

## Prospects of Robotics in Urology: A New Era

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The Czech writer Karel Capek created the name 'robot' in 1921. It comes from the Czech word 'robota' in his play where Robots assisted their owners with many jobs [1]. The robotic surgical systems were developed from the initial da Vinci<sup>®</sup> system built up by Intuitive Surgical (Sun-nyvale, US). The da Vinci<sup>®</sup> robot was initially developed for cardiac surgery in 1999. Robotics were used in, radical cystectomy, radical prostatectomy, partial nephrectomy, nephrectomy, pyeloplasty, nephroureterectomy and in other areas. As for robotic radical cystectomy results, these are similar to open radical cystectomy oncologically and functionally [2]. Furthermore, Good oncological outcomes were reported in other series with a median follow-up of over 5 years [3]. Another study confirmed that robotic cystectomy was non-inferior to open cystectomy for 2-year progression-free survival [4].

Concerning robotic assisted prostatectomy, in a preliminary experience with extraperitoneal robotic assisted simple prostatectomy using the da Vinci, it was found that it is safe and efficient. It requires small cystostomy, and catheter was removed on the first post-operative day [5]. Older men undergoing Robotic-Assisted Radical Prostatectomy (RARP) for aggressive disease have comparable recovery to younger men. Advanced age should not be a contraindication for RARP in older men [6]. Return to complete continence improves after the first 12 months after RARP regardless the age group. Technically Retzius-sparing technique, as opposed to the conventional anterior approach, is associated with earlier continence recovery, and complication rates are similar in both groups [7]. Robot assisted radical prostatectomy had a shorter operation time, postoperative pelvic drainage time, postoperative length of stay than laparoscopic radical prostatectomy [8]. Simultaneous treatment of an inguinal hernia if present is a reasonable step during robotic prostatectomy [9].

About the uses of robotics in the kidney, robot-assisted laparoscopic partial nephrectomy with preoperative three-dimensional computed tomography may have advantages for

resection of tumors in patients with horseshoe kidneys [10]. In children, robotic assisted pyeloplasty is safe and effective with shorter operative time though robotic surgery had higher cost than laparoscopic pyeloplasty [11]. Robotic retroperitoneal partial nephrectomy has shorter operative times and less blood loss with equivalent oncologic and post-operative outcomes as compared to the transperitoneal route [12]. Total and partial nephrectomy of renal tumors in children may be used in selected cases provided oncological rules are abided [13]. On the other hand, robotic nephroureterectomy for upper tract urothelial carcinoma is feasible and safe in non-metastatic cases [14]. Comparing long-term outcomes of laparoscopic and robot-assisted laparoscopic partial nephrectomy, the later provides long-term (5-years) oncological and functional outcomes in selected patients [15]. In iatrogenic ureteral strictures, robot assisted redo surgery results in an excellent success rate equivalent to open surgery with minimal morbidity and is an alternative treatment for failed pyeloplasties [16]. As for urinary tract stones treatment, it is influenced by the economic impact. Robotic treatment does not have an additional benefit in index cases. The place of robotic surgery in renal tract calculi management is yet to be defined [17].

Lastly, in the era of electronic media like YouTube and other modes, websites may include high-quality videos of robot-assisted procedures, though there is no objective parameter to predict the educational quality of the videos [18].

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