

A case report of Ex-vivo endovascular repair of renal artery aneurysm in cadaveric renal allograft

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Background

- Renal artery aneurysm (RAA) is a rare condition – 0.7%
- Most commonly asymptomatic.
- Diagnosis is made incidentally during evaluation of different conditions, such as living donor workup.
- Treatment in most of the cases can be successful with surgical or endovascular repair.
- Up to 20% will eventually need a nephrectomy or ex-vivo aneurysm repair/reconstruction and subsequent auto transplantation.

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Shortage of organs



Increasing number of patients with ESRD



expansion of the selection criteria promoting the use of organs from marginal donors.

Use of kidneys with RAA is one such example

Background

- In the literature, reports are mostly about living donor renal artery aneurysms.
- to our knowledge, there is no report of Ex-vivo endovascular repair of RAA in a cadaveric donor transplantation.

Case series: Transplantation of kidneys from donors with renal artery aneurysm

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Three patients underwent right hand-assisted laparoscopic nephrectomy and one patient underwent left nephrectomy.

The aneurysm was identified and excised at its ostium using fine scissors (Fig. 2). The edges of the arterial defect were approximated with 7/0 Prolene® suture in running fashion (Fig. 3). In one case, a segment of the donor gonadal vein was incised longitudinally and wrapped over the reconstructed renal artery to reinforce the site of repair. Then the edges of the venous patch were sewn with 7/0 Prolene in running fashion (Fig. 4).

Case Report

- Male, 47 yrs suffering from ESRD,
- Lt. Nephrectomy at age 12 (unknown cause).
- On Hemodialysis since 1996.
- Kidney transplantation (Rt Fossa) - 1997,
- Back to hemodialysis due to Chronic allograft nephropathy - 1999

❖ Medical History

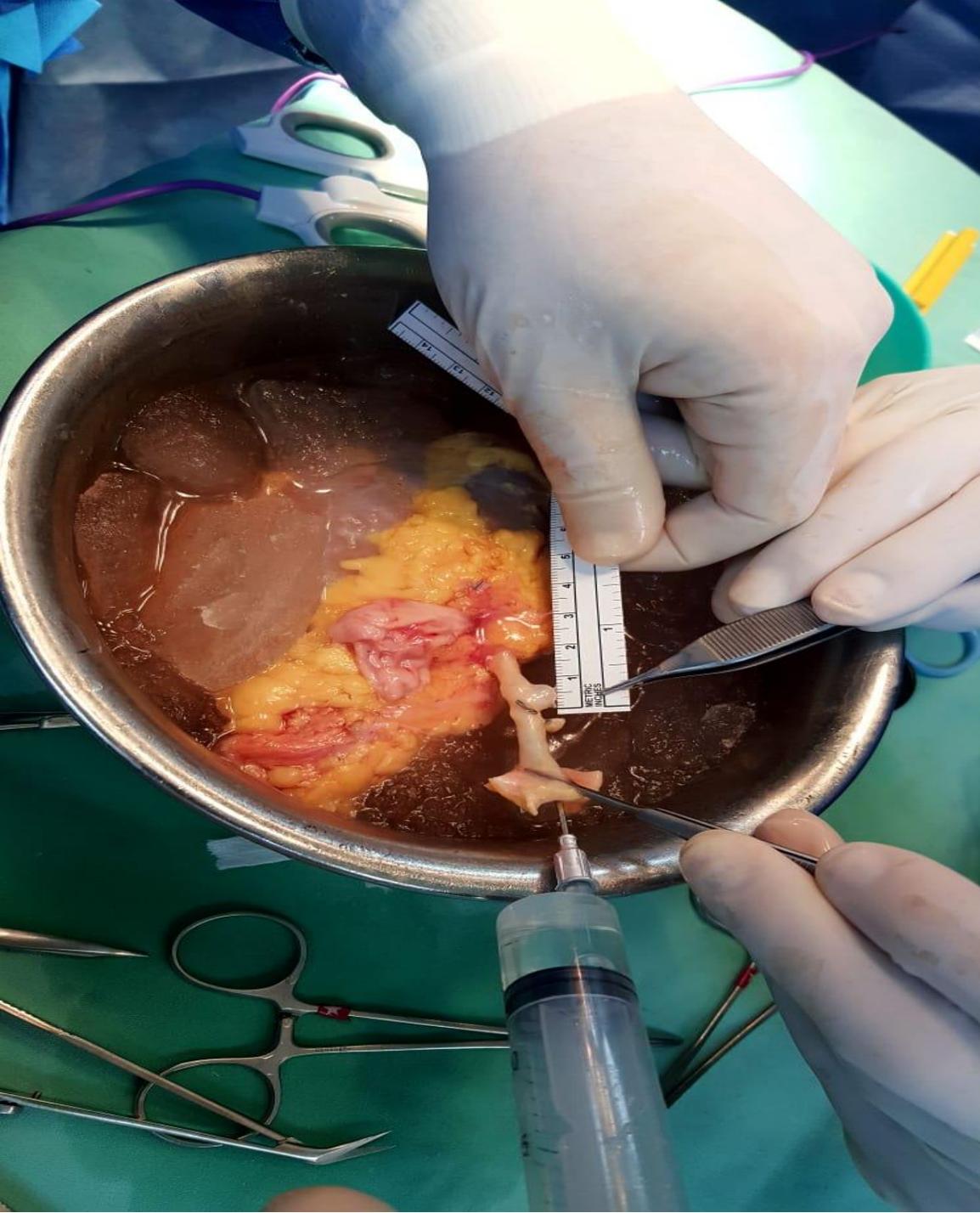
- Hypertension
- Secondary hyper-parathyroidism
- s/p Parathyroidectomy 3.5 glands (2005),
- s/p Vesicoureteral Reflux

