should proceed with the above questions in mind.

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Footnote

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