

Miami
Transplant
Institute



Pediatric En-bloc Kidney Transplant in Pediatric Recipients The Miami Experience

46th Miami Pediatric Nephrology
Seminar

March 10, 2019

Disclaimer

- Nothing to disclose

Pediatric en-bloc kidney transplants

- 1) First report Meakins JL et al Surgery 1972;71:72
- 2) Pediatric en-bloc kidneys have potential to grow in size (hypertrophy) post-transplantation. DD Nghiem J Urol 1995;153:326

Introduction

- En-bloc kidney transplants (EBKT) have been performed in adults with good results
- Not commonly performed in the pediatric population because of thrombotic complications and poor outcomes
- There is limited, but supportive literature on this form of transplant in children. Winnicki E. J Pediatrics 2016;173:169

Methods

- Retrospective review over 10 year period (2004-2014)
- Total # of patients, n =25
- 18 patients had combined kidney en-bloc transplants
- 7 patients had combined liver-kidney en-bloc transplants

Results

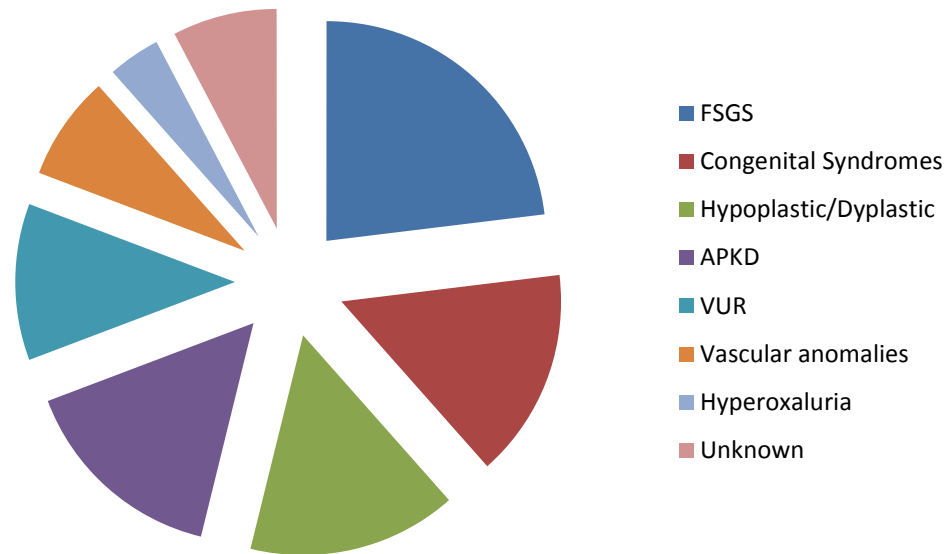
Recipient Demographics

Male	Female
13	12

Race	N
White	6
African American	5
Asian	6
Hispanics	8

Results

- Etiology of ESRD

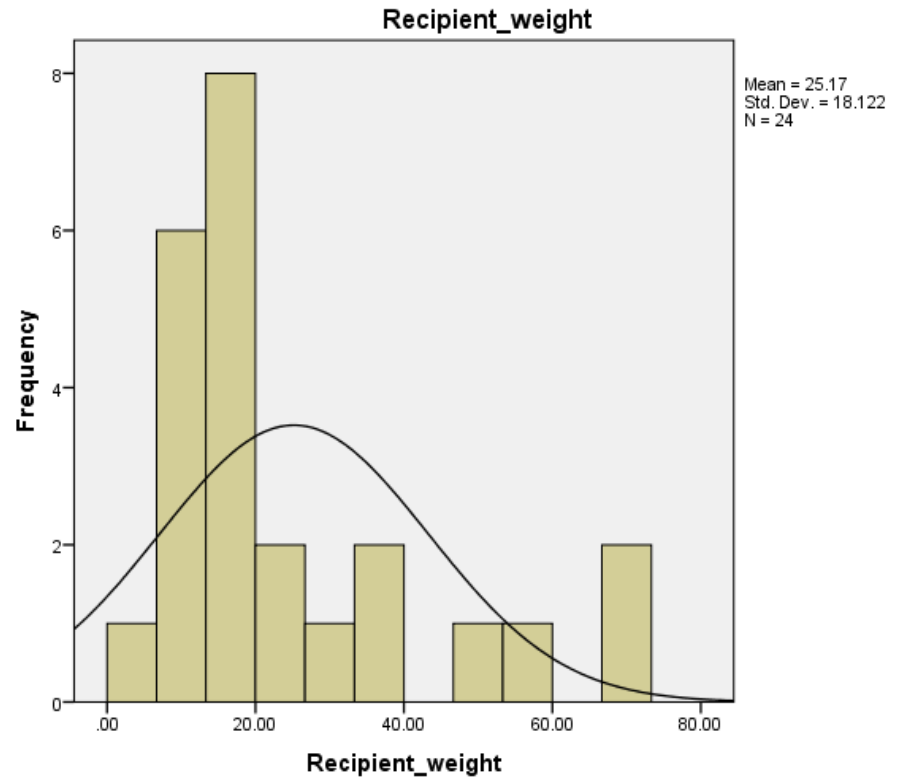
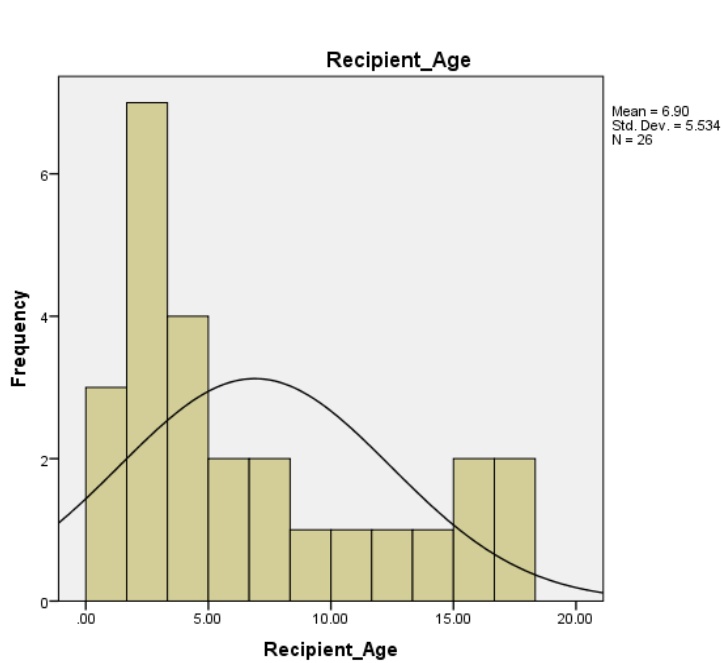


Results

Recipient Characteristics

- Median Recipient age 4.6 years (range 0.9-17)
- Median recipient weight 17.9 kg (range 5.8-21.1kg)

