Editorial
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Robotic surgery an evolution of future direction

Demands of surgeons and patients have been going hand in hand with minimally invasive surgery. Its known benefits of having less postoperative pain, shorter hospital stay, better cosmesis and reduced morbidity while offering equivalent therapeutic results were considered of interest. Besides modification in laparoscopy, robotic system has also been extensively described in the literature showing that it improves surgical outcomes owing to its inherent advantages. The cost that entails in obtaining robot along with consumables and maintenance are always part of the hurdle against the advantages it offers. Further introduction of new robotic platforms may offer reduction in costs, training, and acquisition of robot in different parts of the world. With the recent technologies at hand, surgical learning, steps, and procedures have been redefined in order to achieve better results. Over the years, enhancement of treatment armamentarium for our patients has been our goal. This only shows how far we have gotten in terms of further enhancing our surgical options. Our goal here is to provide evidence based advancements in robotic surgery technique aimed towards a standardized procedure.

Adoption of minimally invasive surgery has been widely embraced by urologist in their field of subspecialty. The first review, "Past, present, and future of laparoscopic renal surgery" by Cwach and Kavoussi [1] provides insight on how technological advancements have brought rapid evolution on our surgical care especially in the field of minimally invasive surgery. It has continuously proven to have better perioperative outcome than open technique. Having equivalent oncologic outcome and superior functional results have pushed urologists towards laparoscopic renal surgery. Aside from natural orifice transluminal endoscopic surgery and laparoendoscopic single-site surgery, future evolution in robotic technology might further decrease the learning curve and enhance its application in renal surgery. Authors have presented that after 30 years of application laparoscopic renal surgery, it has proven to be a safe technique. Further developments might also attenuate the intersurgeon variability of performance resulting into excellent outcome at a minimal cost.

Worldwide spread of robotic technology has made a great impact on the surgical training programs of aspiring urologists and even postgraduate urologists. Traditional teaching method of "see one, done, teach one" has been eradicated by availability of improved technology. Santok et al. [2] described proctoring as a process which entails observation by another to assess skill level one has acquired justifiable to commence robotic surgery. It serves as a mechanism to ensure patient safety in the initial phase of a surgeon's learning curve. Undeniably, uniformity and proper standardization of robotic surgery training is lacking but on its way to build strong foundation programs. Though fundamental curriculum is at its infancy and adaptation has a promising early result, proctorship incorporation on its course seems valuable based on the article. Moreover, they presented that future developments in technology have made proctorship more promising in attenuating the surgeons' learning curve while providing optimal care for our patients.

Since its introduction in early 2000's da Vinci surgical system (Intuitive Surgical, Sunnyvale, CA, USA) has flourished all throughout the world. Hinata and Fujisawa [3] reported a multi-institutional, prospective, nonrandomized clinical trial for safety and effectiveness of robot assisted partial nephrectomy in Japan. This trial paved way for the Japanese Ministry of Health, Labour and Welfare to render public insurance coverage for robot-assisted partial nephrectomy (RAPN). This change has allowed access of RAPN to everyone regardless of social status. As one might expect, this would spell more cases of RAPN. Its widespread use and its inherent minimally invasive advantages it would offer cure among patients with localized renal cancer at an acceptably low morbidity and better short-term functional outcome over conventional laparoscopy. This in effect would also reduce the number of patients progressing to chronic kidney disease and further lead to reduction in medical expenses.

In the article “Robotic assisted adrenalectomy: Is it ready for prime time?” by Teo and Lim [4], the authors revisited the current situation of adrenalectomy. Aside from the commonly performed surgeries with robotic aide, robotic assisted adrenalectomy has also been gaining popularity. Their review showed that between the two technique transperitoneal and retroperitoneal, the former has gained some edge due to larger working space. They also found out that the former has been preferred especially for tumors larger than 5 cm. In terms of learning curve, robotic assisted adrenalectomy requires only 10–20 while laparoscopic needs 20–40 cases. Their findings have provided a stable ground that robotic assisted adrenalectomy offers a shorter operative time, reduced blood loss and shorter hospital stay over laparoscopic approach in high volume centers. This has answered their question if it was ready for primetime.

While we tackle most of the robotic advances it is quite worth mentioning how preoperative imaging has been redefined. Primary and secondary staging of prostate cancer has been meddled by recent advancements in the field of radiological sciences. In the review done by Sathianathen et al. [5] they reported that functional imaging has the potential to transform what we have perceived about prostate cancer imaging. They have shown that positron-emission tomography linked with radiolabeled prostate-specific membrane antigen has shown promising results with superiority over conventional imaging especially in the setting of biochemical recurrence. Despite this advantage, its infancy use still awaits plausible results in primary staging studies. However, in totality these impressive results might be the direction of future trends in clinical staging.

As described by Li et al. [6], evidence of extended pelvic lymph node dissection has been studied over the past. Contradicting beliefs has been put between benefits and perioperative morbidity especially on patients with less likelihood of lymph node positivity. With rampant use of robotic surgery, results have shown that perioperative morbidity, lymph node yield of robotic extended pelvic lymph node dissection (ePLND) is equivalent to open technique. This contradicts the previous belief that PLND performed with robotic assistance often yields to understaging. They have also presented that ePLND may be of benefit over limited PLND (lPLND) owing to the irregular patterns of drainage. This disparity was better portrayed by a superior 5-year biochemical recurrence-free survival of ePLND over lPLND. Although it may be technically demanding, they have highlighted the prognostic and therapeutic advantage of robotic ePLND in well selected candidates.

According to Alnazari et al. [7] amidst all the advantages of robotic technology like 3-dimensional vision and endowrist capability, bladder neck dissection still remains one of the most difficult step during robot-assisted radical prostatectomy (RARP). Improper dissection can lead to catastrophic events like injury to ureteral orifice or even going into the prostate itself. In their article they recommended to incorporate 4 important steps: identification of prevesical transition, Foley jiggle test, tenting and pinching of the bladder neck using robotic instruments to conquer this hurdle during RARP. Likewise, proper anatomical identification coupled with these standardized steps will help in achieving optimal outcome. Additionally in patients who had previous transurethral prostate surgery, careful identification of posterior bladder neck is a must. These meticulous techniques will ensure safety and ease the learning curve of beginning robotic surgeons.

Various techniques have emerged together with the development of robotic technology in the recent years. As described by Tavukcu et al. [8] enhanced vision of robotic platform has been able to help surgeons identify key anatomic landmarks to gain better functional outcome during RARP. In their review, they mentioned that proper evaluation and execution like preoperative risk stratification, athermal dissection minimal traction and bilateral preservation has been linked to better potency outcomes. Although RARP has shown superiority over other techniques nerve sparing techniques, it is still affected by preoperative potency and cancer extent. While we hold this advantage, they reiterated that intraoperative anatomic variations can likewise be a factor in the degree and techniques (i.e., intrafascial and interfascial) of nerve sparing. They also found out that retrograde approach carries an advantage of early identification of neurovascular bundle which avoids misplaced clip and reduced neuropraxia resulting into early recovery of potency.

An inevitable paradigm shift might be at hand when these techniques and enhancements have become readily applied worldwide. This will help urologists in their quest to deliver optimal treatment outcome in the era of robotic platform.

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CONFLICTS OF INTEREST

The authors have nothing to disclose.

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