

Surgical Repair of a Neonatal Mycotic Common Iliac Artery Aneurysm

In the Setting of Renal Dysplasia and Intestinal Malrotation

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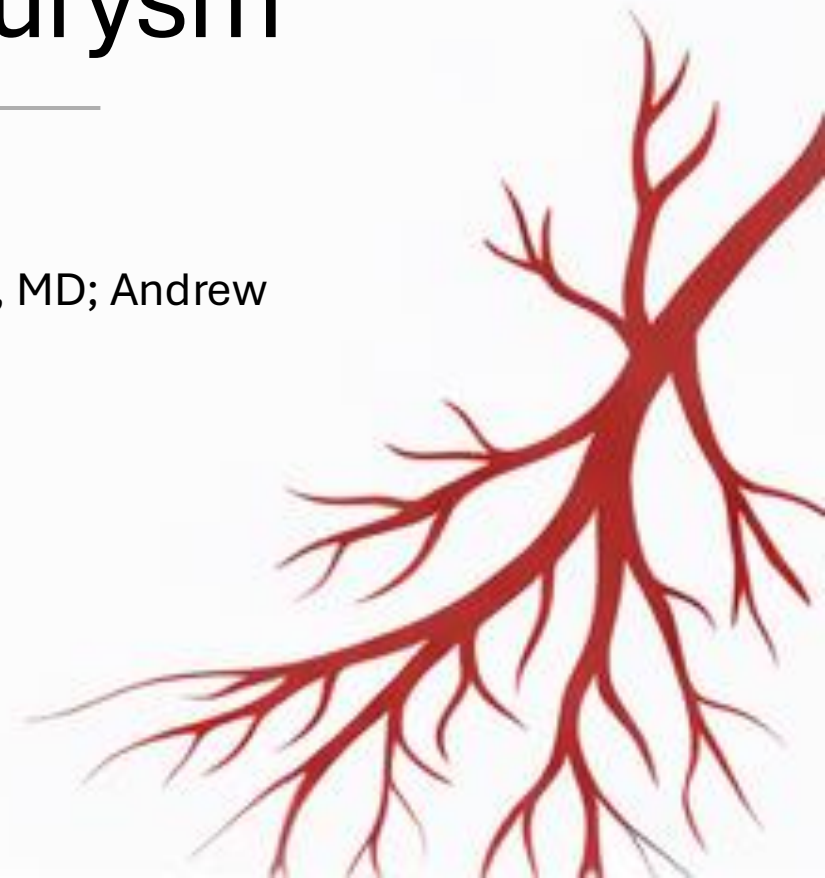
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Background

- Neonatal arterial aneurysms are exceptionally rare
- Mycotic iliac artery aneurysms in neonates present unique challenges:
 - Baseline vessel diameter ~3mm
 - Fragile arterial wall architecture
 - Limited blood volume tolerance
 - Ongoing somatic growth
 - High rupture risk
 - No standardized reconstructive approach
- Most reported cases are associated with:
 - Umbilical arterial catheterization
 - Prior infection
 - Iatrogenic injury



Clinical Presentation

7-week-old male

Medical history:

