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Editorial- BJUI

Title: From Novick to the NHS: the evolution of minimally-invasive nephron-sparing surgery

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The publication by Veeratterapillay and colleagues of a UK multi-centre study in a community setting marks a watershed in the availability and quality of minimally invasive nephron sparing surgery for renal cancer [1]. Such a turning point was predicted almost 17 years ago by Novick when he wrote, “minimally invasive modalities of tumour resection or destruction should be reserved for highly select patients and awaits improvements in technology, standardization of technique and long-term outcomes data before they may be completely integrated options.”[2] It appears now that robotic surgery provides such a platform. The current study describes the outcomes of patients treated with robotic assisted partial nephrectomy at four centres in Northern England, and demonstrates very good outcomes within their first 250 cases.

The benefits of nephron sparing surgery have been well described. Indeed, excellent outcomes for partial nephrectomy were described over 20 years ago in carefully selected cases, with benefits including reduced incidence of renal insufficiency compared to radical nephrectomy, which until that time had been viewed as the gold-standard for patients with RCC [3]. The popularity of partial nephrectomy for small renal masses however, appeared to decline with the advent of laparoscopy. It became apparent that a minimally invasive approach to radical nephrectomy had the advantage of improved recovery, reduced blood loss with equal cancer control to open nephrectomy [4]. Notwithstanding absolute and relative indications for partial nephrectomy, given the choice between an open partial nephrectomy and a laparoscopic radical nephrectomy, the balance for patients with an elective indication for partial nephrectomy was tipped in favour of a minimally

invasive yet radical approach [5]. Techniques for laparoscopic partial nephrectomy were in their infancy, and even in the leading high volume centres outcomes, including WIT and PSM rate, failed to match up to those of open surgery [6].

Fast forward to 2017 with the increasing utilisation of robotic assisted urological surgery carrying the advantages of 3D vision, wristed movement and integrated real-time intra-operative imaging - especially beneficial for procedures such as partial nephrectomy where quick and accurate suturing are essential for a successful outcome. Veeratterapillay and colleagues present a series of 250 patients from centres in the UK, in which each performs less than 50 robotic partial nephrectomy procedures per year yet the authors present favourable outcomes overall, with a positive margin rate of 7.3%, major complications in 6% and trifecta in 68.4%. An impressive learning curve is seen with improving outcomes over the series such that in the final 50 cases a trifecta (WIT less than 25min, negative surgical margin and absence of complication) was achieved in 82% of cases, with a PSM rate of 2% despite increasing complex nephrometry scores, which compares favourably with larger series from internationally renowned centres [6].

So then, with the results of the present study, can we say that Novick's requirements have been met, and that minimally invasive nephron sparing surgery is now a 'completely integrated option'? Certainly, with the widespread adoption of robotic assisted surgery, high quality outcomes are within the grasp of centres other than elite, academic institutions. As techniques develop and experience grows, robotic surgery can be increasingly offered even for resection of more complex tumours [Figure 1].

In order to ensure that minimally invasive nephron sparing surgery is delivered to the highest standards, it will be necessary for providers to ensure both quality assurance and quality control in their processes. The learning curve needs to be minimised with structured teaching and mentoring, and the use of adjuncts such as intraoperative USS or fluorescence should be a routine part of care.

Centres offering this technique should be mindful of the well documented volume-outcome relationship that appears to be ubiquitous among complex surgical procedures. If centres are performing fewer than an optimum number of cases they may consider affiliating themselves with other such centres in networks and forming a joint clinical governance program as has been

described for robotic radical prostatectomy and which has shown demonstrable improvements in outcomes.

Finally, auditing and reporting of outcomes remains the cornerstone of quality assurance as demonstrated by the introduction of the BAUS complex surgery audit which is intended to drive standards of care forward. Publications such as Veeratterapillay et al greatly assist in documenting the progress of new techniques and emerging technologies. Increasingly, patients expect transparency from healthcare providers, and with the necessary support processes in place, such initiatives, and the data that they produce will help to further improve the delivery of complex surgery to patients from all areas of our practice.

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