

# Intraoperative Management of an Acute Aortic Occlusion with Multiorgan Failure in an Adolescent Patient

Ailan Zhang, MD, PhD, Tara Doherty, DO

Department of Anesthesiology, Westchester Medical Center/New York Medical College, Valhalla, NY

## Introduction

- Aortic thrombosis:** carry high morbidity and mortality
  - Primary aortic thrombi: most are idiopathic
  - Secondary aortic thrombi: associated with underlying aortic aneurysms, dissections, and implanted graft materials
- Risk factors:** smoking, diabetes, hypertension, dyslipidemia, atrial fibrillation, and malignancy
- Disease presentation** abdominal pain with or without hematochezia, ischemic limb pain, claudication, paresthesia, skin discoloration or necrosis, dysarthria, paraplegia, but often can be asymptomatic

## Case Presentation

- Patient:** 15-year-old male presented with acute chest, back and abdominal pain with diminished sensory & motor function of his in lower extremities
- Past medical and surgical history:** none
- Imaging:** CTA revealed filling defects in the aorta at diaphragmatic hiatus, with absent blood flow to celiac trunk, superior mesenteric artery and bilateral renal arteries (**Figure 1 & Figure 2**)
- Plan:** exploratory laparotomy with aortic thrombectomy

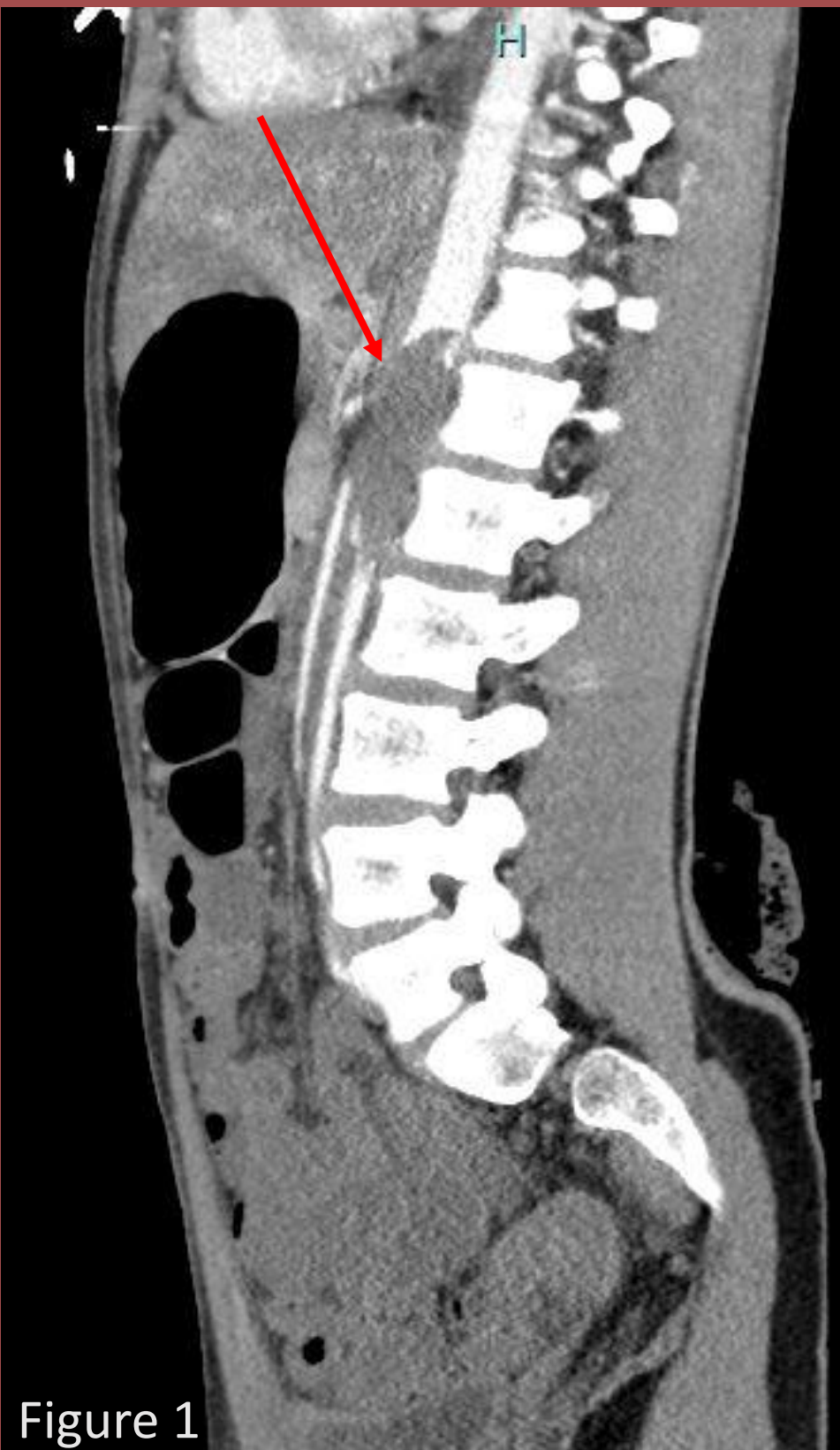


**Figure 1.** Abdominal CT scan sagittal view showed filling defect (red arrow) in abdominal aorta.  
**Figure 2.** Abdominal CT scan cross-section view showed filling defect (blue arrow) in abdominal aorta.

## Perioperative Management

### Pre-operative Evaluation

- Physical exam:** lethargic, pale, diaphoretic with mottled skin of lower body below the umbilicus. Diminished sensory and motor function in the lower extremities without palpable femoral or distal pulses