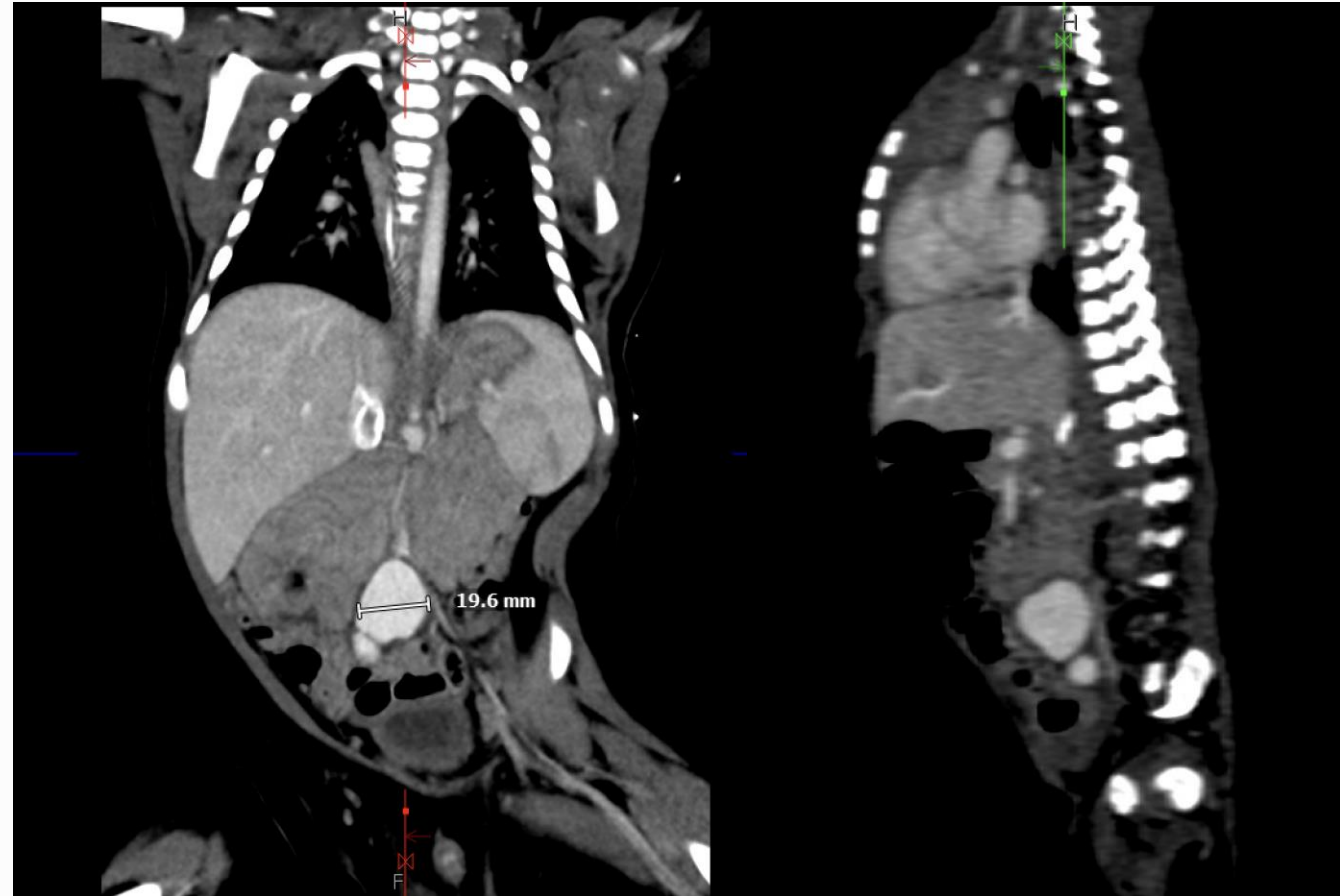
- Prematurity (born at 35 and 1/7 weeks)
- Unilateral renal dysplasia → Chronic Kidney Disease
- Severe protein-calorie malnutrition
- Feeding intolerance
- Prior umbilical arterial and venous catheterization
- Methicillin-resistant *Staphylococcus aureus* bacteremia with myositis

Imaging findings:

- ~2-cm fusiform right common iliac artery aneurysm (CIA; ~6.7-fold dilation)
 - Proportionally equivalent in adult: ~ 5.5–6.5 cm CIA aneurysm
- Intestinal malrotation