Case Report

- Admitted in February 18th, 2019 for urgent cadaveric kidney transplantation.

❖ 19/02/2019

- Kidney was prepared on the back table and a wide base saccular aneurysm of 9 mm in diameter was observed in a single renal artery, 2 cm proximal to hilum.
- No other vascular variants or injuries were detected.
- Cold ischemic time- 8.5 hours.



Case Report

❖ Reconstruction options (Ex-vivo) :

- Excision of the aneurysm and suturing the base by lateral suture
- Excision of the renal artery containing the aneurysm → short stump
- Excision of the aneurysm and repair with interposition synthetic graft → increase in Infection events.
- Endovascular repair with stent graft.

Case Report

❖ Ex-vivo reconstruction

- Endovascular repair with two stent grafts (Atrium 6X22 mm with not enough distal overlap so another 5X22 mm stent graft was inserted with good apposition).
- PTA with 6 mm Balloon.
- The kidney was transplanted in a regular fashion to the External Lt Iliac artery and vein.
- **Post Op DUS –**
 - Parenchyma within normal limits and no hydronephrosis.
 - Normal flow in the arteries and veins inside the kidney with normal pattern.
 - Flow velocity couldn't be estimated in the main renal artery d/t air around the anastomosis.

POD-1

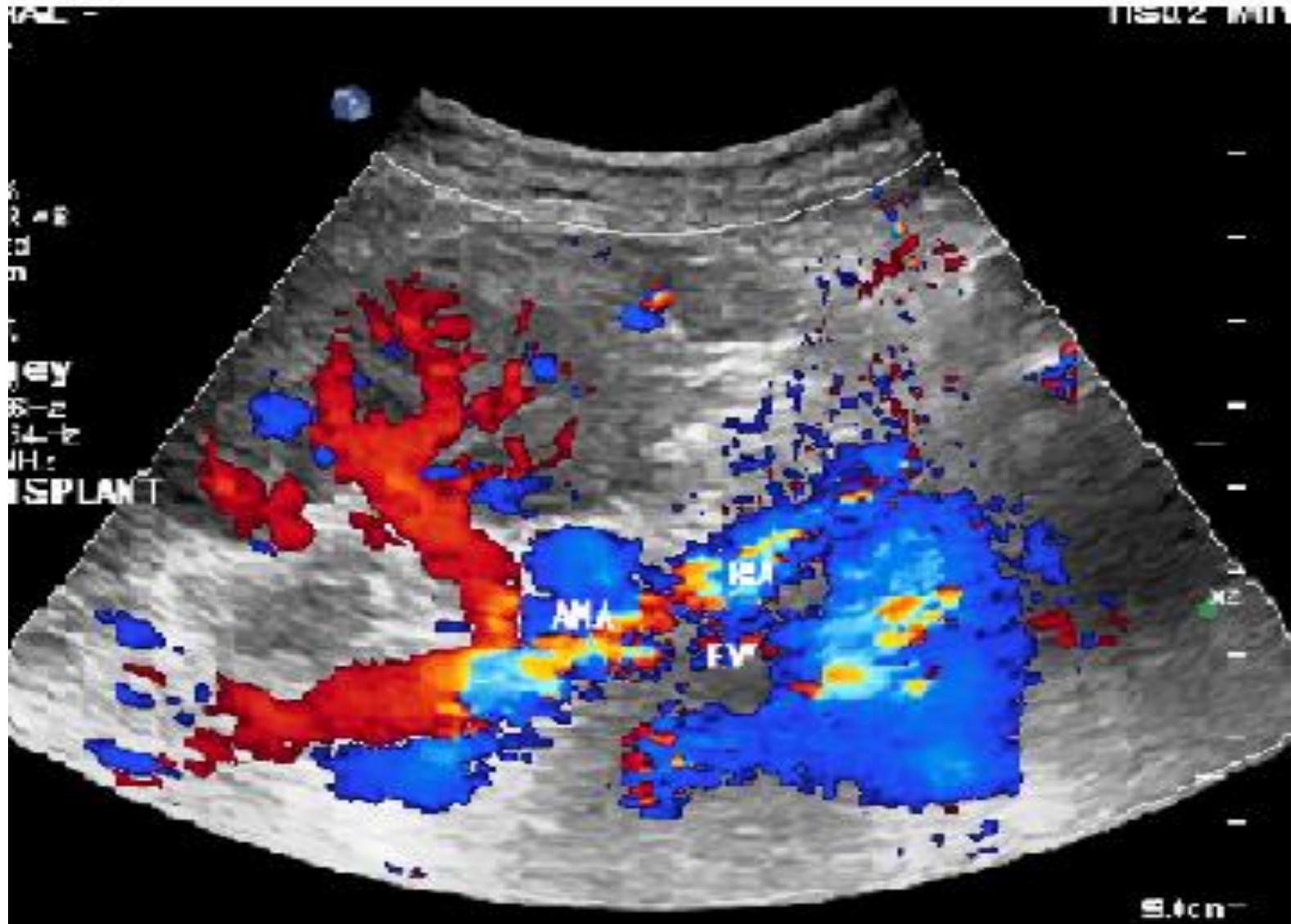
- Stable with good recovery, Small amount of urine.
- Serum creatinine dropped (12→7 gr/dl).
- **DUS**
 - Kidney parenchyma and size in the normal limits.
 - Normal blood flow inside the kidney. RI=0.7.
 - PSV (main renal artery= 30 cm/sec).
- **Radioisotope renography (MAG3)**
 - Good perfusion and kidney concentration
 - Delay in secretion
 - PI= 78%
 - ATN
- Treatment with Heparin IV.drip post operative switched to Tab. Plavix.

POD-2

- Stable , Small amount of urine.
- Serum creatinine 8.9 (gr/dl).
- **DUS**
 - Kidney parenchyma and size in the normal limits.
 - Normal blood flow inside the kidney. RI=0.86.
 - PSV (main renal artery)= 200 cm/sec
 - A circular flow was demonstrated inside the aneurysm m/p endoleak type 1B.

