

Interviews

EMJ is pleased to introduce two leaders in nephrology: Erdem Canda from Koç University, Istanbul, Türkiye, and Jonathan Barratt from the University of Leicester, UK. Canda shares cutting-edge advances in robotic surgery for nephrology, while Barratt provides expert insights into developments in the field of IgA nephropathy.

Featuring: Erdem Canda and Jonathan Barratt



Erdem Canda

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Q1 Your work has been at the forefront of robotic surgery. How have advances in robotics changed outcomes for patients undergoing kidney procedures over the last decade?

Robotic surgery has been increasingly applied to kidney tumours for more than 20 years. During this period, surgical techniques have changed in parallel to the advancements in the surgical robotic systems used.

Examples might include:

- Thinner and more ergonomic robotic arms with smaller instruments, used with a

better technology, leading to microdissection with selective vascular clamping and zero ischaemia.

- Better 3D vision due to higher-quality lenses, and the ability to use indo-cyanine green (ICG) with fluorescence imaging to identify perfusion of the mass and kidney.
- The ability to use endoscopic ultrasound to identify the location of particularly endophytic masses.
- The ability to use virtual reality (VR) images as a guide during robotic surgery.
- In addition to multiport surgical robotic technology, we now also have single port systems that have their own advantages.

“**With the technologic advantages of the surgical robotic systems, we can better preserve normal kidney tissue**”

In summary, these recently developed and still developing technologies have increased the quality and efficiency of the robotic surgical technology used, leading to better identification of kidney tumour location, better excision of the tumour with clear

surgical margins, less injury to the normal kidney tissue, and less ischaemia of the normal kidney, ultimately leading to better surgical and oncologic outcomes.

Q2 How do robotic techniques compare with conventional surgery in terms of recovery, renal preservation, and long-term outcomes?

Conventional open surgery is rarely applied nowadays because robotic surgery is increasingly being used due to the advantages of being minimally invasive, decreased complications, and decreased bleeding and need for blood transfusions. These factors also lead to less pain, and thus fewer painkillers, faster recovery, shorter duration of hospital stay, and better cosmetic results.

The cost seems to be a disadvantage; however, when these advantages are taken into account, overall cost is much less than expected. In addition, we now have many robotic systems from different countries available, each with similarities and superiorities to each other, with commercially cheaper models because of the competition.

With the technologic advantages of the surgical robotic systems, we can better preserve normal kidney tissue and better remove the kidney tumour with less damage, less ischaemia, and better oncologic outcomes (i.e., with selective clamping, using endoscopic ultrasound and ergonomic smaller robotic instruments with a better 3D vision) for the long term.

“With this multidisciplinary approach, we can offer better diagnosis, treatment, follow-up, and preventive measures”

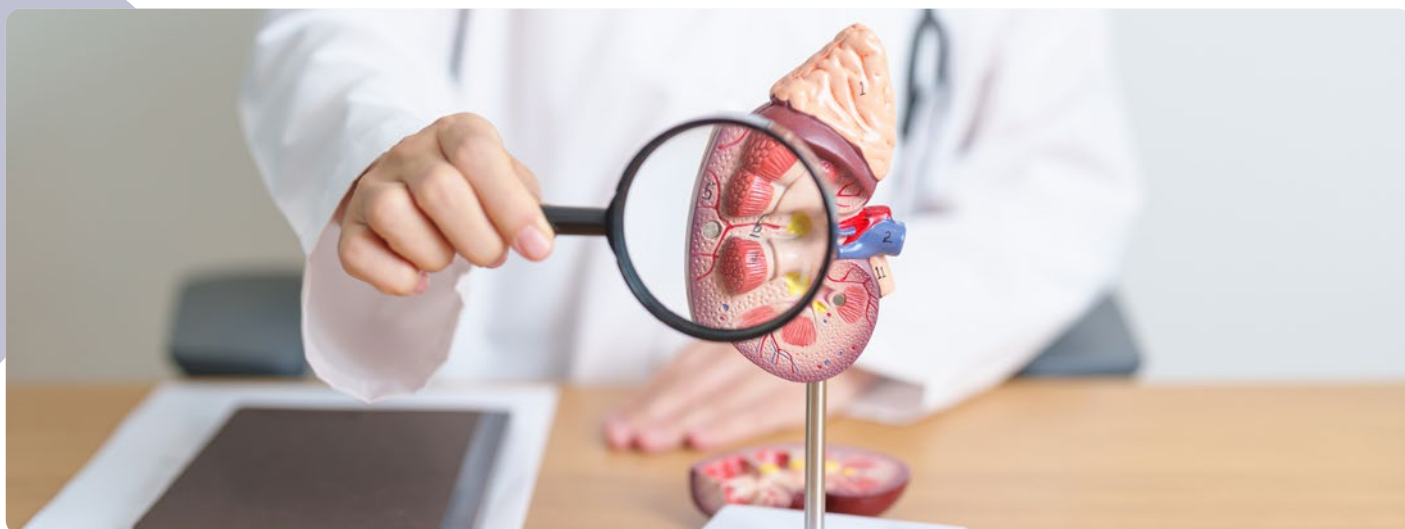
Q3 Partial nephrectomy has become a key strategy for preserving kidney function in patients with renal tumours. How has robotic surgery improved the precision of nephron-sparing procedures?