Implications

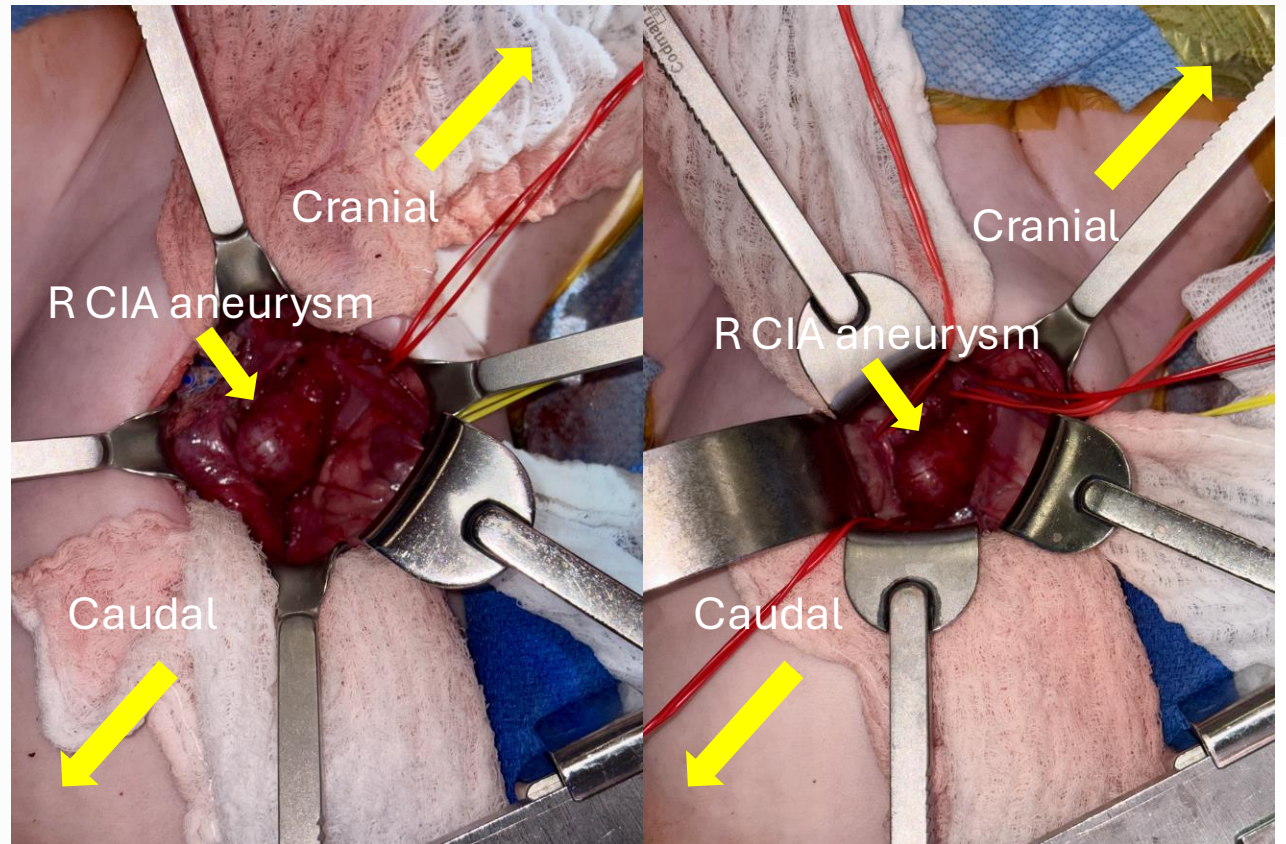
- Markedly elevated wall tension
- High rupture concern
- Strong suspicion for mycotic etiology
- Urgent intervention warranted



Operative Strategy

- Multidisciplinary approach:
 - Pediatric Surgery
 - Vascular Surgery
- Operative Sequence:
 1. Transverse laparotomy
 2. Ladd's procedure to correct malrotation
 3. Circumferential dissection of infrarenal aorta and bilateral iliac arteries
 4. Systemic heparinization
 5. Proximal and distal vascular control with vessel loops

Close coordination with anesthesia given limited circulating volume and low tolerance for blood loss.



Aneurysm Excision

- 2cm fusiform right CIA aneurysm identified
- Aneurysm sharply excised
- Perivascular inflammatory tissue debrided
- Specimen sent for culture and pathology

Care taken to:

- Preserve adjacent venous structures
- Protect ureter

Clamp time minimized.