POD-2

- DUS

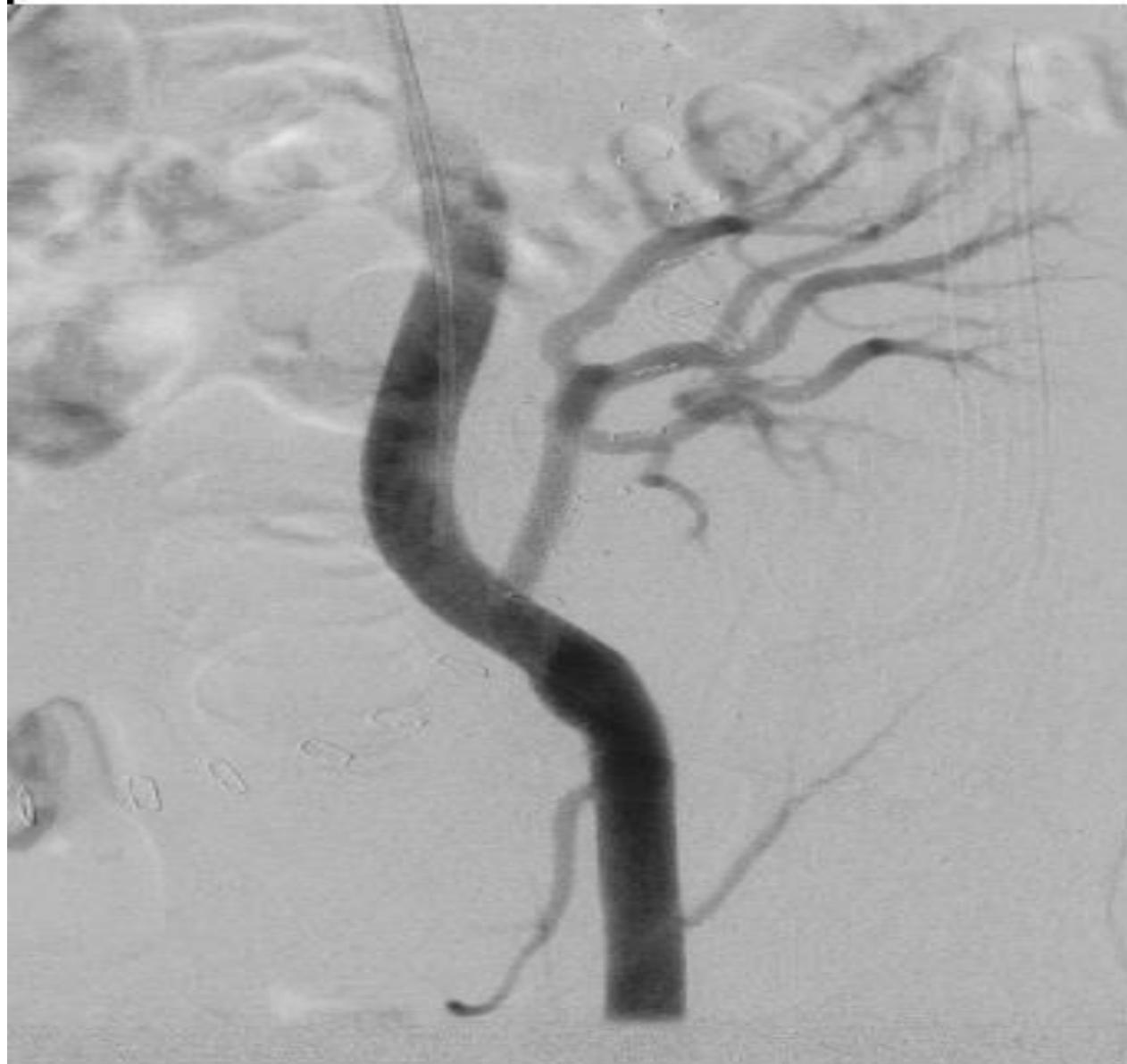


Susp. Endoleak 21.02.2019

A duplex US post