- Vitals:** BP 154/90 mmHg, HR 103 bpm, RR 31, SpO2 92 % on room air, Temp 36.7 °C
- Lab:** WBC 20.06 k/mm3, Hgb 10.4 g/L, creatinine 1.92 mg/dL, potassium 4.4 mEq/L

### Intra-operative Management

- Anesthesia: General anesthesia**
  - Pre-induction:** left radial arterial line placement
  - Induction: Rapid sequency induction:** midazolam, propofol, fentanyl, cisatracurium
  - Maintenance:** sevoflurane, fentanyl, cisatracurium
- Monitoring: standard ASA + invasive arterial, CVP & PPV**
- Intraoperative challenges**
  - ☐ **Shock: combination of hemodynamic swings from aortic clamping, massive hemorrhage, distributive shock and thrombus in left ventricle (Figure 4)**
    - Massive blood transfusion:** 22 units PRBC, 15 units of FFP, 7 units of platelets, and 20 units of cryoprecipitate
    - Coagulopathy:** ROTEM guided transfusion
    - Vasopressors:** norepinephrine, vasopressin, and epinephrine infusion
  - ☐ **Acute renal failure, severe metabolic acidosis, refractory hyperkalemia due to the massive abdominal aorta thrombus (Figure 3)**
    - Notable ABG:** pH 7.01 and potassium 6.8 mEq/L
    - Medical treatment:** insulin, sodium bicarbonate, calcium, and furosemide
    - Intraoperative continuous veno-venous hemodialysis (CVVHD)**

- POD1:** exploratory laparotomy revealed frank small and large bowel necrosis, no pulses detectable in the infra iliac aorta. Patient had multiorgan failure and died later that day.