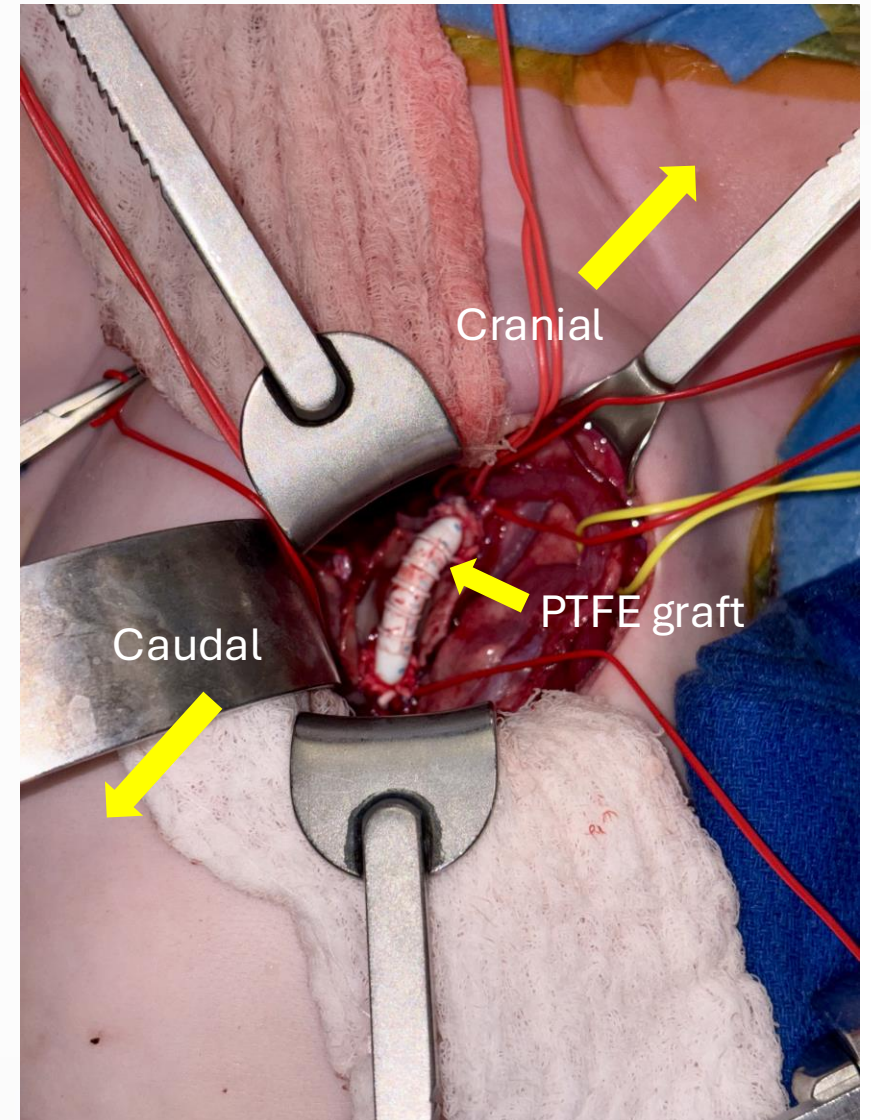
Reconstruction Technique

Conduit Selection

6-mm ringed PTFE graft selected based on:

- Closest available size matching distal iliac caliber
- Avoidance of severe size mismatch
- Ringed configuration to prevent kinking within small abdominal domain
- Technical reliability in urgent setting

Graft soaked in rifampin prior to implantation due to suspected mycotic etiology and prior MRSA bacteremia.



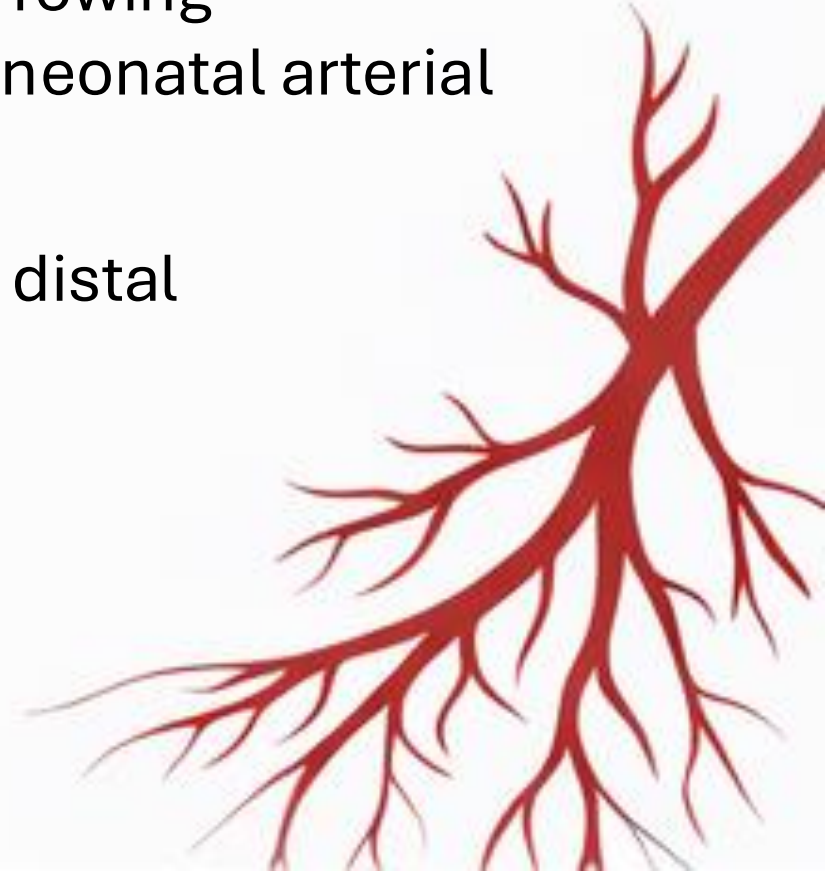
Anastomotic Technique

- Interrupted, pledgeted 6-0 Prolene sutures
- Fine taper needle to minimize intimal trauma
- Evenly spaced sutures to prevent purse-string narrowing
- Pledgets used to distribute tension across fragile neonatal arterial wall

Proximal anastomosis completed first, followed by distal anastomosis under direct visualization.