operative with suspicion of Endoleak

POD-2

- **Angiography**



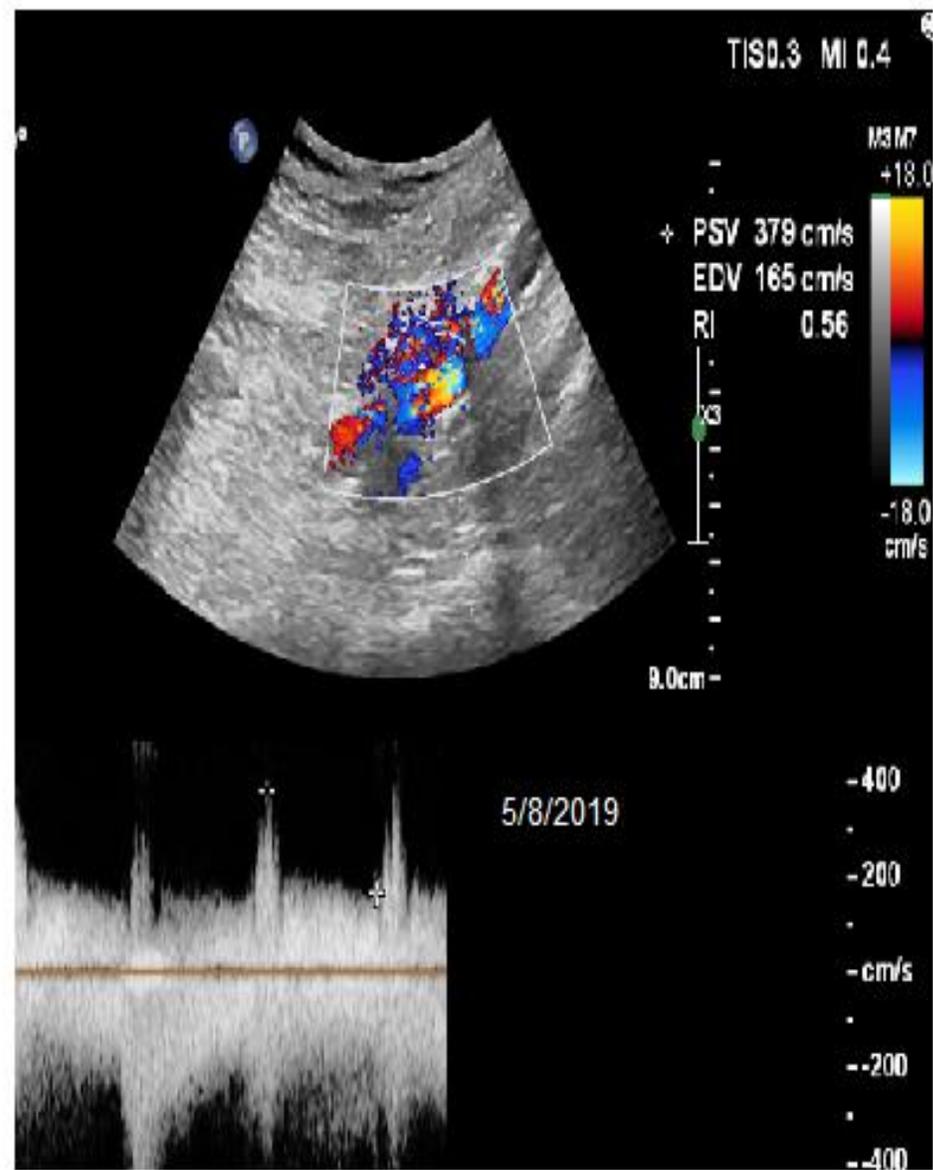