## Intraoperative Surgical Specimen and Imaging

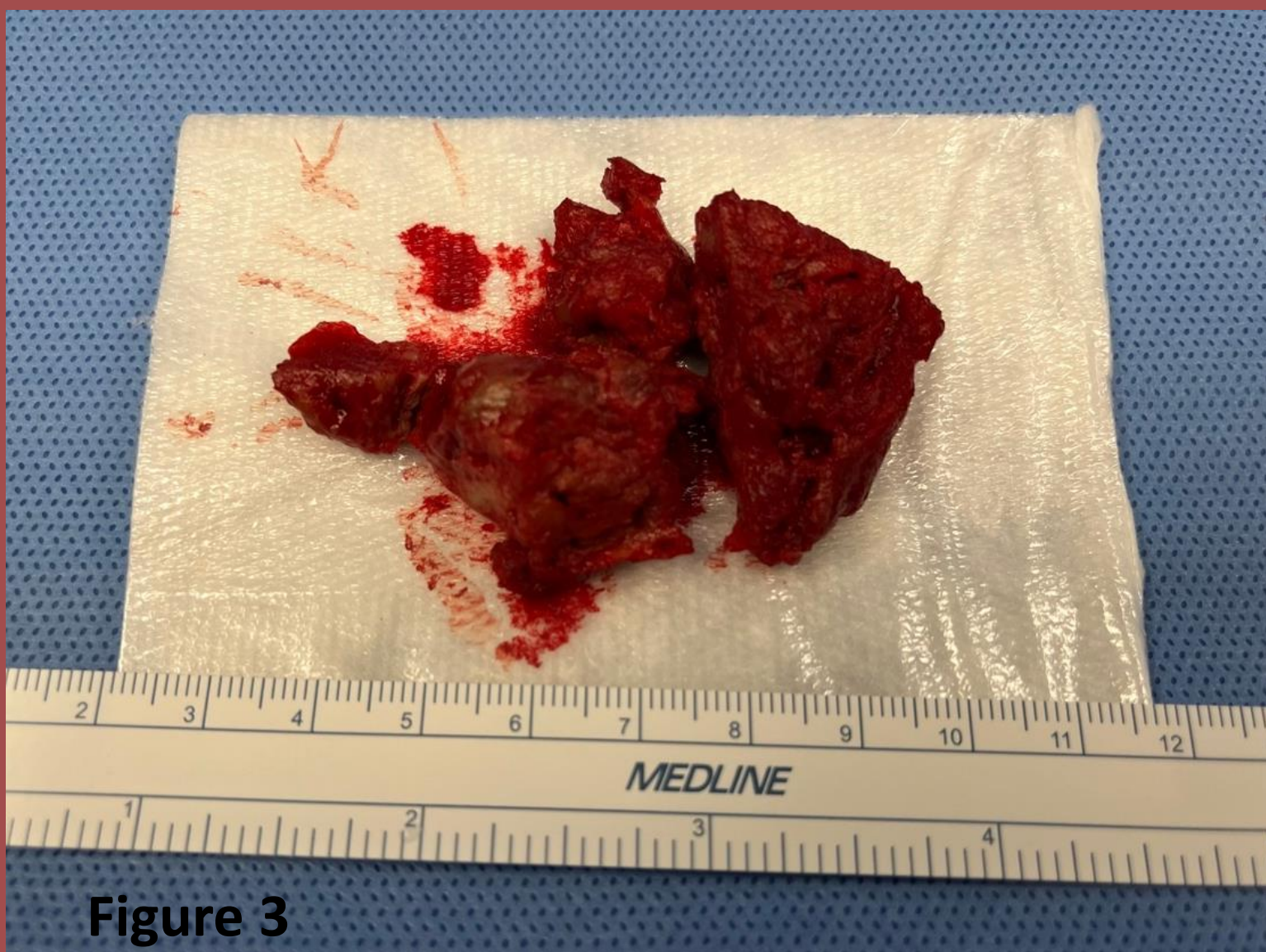


**Figure 3.** Intraoperative photography after excision showed aortic thrombus specimen.

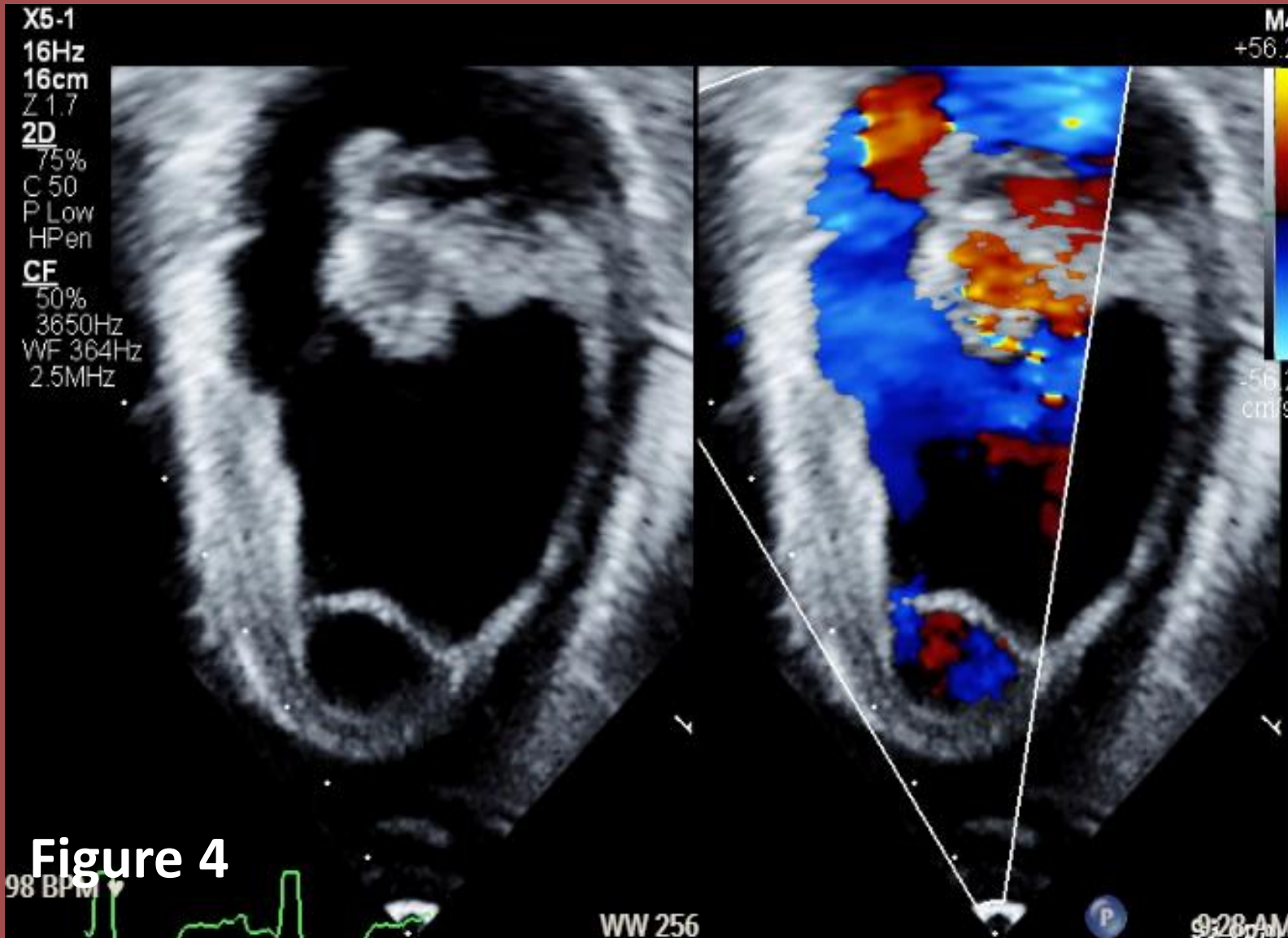


**Figure 4.** Intraoperative transthoracic echocardiogram apical-2 chamber view of left ventricle with hyperechoic structure.

## Discussions

- The etiology of his thrombus remains unclear due to emergent surgery without hematology consultation and workup. It was unclear the left ventricular thrombosis could be the source of the abdominal aortic thrombosis.
- Intraoperative CVVHD is a life-saving procedure often necessary in our most critically ill patients at risk for volume overload, severe electrolyte impairments and acid base fluctuations. The use of intra-operative CVVHD should be considered in settings where an elevated level of metabolic control is needed to improve patient outcomes.

## References

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