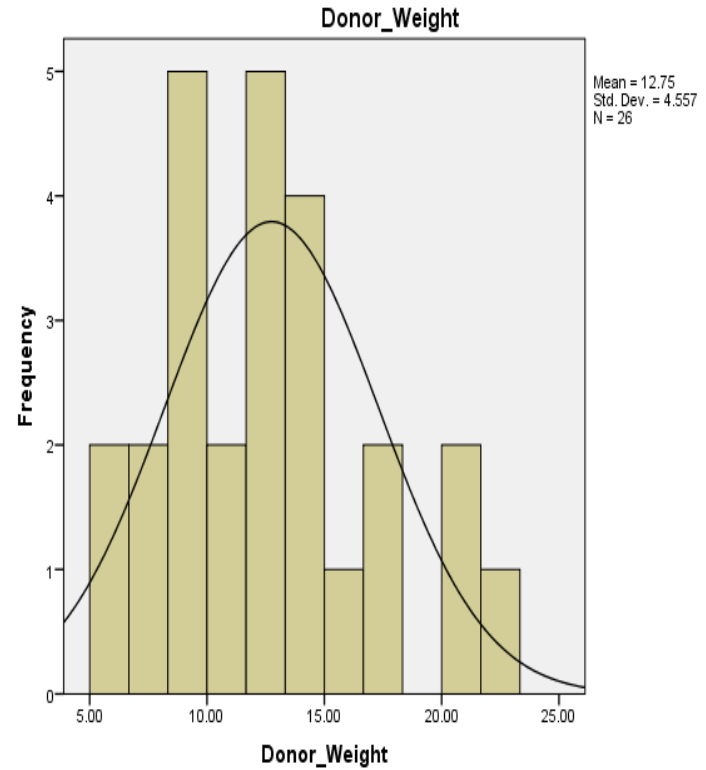
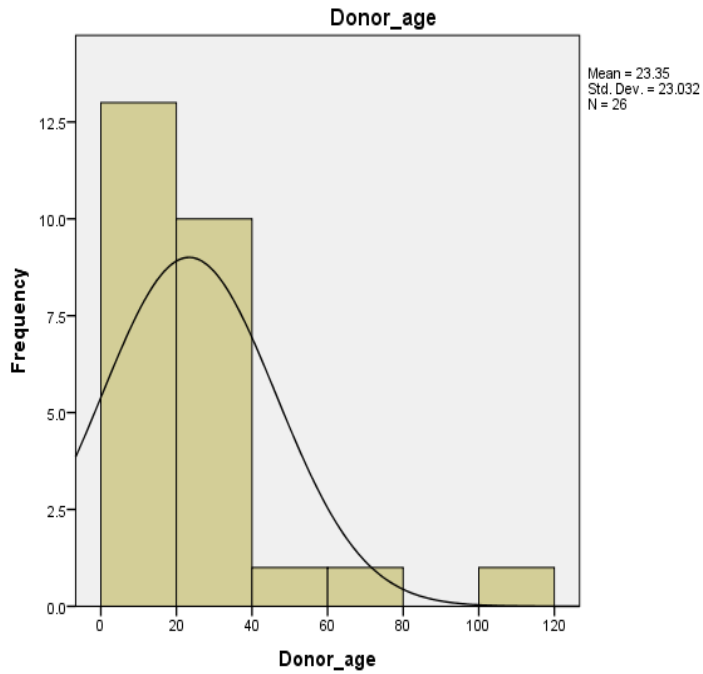
Recipient Age and Weight



Donor Characteristics

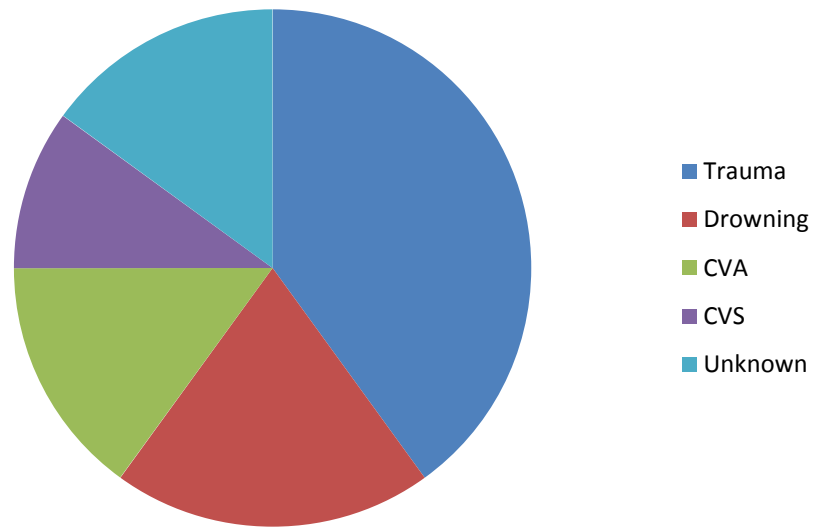
- Median donor age 22 months (2-108)
- Median donor weight 12.0kg (5.8-21.1)
- Mean Pedi En-bloc Kidney Weight **80g**