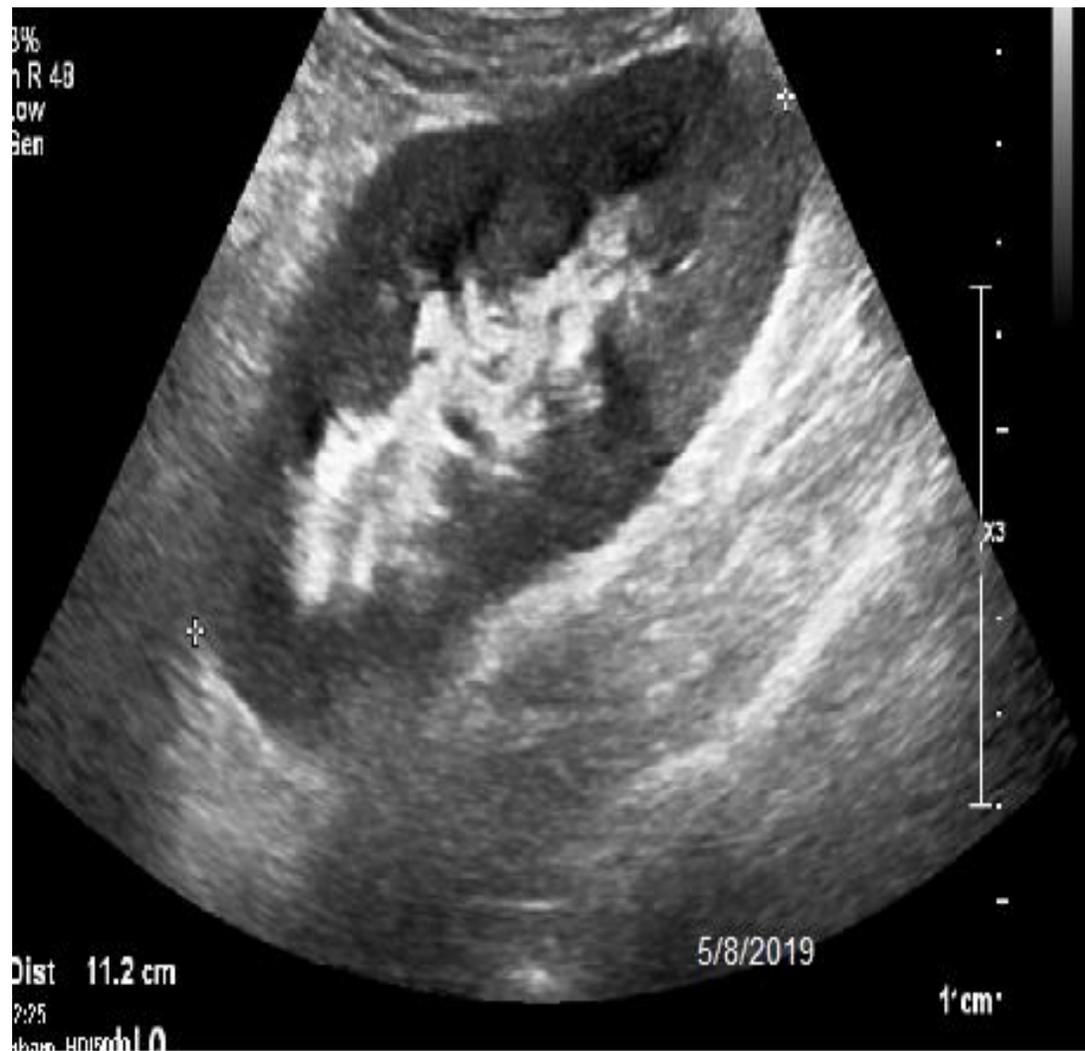
angiography was done
showing no Endoleak
21.02.19