As the robotic systems that we have been using over the 20-year period have significantly improved

and will definitely be better in the future, this gives the surgeon the opportunity to better see, identify, and remove the kidney tumour with clear surgical margins, leading to better oncologic, surgical, and functional outcomes. Nowadays, kidney tumours are identified with a smaller size due to the advancements of radiological imaging and regular check-up programmes, leading to removal of the tumour rather than the kidney.

Q4 What role do you think multidisciplinary collaboration between nephrologists, urologists, oncologists, and surgeons plays in optimising outcomes for patients?

Dealing with kidney tumours is a team effort between urologists, nephrologists, oncologists, pathologists, radiologists, nuclear medicine physicians, and even genetic physicians. Therefore, with this multidisciplinary approach, we can offer better diagnosis, treatment, follow-up, and preventive measures. Collaboration with a nephrologist is important, as a kidney that has had a surgical injury (i.e., due to robotic partial excision of the tumour) will require postoperative follow-up by the nephrologist following surgical healing, and



patients with a solitary kidney who underwent kidney tumour excision are particularly important. As patients with kidney tumours are generally over 50 years old, an important part of this population has co-existing hypertension, cardiovascular disease, and diabetes, which all have a negative impact on kidney function.

Q5 AI is rapidly entering surgical practice. Where do you see AI having the greatest impact in robotic renal surgery over the next 5–10 years?

As in all fields, AI is increasingly being used and applied in urology. I think AI could play an important role in surgical planning by evaluating patient data from pre-operative imaging with patient characteristics, combined with the experience of the surgeon, which might suggest the type of robotic surgical approach needed, i.e., transperitoneal versus retroperitoneal; the type of surgical robotic system used, i.e., multiport versus single port; and the type of robotic instruments used, i.e., using endoscopic ultrasound, ICG, or VR tumour navigation, to achieve better outcomes.

Q6 Do you believe remote robotic surgery could eventually improve access to specialist renal procedures globally?

Telesurgery and telementoring are increasing being tested and used, with particular success in the last 2–3 years due to the increased availability of 5G technology, which enables negligible transmission delays (less than 0.035 seconds) that the human eye cannot identify. Transcontinental telesurgeries were even performed successfully with an over 12,000 km distance between the surgeon

and the patient. Therefore, I think that this will be the future of robotic surgery, not only in urology, but in almost all robotic surgical specialties. With this technology, an experienced robotic surgeon can help a colleague who is located on the other side of the world and who is less experienced to successfully and safely complete a kidney tumour removal procedure, and both the patient and the surgeon would benefit at the end. However, governments need to establish global guidelines by collaborating with medical specialties to use this technology safely and efficiently, taking into account medico-legal and ethical precautions.

“**Telesurgery and telementoring are increasing being tested and used, with particular success in the last 2–3 years due to the increased availability of 5G technology**”

Q7 In your experience, what are the most important factors when balancing oncological control with preservation of kidney function?

In surgical oncology, our aim is to completely remove the malignant tumour and preserve as much healthy tissue as we can while causing the least amount of harm to patients. With robotic surgery, we can achieve all of these targets. We can perform a minimally invasive robotic approach by using 8 mm-sized

robotic instruments that will lead to less patient injury and by using magnified 3D vision with ICG application; using endoscopic ultrasound to identify the borders and location of the tumour in the kidney; and applying selective clamping and using VR tumour navigation, with which we can completely remove the tumour and preserve normal kidney tissue with less injury. In addition, we can send this removed tumour to intraoperative pathological evaluation to make sure that it was removed completely.

In summary, we currently have all the technology that we require to achieve our goal of completely removing a kidney tumour with maximum preservation of the remaining kidney function, and I love using these technologies.

Q8 What advice would you give to young clinicians interested in pursuing robotic surgery and innovation in kidney care?

The future generation will definitely be better than us, and we will give our full support to train them. I think they will help us a lot in using, for instance, AI technology, to improve our daily robotic surgery practice. This will be a collaboration between generations that will lead to better patient outcomes. I would suggest that young urologists who are interested in robotic surgery should collaborate with experienced robotic urologists, as well as engineers and biomedical engineers, who will speed up their adaptation to the surgical techniques that we currently apply in robotic kidney surgery and also help them create new ideas for the future, particularly in using AI.