Donor Age & Weight



Donor Characteristics- Donors after Brain death

- COD



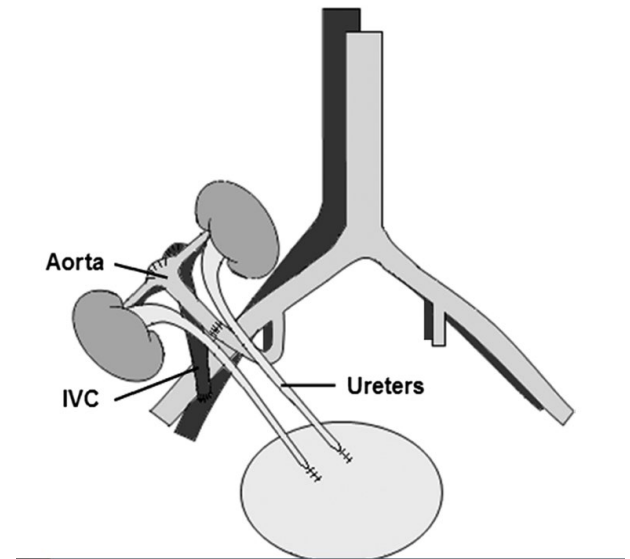
Preservation Pump Parameters

Flow	Pressure	Resistance
56	30/20	0.35

- Mean duration on pump 18.9 hrs
- Mean CIT 20.5 hours
- Mean WIT 57 mins

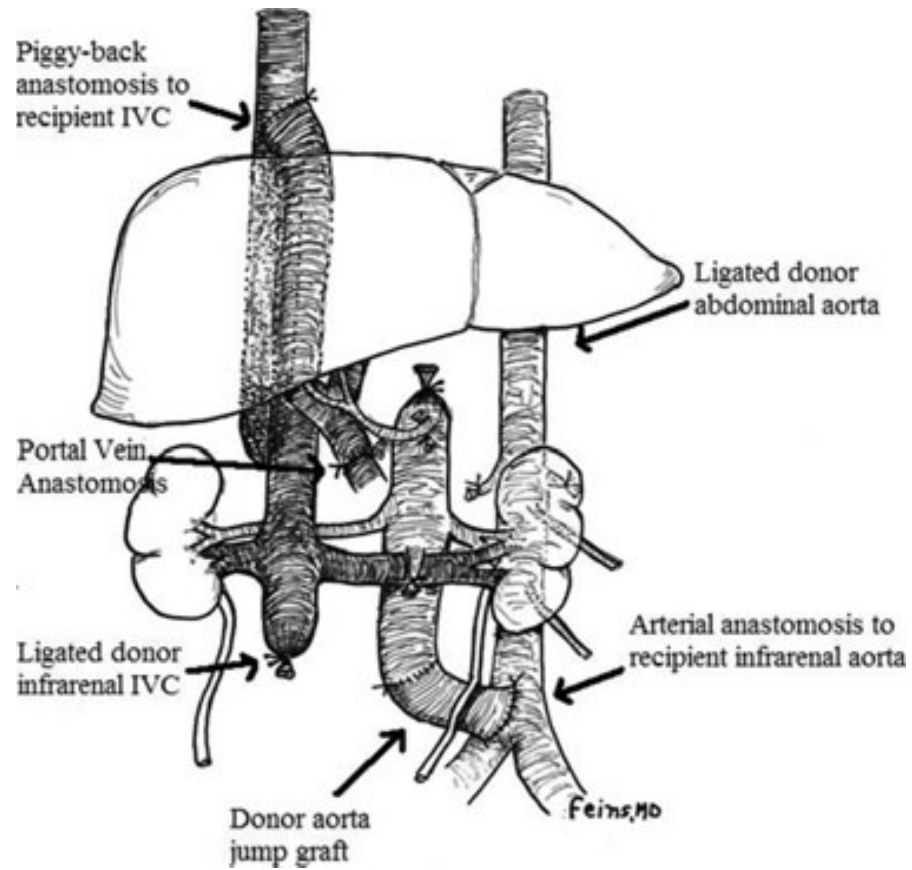
Technique

- En-Bloc Kidney Transplant
- Aortic cap, iliac artery extension
- Vena cava oversew
- Divide internal iliac vein
(if placed on external iliac vein)
- Position like peas in a pod



Technique

- LK enbloc



Anastomosis site

Vascular Anastamosis

Number of cases

CIA/CIV

EIA/EIV

CIA/IVC

Aorta/IVC	8
Common Iliacs	6
External iliacs	5
Common / IVC	1

Induction ISP

- Thymoglobulin
- Zenapax (Anti-CD25), Thymoglobulin
- Thymo, Solumedrol, Simulect (Anti-CD25)

Maintenance

- FK + MMF
- Low dose Aspirin for thrombotic prophylaxis

Complications

Complications	Treatment	Graft Loss
1. Renal artery Stenosis/Urine Leak	Lower pole artery thrombectomy Ureteric Revision	No
2. Allograft ischemia	Revision artery	Yes
3. Kidney Rupture	Mesh wrap	Yes
4. Urine Leak /Malposition	Ureteric Revision Tacked to mesentery	No
5. Allograft Ischemia	Left Nephrectomy 5 months later	No

5/25 complications requiring reoperation; 2 graft losses

Results

- 1 mortality in this series –intraoperative cardiac arrest from L/K patient
- 1 year patient survival 96%
- 1 year graft survival 88%

