

## A child weighing 8.5 kg with bilateral congenital dysplastic kidneys and end stage renal failure who has undergone a successful renal transplant

\*Randula Ranawaka<sup>1</sup>, V Pinto<sup>2</sup>, M D Lamawansa<sup>3</sup>, T Pathmanadan<sup>4</sup>, M P Gamage<sup>5</sup>, Asiri Abeyagunewardena<sup>6</sup>

*Sri Lanka Journal of Child Health*, 2017; **46**(4): 379-380

DOI: <http://dx.doi.org/10.4038/sljch.v46i4.8390>

(Key words: Child weighing 8.5 kg, renal transplantation, dialysis)

### Introduction

Infants are considered difficult candidates for transplantation due to a multitude of factors. Hence, many renal transplant units delay renal transplantation until the child reaches a reasonable size (10 kg)<sup>1</sup> and keep the child on dialysis until then. However, in Sri Lanka, due to lack of paediatric dialysis facilities, we are compelled to transplant children early. According to our knowledge this is the smallest child to undergo a successful renal transplant in the South Asian Region.

### Case report

A one year and nine month old boy presented with severe pallor, acidotic breathing and oliguria. On admission, the serum creatinine was 467 $\mu$ mol/L and the ultrasound scan revealed small echogenic kidneys. Peritoneal dialysis was commenced with an acute peritoneal dialysis catheter. This needed to be changed 4 times during the subsequent two months while preparing for transplantation and investigating the prospective donor.

<sup>1</sup>Consultant Paediatric Nephrologist, Department of Paediatrics, Faculty of Medicine, University of Colombo, <sup>2</sup>Consultant Anaesthetist, Department of Anaesthesiology, Faculty of Medicine, University of Peradeniya, <sup>3</sup>Professor in Surgery, Department of Surgery, Faculty of Medicine, University of Peradeniya, <sup>4</sup>Medical Officer, University Paediatric Unit, Teaching Hospital Peradeniya, <sup>5</sup>Medical Officer, Lady Ridgeway Hospital for Children, Colombo, <sup>6</sup>Professor in Paediatrics, Department of Paediatrics, Faculty of Medicine, University of Peradeniya


\*Corresponding Author: rrandula@yahoo.com

(Received on 23 August 2016: Accepted after revision on 23 September 2016)

The authors declare that there are no conflicts of interest

Personal funding was used for the project.

Open Access Article published under the Creative

Commons Attribution CC-BY  License

The transplant surgery was a challenge due to the small size of the child. The lower end of the aorta and the inferior vena cava were the vessels to which renal artery and vein were anastomosed respectively. Basiliximab was included into his immunosuppressant therapy as his panel reactive antibodies were positive. With meticulous fluid management, the central venous pressure during surgery and afterwards was maintained around 12-15 cm water. Transplanted kidney started to produce urine two hours after implanting, with the support of intravenous frusemide.

His immediate post-transplant period was complicated with a right sided segmental lung collapse and left sided pneumothorax leading to respiratory acidosis. He was extubated 48 hours post transplantation. Subsequently child made a rapid recovery and was discharged 2 weeks after surgery. His serum creatinine on discharge was 45 $\mu$ mol/L.

### Discussion

Renal transplantation (RTx) is an accepted mode of therapy in infants with severe renal failure. Infants form a minor group in paediatric RTx programmes. Incidence of children needing renal replacement therapy before 2 years of age is low (7-8 per million age-related population)<sup>2</sup>. The major indications are structural abnormalities of the urinary tract, congenital nephrotic syndrome, polycystic disease, and neonatal kidney injury<sup>3</sup>. In our case, child had the congenital dysplasia/hypoplasia of the kidneys.

Active treatment of infants before RTx is important to ensure optimal growth and development and to avoid complications that could lead to permanent neurological defects. Nutritional therapy, adequate calcium and vitamin D supplementation, phosphate binding medication, correction of anaemia, as well as management of hypertension and proteinuria are required to prevent the progression of renal failure.

