

Chief Complaint

Abdominal Pain

History of Present Illness

14-year-old male with pertinent history of congenital hypoplastic kidney disease and CKD s/p right renal transplant in 2013 presents with 3 days of intermittent, crampy, left lower quadrant abdominal pain. It is not associated with any fevers, chills, nausea, or vomiting. He also reports intermittent nonbloody loose bowel movements for 3 days. Patient's mother gave Gas-X at home with only mild relief of pain. He states he had similar pain once before ~ 2 months ago when he was diagnosed with appendicitis and was admitted to the hospital.

Per chart review, the patient was admitted ~2 months prior to presentation after having CT findings of acute appendicitis. However, due to patient testing positive for COVID-19 infection 2 weeks prior to the diagnosis of appendicitis, the patient was treated non-operatively with a 10-day course of IV and PO antibiotics. The patient was recommended to follow up with pediatric surgery clinic for an elective surgical intervention after a negative COVID-19 testing.



Fig. 1 CT abdomen and pelvis with contrast, axial view



Fig. 2 CT abdomen and pelvis with contrast, coronal view

Case Discussion

Due to recent history of appendicitis, initial differential diagnosis favored recurrent appendicitis with/without perforation or abscess. CT abdomen and pelvis with contrast was obtained, which showed superior renal vein thrombosis of the right transplanted kidney. Pediatric nephrology, hematology, infectious disease, and transplant surgery were consulted in the ED. Patient was given gentle fluid resuscitation (given history of CHF, OSA on BIPAP), started on heparin gtt, and was admitted to PICU.

During admission, the patient was evaluated by multiple specialty teams. Per hematology, further hypercoagulable workup was completed to investigate triggers for thrombosis; however, workup was negative. Per nephrology, thrombosis was monitored by daily renal doppler ultrasound. Per infectious disease, the patient was treated as possible MIS-C with IVIG, daily aspirin, and decadron course.

For renal vein thrombosis, the patient was treated with IV heparin while his acute kidney injury was recovering. Patient briefly required hemodialysis while inpatient. Once kidney function was improving, the patient was transitioned over to Lovenox. Patient was discharged on BID dosing of Lovenox.

Pearls

- ❖ Renal vein thrombosis is a rare but graft threatening event, responsible for 2-7% of early allograft losses in adults and up to 35% in children. Generally, it occurs early post transplant (<2 weeks) prior to development of collateral venous outflow
- ❖ Most common predisposing factor during early post transplant period is due to anatomic abnormalities and technical problems during the surgery (prolonged ischemia time). Another crucial factor is hypovolemia
- ❖ There are many correlations with active or recovered COVID-19 infection and hypercoagulability in patients. For this case, timing of the renal vein thrombosis was unusual in that it occurred 7 years after uncomplicated transplant surgery. Given this patient's recent COVID-19 infection (and otherwise a negative hypercoagulable workup), it is believed that one of the factors that contributed to his prothrombotic state

Pertinent Physical Exam

Vitals BP: 123/51, HR 88, RR 24, Temp 98.1F, SpO2 96% on room air
Height: 5' 1", weight: 155 kg (342 lbs), BMI 65.6

General: Sitting on the gurney, appears uncomfortable, in moderate distress

Respiratory: Tachypneic, equal air entry bilaterally, clear to auscultation

Abdominal: Soft, non distended, LLQ tenderness to palpation, no rebound, no guarding. No CVA tenderness bilaterally

Pertinent Laboratory Data

WBC 20.8
BUN 18, creatinine 1.5 (baseline creatinine 0.8-0.9)
D-dimer 5.5

Questions & Answers

Questions:

1. What is the diagnosis and what is the initial management?
2. What are predisposing factors for this diagnosis?
3. What might have been predisposing factors for this patient?

Answers:

1. Renal vein thrombosis. Initial management is anticoagulation. Other management options are thrombolytic therapy or mechanical thrombectomy
2. Hypovolemia, atherosclerosis, post-transplant surgery complications due to anatomic/long cold ischemia time, high dose steroids, antiphospholipid antibodies
3. Multifactorial: pro-thrombotic state caused by COVID-19, dehydration from recent diarrhea, morbid obesity/immobility

References

- Claudio Ponticelli, Marco Moia, Giuseppe Montagnino, Renal allograft thrombosis, *Nephrology Dialysis Transplantation*, Volume 24, Issue 5, May 2009, Pages 1388-1393
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Lerman M, Mulloy M, Gooden C, et al. Post transplant renal vein thrombosis, with successful thrombectomy and review of the literature. *Int J Surg Case Rep*. 2019;61:291-293