Results

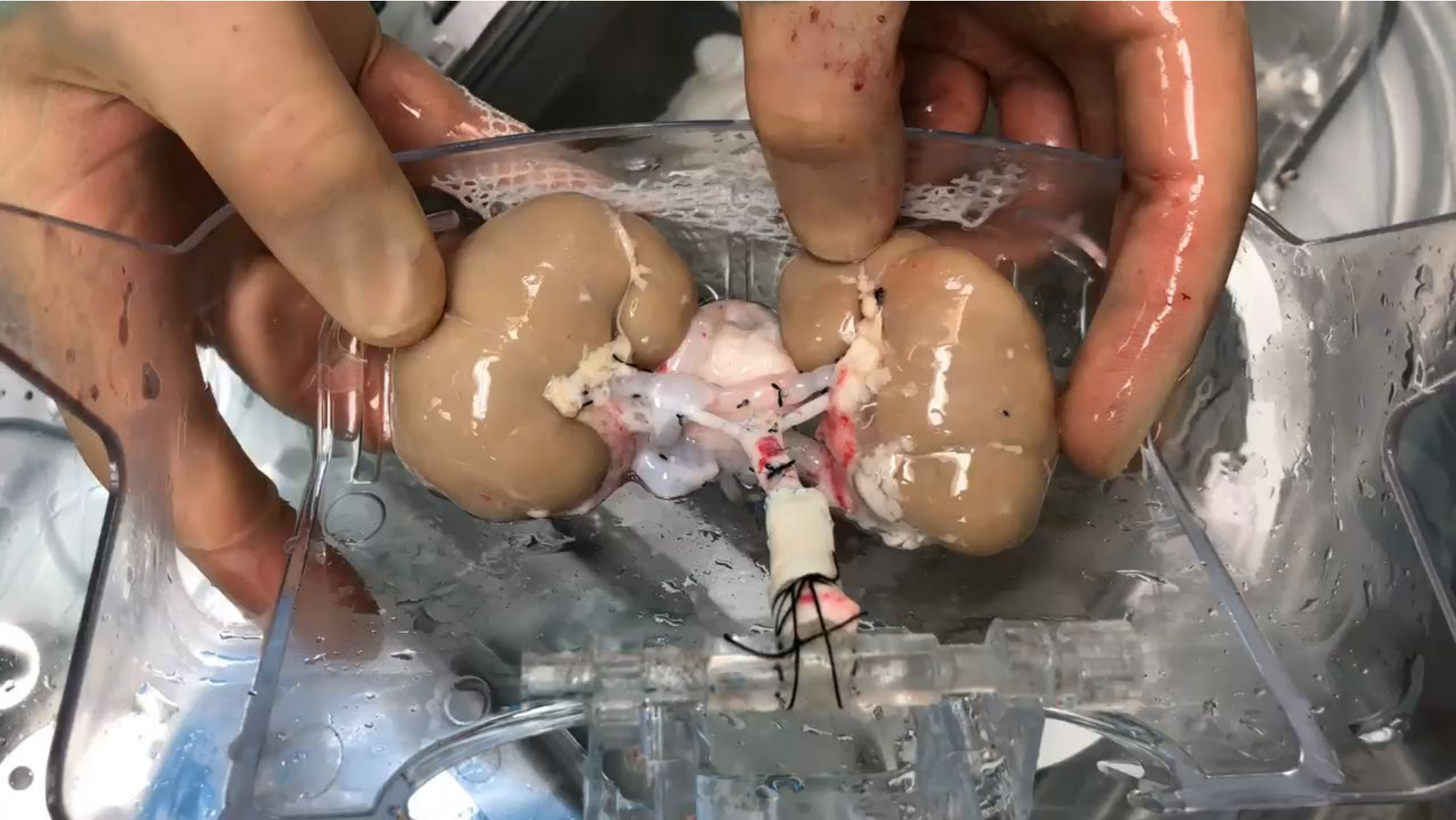
- Graft function-median creatinine

