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Editorial

The Da Vinci Surgical System

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The Da Vinci Surgical System is a robotic platform for minimally invasive surgery developed by Intuitive Surgical, offering enhanced precision and dexterity through instruments and high-definition 3D vision. The system consists of a surgeon console for control, a patient-side cart holding robotic arms, and a vision cart for processing images, enabling surgeons to perform complex procedures with a greater range of motion and reduced surgeon tremor. Benefits of Da Vinci surgery include smaller incisions, faster recovery times, and less pain, with applications in various fields like urology, gynecology, and cardiothoracic surgery. There is growing interest among patients and surgeons in minimally invasive techniques, primarily due to the introduction of the Da Vinci Surgical System in 2001 [1]. RAS (robot-assisted surgery) has become an important part of urologic surgery. Robot-Assisted Radical Nephrectomy (RAN) is likewise increasing, and the robot has also allowed non-experienced surgeons to perform robot-assisted pyeloplasty (RPyel) with excellent results. Other procedures also performed are partial nephrectomy and cystectomy. Continued development and improvement in curricula and assessment must persist, particularly as new technologies develop rapidly. Sophisticated features of newer robotic systems including objective performance indicators, augmented reality, virtual reality, artificial intelligence, and machine learning are gaining pace and are positioned to expand robotic surgery and robotic surgical simulation education even further over the next 25 years [2]. The da Vinci® robot was initially developed for cardiac surgery in 1999. Modern-day Robotic-Assisted Laparoscopic Surgery (RALS) is, mostly dominated by urological, gynaecological and visceral surgery. In the UK, the robotic systems have increasingly become the backbone in a number of urological units [3]. The particulars of evolution, utility, and future directions of the da Vinci SP® in pediatric urology, focusing on perioperative outcomes and intraoperative details, are studied.

Recent findings have shown that the single-port (SP) approach has been safely and successfully utilized in various pediatric urological procedures, including pyeloplasty, nephroureterectomy, and appendicovesicostomy. Reports indicate mixed operative times but similar hospital stays and postoperative outcomes compared to Multiport (MP) robotic surgery. The learning curve for transitioning from Multiport (MP) to Single Port (SP) systems in pediatric patients appears manageable, though the smaller abdominal circumference in children poses a notable challenge. In Summary, the SP serves as a complementary option, rather than a replacement, for MP robotic surgery in pediatric urology, offering potential advantages in specific scenarios. Cosmetic outcomes with the SP appear at least as favorable as MP surgery, but further research is needed. Future research should focus on patient-centered outcomes to optimize SP robotic surgery use in pediatric patients [4]. Newer is the Da Vinci SP (single-port) robotic surgical system directs 4 surgical arms through a single 2.5-cm canula. Surgical success was defined as resolution of symptoms and improvement in renography drainage [5] Further studies' findings suggest that pyeloplasty using the da Vinci SP system can be initiated by robotic surgeons who can overcome the learning curve. Long-term postoperative outcomes must be assessed to further verify the feasibility of robot-assisted laparoscopic single-port pyeloplasty in non infant pediatric patients [6]. Complications do occur. A learning curve exists when embarking on this surgery. Further investigations and comparative studies with open and standard multi-port robotic surgery are awaited [7]. Five years after its initial clinical applications, the use of the Vinci Single-Port Robot System (DVSP) has demonstrated feasibility and safety. Nevertheless, there is anticipation for further studies with larger sample sizes and extended follow-up periods to provide more comprehensive insights and data on the long-term outcomes, including the incidence of incisional hernia [8].

In my view, the procedure has been approved for use in urologic and other surgeries. Kidney auto transplant or bilateral ureteral strictures repair are likely to be in the future of the SP® Surgical System.

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