Technical priorities:

- Avoid luminal narrowing
- Achieve meticulous hemostasis
- Limit clamp time



Rationale for Open Reconstruction

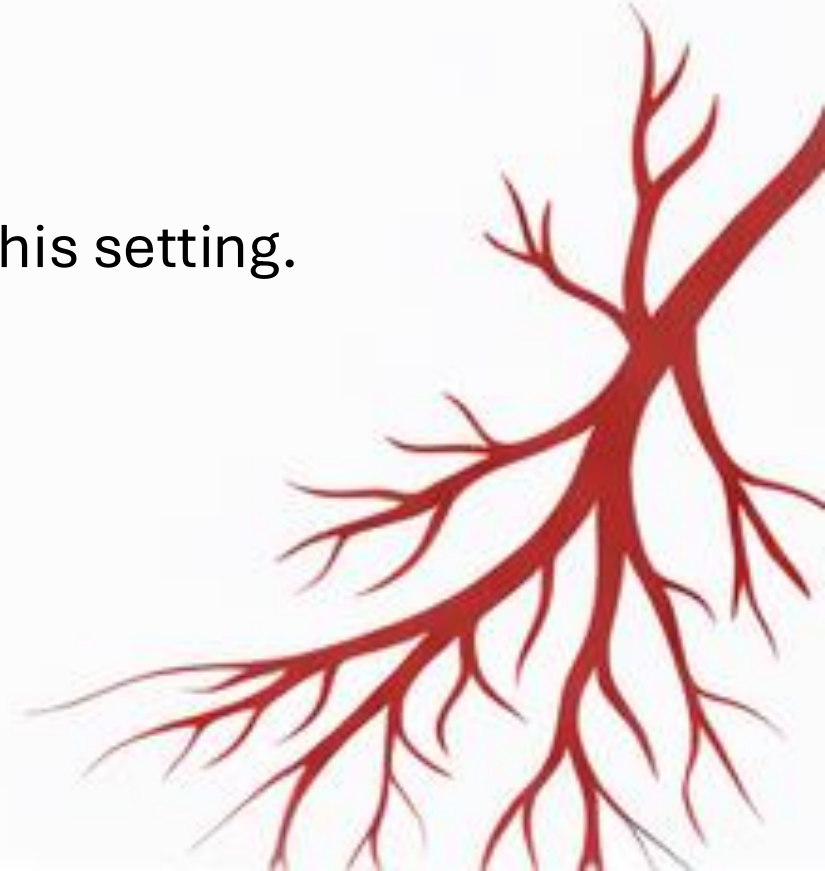
Endovascular approach not feasible due to:

- Vessel caliber incompatible with device profiles
- Concern for infection
- Need for durable reconstruction in growing infant

Autologous vein options limited in size and durability in this setting.

Open reconstruction allowed:

- Complete debridement
- Infection-conscious graft preparation
- Precise anastomotic control



Postoperative Outcomes

- No intraoperative complications
- Aneurysm cultures negative
- Postoperative imaging: patent graft, no leak, no thrombosis
- Preserved distal perfusion
- Stable renal function

Complications:

- Surgical site infection (managed)
- Ongoing nutritional challenges

No early vascular sequelae.

Long-Term Considerations:

- Serial duplex surveillance planned until aneurysm size warrants intervention, followed by CT imaging
- Monitoring for graft size mismatch with somatic growth
- Potential need for future revision
- Multidisciplinary follow-up (nephrology, pediatrics, surgery)



Conclusions

- Neonatal iliac aneurysms are rare and life-threatening
- Proportional dilation relative to native diameter is critical in assessing rupture risk
- Multidisciplinary coordination is essential
- Infection-conscious open reconstruction remains viable in medically fragile neonates
- Careful conduit sizing and meticulous anastomotic technique are paramount
- Early outcomes suggest durable reconstruction is achievable despite complex comorbidities
- Anticipate need for 2–3 staged future repairs for graft upsizing

Durable neonatal aortoiliac reconstruction is achievable in medically fragile infants.