Peritoneal dialysis (PD) is mostly used for end stage renal failure management before RTx<sup>4</sup> and

haemodialysis (HD) is reserved for those with problems in PD. In our case the only option was to start with PD as haemodialysis facilities for infants were not established at that time in Sri Lanka. Therefore, the only option available in a less favourable environment is to arrange early renal transplantation. Even though many renal transplant units delay renal transplantation until the child reaches a reasonable size (10 kg), infants who are at least 6 months of age and weigh 6 kg can be transplanted successfully with adult kidneys<sup>5</sup>.

Children on PD have even more capacious abdomens; in this situation adult kidneys have been transplanted into children weighing as little as 5.4 kg<sup>6</sup>. Earlier reports of renal transplants in infants were discouraging. The most common cause of early graft failure in young recipients is graft thrombosis. In the original reports on infant RTx, frequencies up to 30% were reported, but recently the incidence of thrombosis has been 2–10% in infants<sup>7</sup>. It is desirable to maintain a central venous pressure above 10 cm water prior to unclamping and the mean arterial pressure at more than 60 mm Hg<sup>7,8</sup>. After the operation, attention to the intravascular volume and electrolyte and acid–base stability is essential to ensure good renal function. Additional fluid infusions may be given if urine output drops. Systolic blood pressure values of 100–120 mm Hg are, however, allowed in this early phase.

The overall outcome of infant RTx has dramatically improved such that several registry data and single-centre reports show 10-year patient and graft survivals of over 90% and 80%, respectively<sup>8</sup>. The infant's age per se should not play a significant part in the transplantation decision-making process. This case demonstrates that renal transplantation in very small children is feasible and should be considered when indicated even in a resource poor setup since they are remarkably robust in their capacity for healing and growth. We believe the best chance an infant with end stage renal disease has for achieving normal development and a normal lifestyle is a successful transplant.

## References

1. Rizzoni G, Malekzadeh MH, Pennisi AJ, et al. Renal transplantation in children less than 5 years of age. *Archives of Disease in Childhood* 1980; **55**: 532-6.  
<https://doi.org/10.1136/adc.55.7.532>  
PMid: 7002060 PMCID: PMC1626782
2. Van Stralen KJ, Borzych-Duzalka D, Hataya H et al. ESPN/EDTA registry; IPPN registry; ANZDATA registry; Japanese RRT registry, survival and clinical outcomes of children starting renal replacement therapy in the neonatal period. *Kidney International* 2014; **86**:468–74.  
<https://doi.org/10.1038/ki.2013.561>  
PMid: 24499775
3. Najarian JS, Simmons RL, Tallent MB, Kiehlstrand CM et al. Renal transplantation in infants and children. *Annals of Surgery* 1971; **174**:583–600.  
<https://doi.org/10.1097/0000658-197110000-00005>  
PMid: 4329074 PMCID: PMC1397680
4. Rees L. Management of the neonate with chronic renal failure. *Seminars in Fetal and Neonatal Medicine* 2008; **13**:181–8.  
<https://doi.org/10.1016/j.siny.2007.10.007>  
PMid: 18039598
5. Watson AR, Hayes WN, Vondrak K, Ariceta G, Schmitt CP, Ekim M, et al, European Paediatric Dialysis Working Group. Factors influencing choice of renal replacement therapy in European paediatric nephrology units. *Pediatric Nephrology* 2013; **28**:2361–8.  
<https://doi.org/10.1007/s00467-013-2598-1>  
PMid: 23843162
6. Smith JM, Stablein DM, Munoz R, Hebert D, McDonald RA. Contributions of the transplant registry: The 2006 annual report of the North American paediatric renal trials and collaborative studies (NAPRTCS). *Paediatric Transplantation* 2007; **11**(4): 366–73.  
<https://doi.org/10.1111/j.13993046.2007.00704.x>  
PMid: 17493215
7. McDonald RA, Smith JM, Stablein D, Harmon WE. Pre-transplant peritoneal dialysis and graft thrombosis following paediatric kidney transplantation: a NAPRTCS report. *Pediatric Transplantation* 2003; **7**:204–8.  
PMid: 12756045
8. Dharnidharka VR, Fiorina P, Harmon WE. Kidney transplantation in children. *New England Journal of Medicine* 2014; **371**:549–58.  
<https://doi.org/10.1056/NEJMra1314376>  
PMid: 25099579