



## An Expeditious and Sustainable Multi-Specialty Surgical Approach in Starting a National Kidney Transplant Program

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### Short Communication

Kidney transplantation is the best treatment for patients with End Stage Kidney Disease. However, many patients in small and developing countries are deprived of this life-saving treatment because of the lack of surgical expertise. Traditionally, transplant surgeons come from different surgical backgrounds; particularly general surgery, vascular surgery and urology. Advanced specialty training in kidney transplantation usually requires training through the general surgery approach, with specific exit specialization in transplantation. Transplantation competencies and prerequisite core skills amongst surgical trainees usually include experience in providing access for renal dialysis, retrieving abdominal organs for transplantation and assessing patients for transplantation suitability [1]. However, the intensity of transplant on-call commitments and workload have deterred many trainees to take on training full-time, but instead to practice transplant surgery in parallel to a second specialty [2]. Variability in structured curriculum and the lack of interest from surgical trainees have led to transplant surgery being practiced by experienced surgeons from diverse backgrounds to obtain ad hoc and unstructured learning experience through an experiential approach. In addition, the complex transplant landscape in many parts of the world- transplant commercialization, underdeveloped framework for donation, culturo-religious barriers and health financing system- is not conducive to structured, high-volume and high-quality training.

Brunei Darussalam has a fledgling transplant program that was inaugurated in 2013 to serve a small national population of 400,000 [3]. From the outset, the small population meant that it was unfeasible to start a structured training program nor provide adequate numbers for trainees to learn transplantation skills. With a prevalent end-stage kidney disease population of 881 patients at the end of 2020, the country is unlikely to provide adequate number of eligible transplant candidates to secure and retain the service of a full-time transplant surgeon. Small countries with poor medical infrastructure also have to contend with the 'brain drain' phenomenon with suitable foreign-trained doctors seeking work opportunities overseas in bigger and more lucrative establishments [4]. Most often, smaller countries have to piggyback on established transplant services in other countries due to the lack of viability and sustainability in setting up programs [5].

The lack of local transplant surgical expertise meant that the country has to acquire foreign expertise from overseas transplant centers from Malaysia and Australia; to provide hands-on training with carefully selected local patients [3]. A local team of senior consultant surgeons-comprising of general surgeon, vascular surgeon and urologist- was assembled to accrue experience through working with the overseas team. The transplant surgery was fragmented into distinct parts to cater for the existing expertise of the local surgeons- urologist harvesting the donor kidney and doing the ureteric anastomosis, the vascular surgeon performing the vascular anastomosis and the general surgeon preparing the transplant vascular bed. The seniority of the local surgeons meant that the specific skills could be learnt quickly, in a shorter duration of

time, with less exposure than a newly-trained surgeon learning an unfragmented transplant operation. Furthermore, less time was required to hone these skills as they were already doing similar work in their day-to-day practice. Wolff et al [6], in a study with 1496 patients on surgical complications after kidney transplantation, concluded that carefully selected vascular and general surgeons could achieve good results in kidney transplantation after a relatively short period of training. Even surgeons with an experience of less than 10 kidney transplants did not have higher complication rates [6]. A similar study, with 184 cadaveric kidney transplantations, showed that surgical complications and outcomes were not significantly related to experience [7]. Another study involving less experienced urology-trained transplant surgeons showed that short- and long- term transplant outcomes were acceptable [8].

Since the start of the program, the country has attained local self-sufficiency in performing kidney transplantations, with 16 operations in 6 years. The surgeons also had experience in interchangeable roles and performing different stages of the surgery, in a smooth continuous fashion in 2 separate operating theatres, under a co-supervision model, where the more experienced specialty surgeon provides supervisory oversight to the other surgeons in the different stages of the surgery. The donor retrieval team starting 30-60 minutes ahead of the recipient team, with very short warm and cold ischemic time, through this conceptualized surgical framework, we have also been able to train a plastic surgeon who performs arterio-venous fistula for ESKD patients to participate in the vascular anastomosis segment of the surgery. To date, there was no serious surgical complications, with only two cases needing repeat laparotomy for bleeding and abscess collection [3].

In conclusion, our 'deconstructed' multi-surgical approach has allowed the emergence of skilled local transplant surgeons in an expeditious and sustainable fashion, through initial supervision and mentorship by foreign expertise, and later through a self-governance and co-supervision model. Importance of specialization and division of surgical labor has been eloquently described by philosopher Immanuel Kant: 'All crafts and arts have gained by division of labour, in which no one does everything, but each one is confined to certain works in order to do so more perfect and to do it with greater ease. Where the

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works are not so distinguished and distributed, where everyone is a jack of all trades, the trades are still in the greatest barbarism'[9]. Whilst understanding the rationale to safeguard quality through quantity, the delicate balance between minimum volume standards must be weighed up against the detriments of having no sustainable access to a community-benefiting local transplant program. For small countries that are looking to set up their own renal transplant program, a similar program like ours will be ideally suited for their adaptation.

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