Post transplantation

- Stable
- No complaints
- IV ATG- 7 doses d/t delay in kidney function and a previous transplantation.
- Increasing in the quantity of the urine
- Creatinine around 2 gr/dl
- Treatment with Myfortic & Prograf
- **DUS** (POD-13) – normal limits, normal PSV, RI=0.78, No aneurysm.
- Discharged – POD-13 with creatinine 2.5 gr/dl

August 2019

- Outpatient transplant clinic
- Feeling good
- Creatinine – 2 gr/dl
- **DUS :**
 - Normal cortex and echogenic
 - Length- 11.2 cm
 - PSV (main renal artery- **447** cm/sec)
 - Tardus parvus pattern
 - RI- 0.63



September 2019- Admission for Angiography

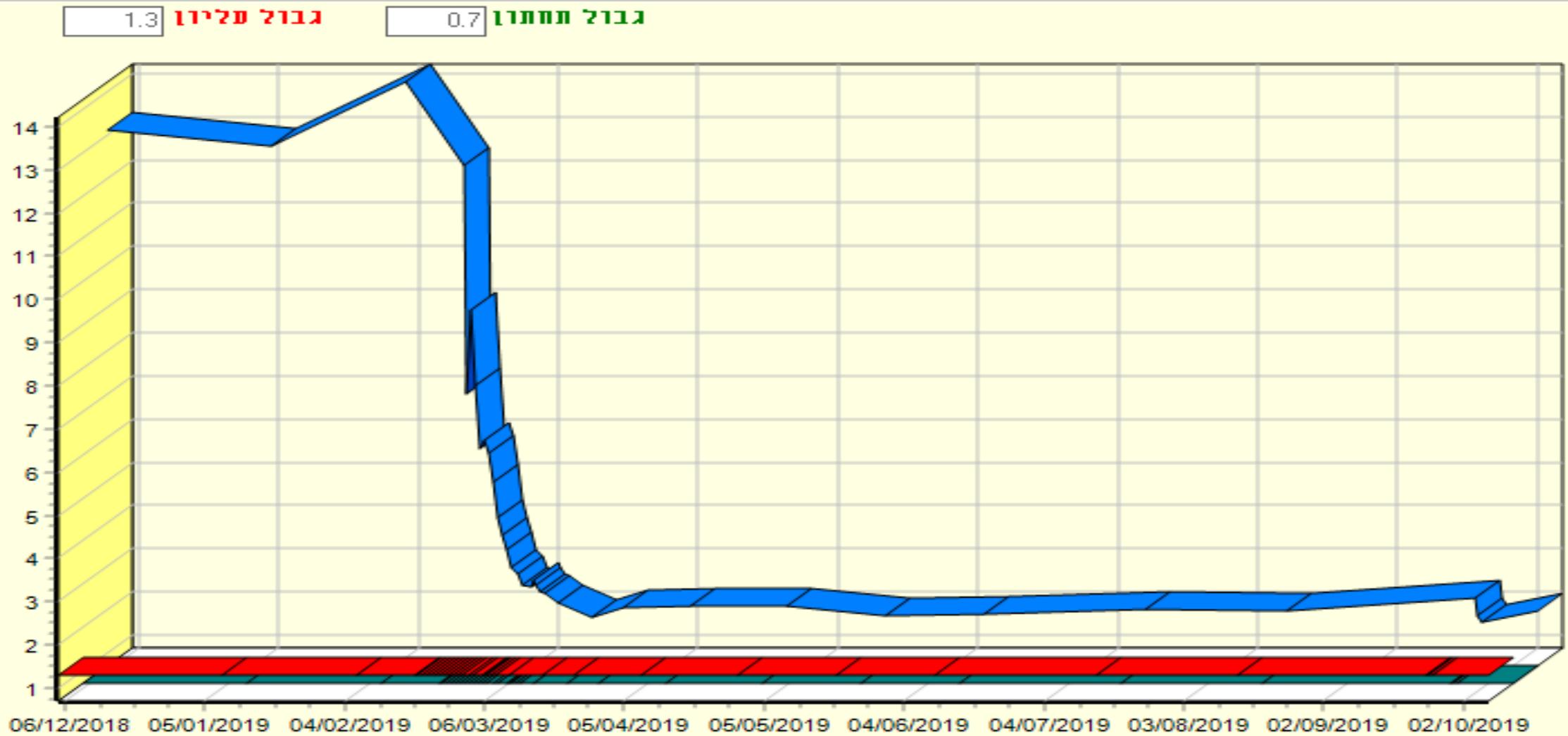


Follow up – outpatient transplant clinic

- Doing well
- No complaints
- Creatinine – 1.76 gr/dl
- The patient is now 2 years and 9 months post transplant and is doing well with acceptable graft function.

Serum creatinine

Creatinine-BL : בדיקה



Discussion

- Shortage of organs has led to the increasing use of kidneys from marginal cadaveric donors and living donors with surgically correctable lesions.
- RAA is rare.
- Reports are mostly about living donor renal artery aneurysms (Toda et al -7 cases, Alameddine et al -4 cases).
- To our knowledge, there is no report of saccular RAA repair in a cadaveric donor transplantation.
- In the case of RAA from cadaveric donor, attempts should be done for back-table reconstruction.

Conclusion

- Ex vivo endovascular repair of RAA of a kidney allograft can be performed safely when surgical repair is considered complicated.