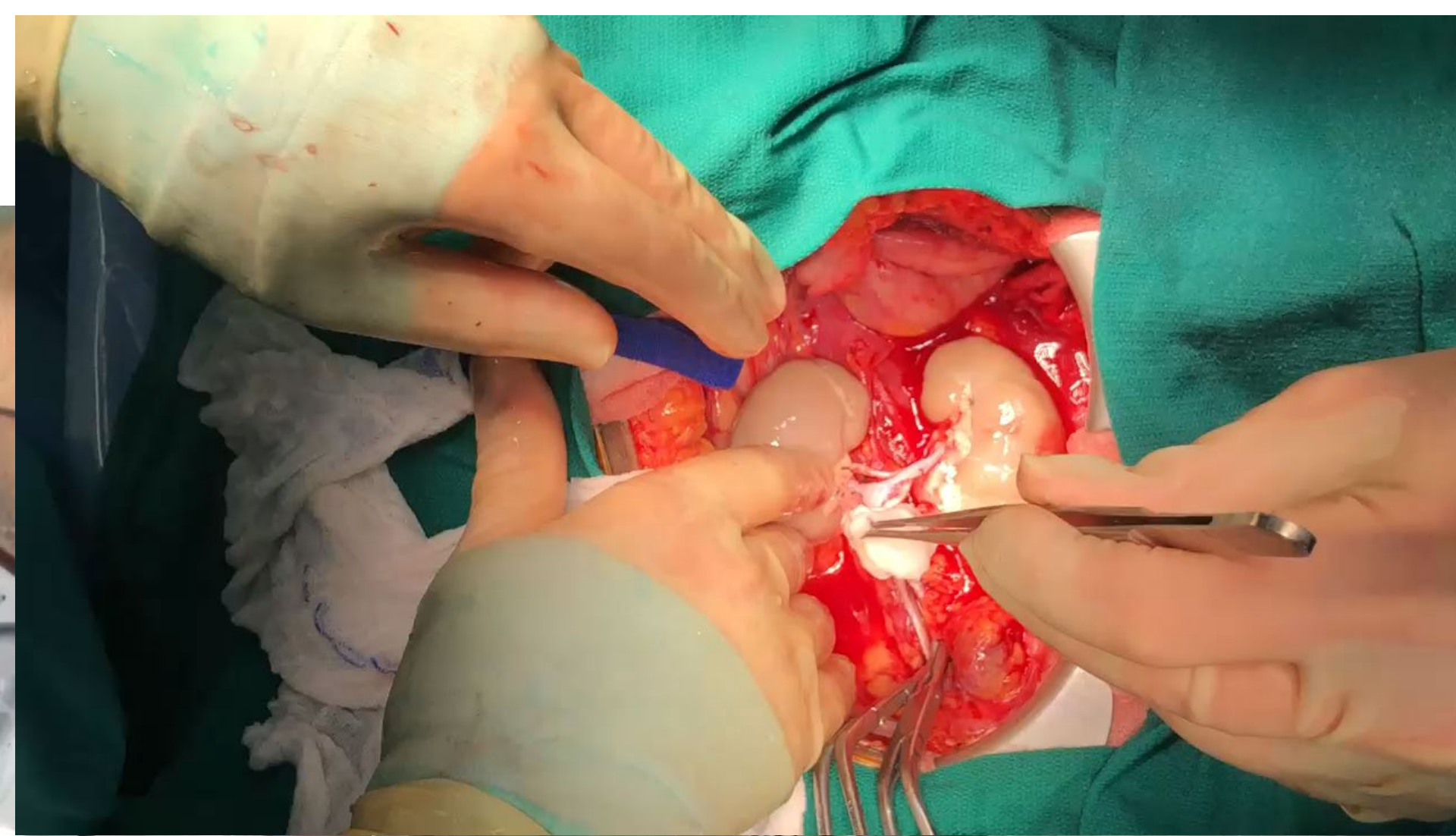
	Serum Cr		
1 year	0.42		
3 year	0.51		
5 year	0.62		

Discussion

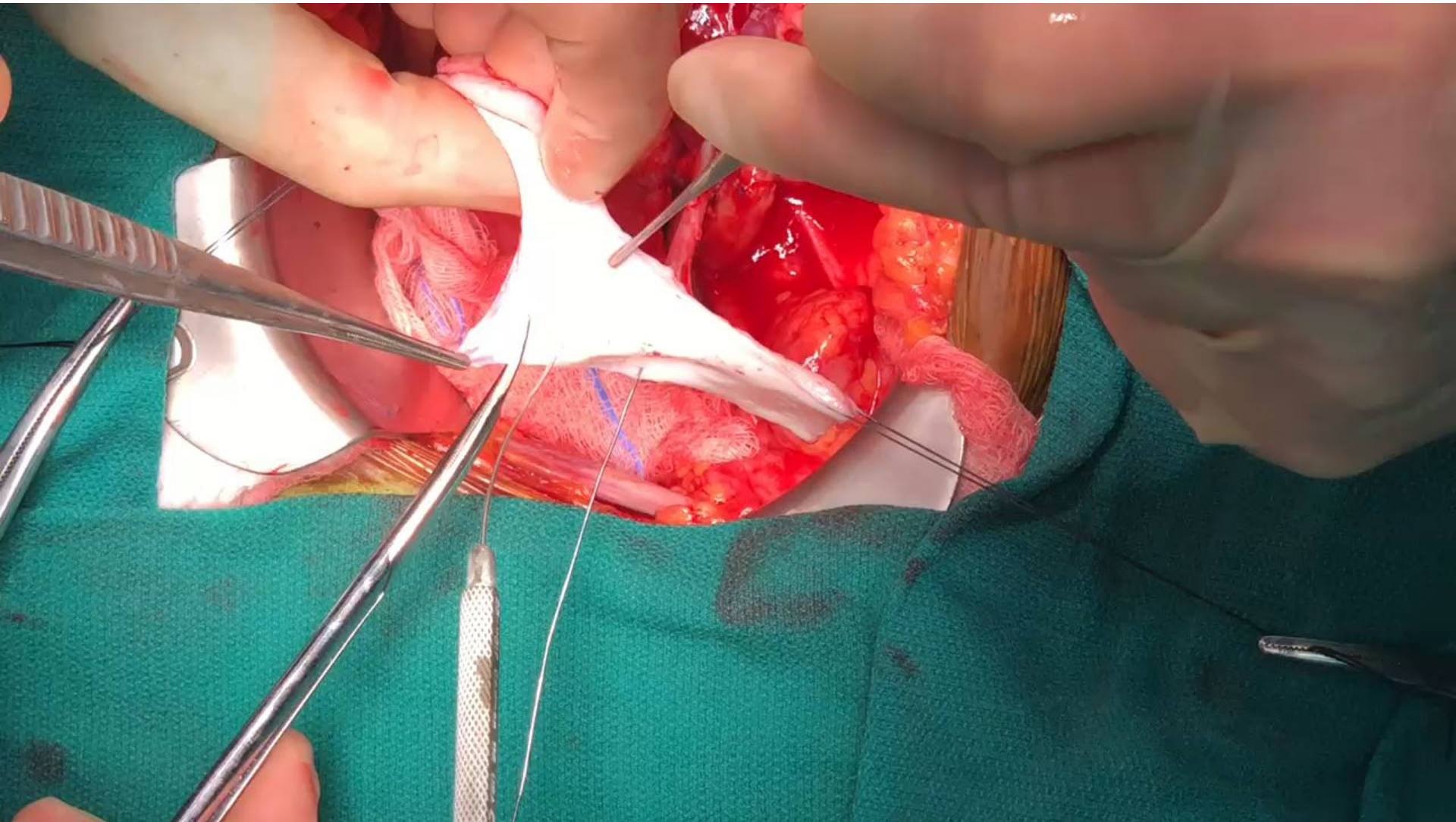
- Technically challenging
- Not many centers perform pedi-en-bloc in pediatric recipients
- Results in adult recipients are comparable

Pediatric en-bloc kidneys on Pump





Bladder Patch Technique





Deceased Pediatric Donor Issues

- 1) Technical complications including vascular thrombosis (multiple renal arteries)
- 2) Late events: hypertension/renal artery stenosis, proteinuria

Deceased Pediatric Donor Issues

- 1) Should en-bloc kidneys be split, or used en-bloc? What is the minimal size to justify use of single kidney?

- Transplantation in press (China) Zhu L et al.

Single kidneys from: very small (1.7 years (.7-3 years); 6.5 cm (5-8cm); vs small (8 years (3.5-11 years); 8cm (6-9cm) donors. Results at 1 year comparable, ~90% graft survival.

Recipients of very small kidneys were small, young Chinese women.

Pediatric Kidney Recipient Issues

- 1) Infants/small children receiving adult kidneys likely to experience hypoperfusion/possible hypotension. J Transplantation 2014 J. Donati-Bourne et al.
- 2) Children should receive size-matched kidneys. Pape L. Young for Young (editorial) Ped Neph 2007;22(4):477

Although adult kidneys may serve an adult pop better, depriving children access will reduce the number of pediatric KT's performed.

Pediatric Kidney Recipient Issues

- Infants, children, adolescents likely to need at least two KT's during lifetime. Does order matter (DD vs LD)?

Segev, DL. Transplantation 2013;96(5):487

Living Pediatric Kidney Donor

- Rare instance of Twin kidney donation
- Judge/Court order necessary.
- Twenty years and counting!

Conclusion

- Optimal Allocation of Pediatric Deceased Donor Kidneys Needs Further Investigation/Study.
- Thank You