

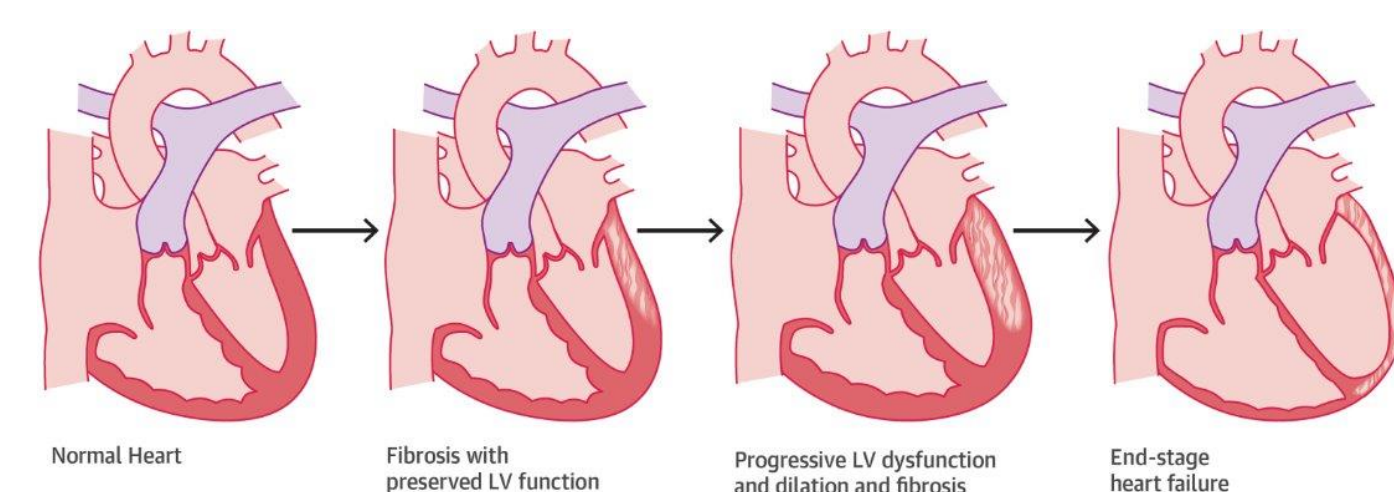
A challenging case of catheter ablation in a teen with Duchenne Muscular Dystrophy with refractory tachyarrhythmia on ECMO support

Steven Flamer, MD^a, Audrey Crane, MD^a, Jay Im, MD^{a,b}

a. Montefiore Medical Center, Department of Anesthesiology, Bronx, NY; b. Montefiore/Albert Einstein College of Medicine, Bronx, NY

Background: DMD Cardiac Manifestations

- Duchenne Muscular Dystrophy is an X-linked recessive mutation of dystrophin, a protein that helps maintain membrane stability
- Absent dystrophin → cells vulnerable to cell stress → necrosis of myocytes → replacement by fibrofatty tissue → dilated cardiomyopathy → arrhythmias, CHF¹
- Cardiac involvement not directly correlated with skeletal, respiratory disease severity¹
- Cardiomyopathy: 25% by age 6, 59% by age 10, 90% >age 18²
- Initially atrial arrhythmias: AF, AFL, AT
- Later can have ventricular arrhythmias with depressed LVEF

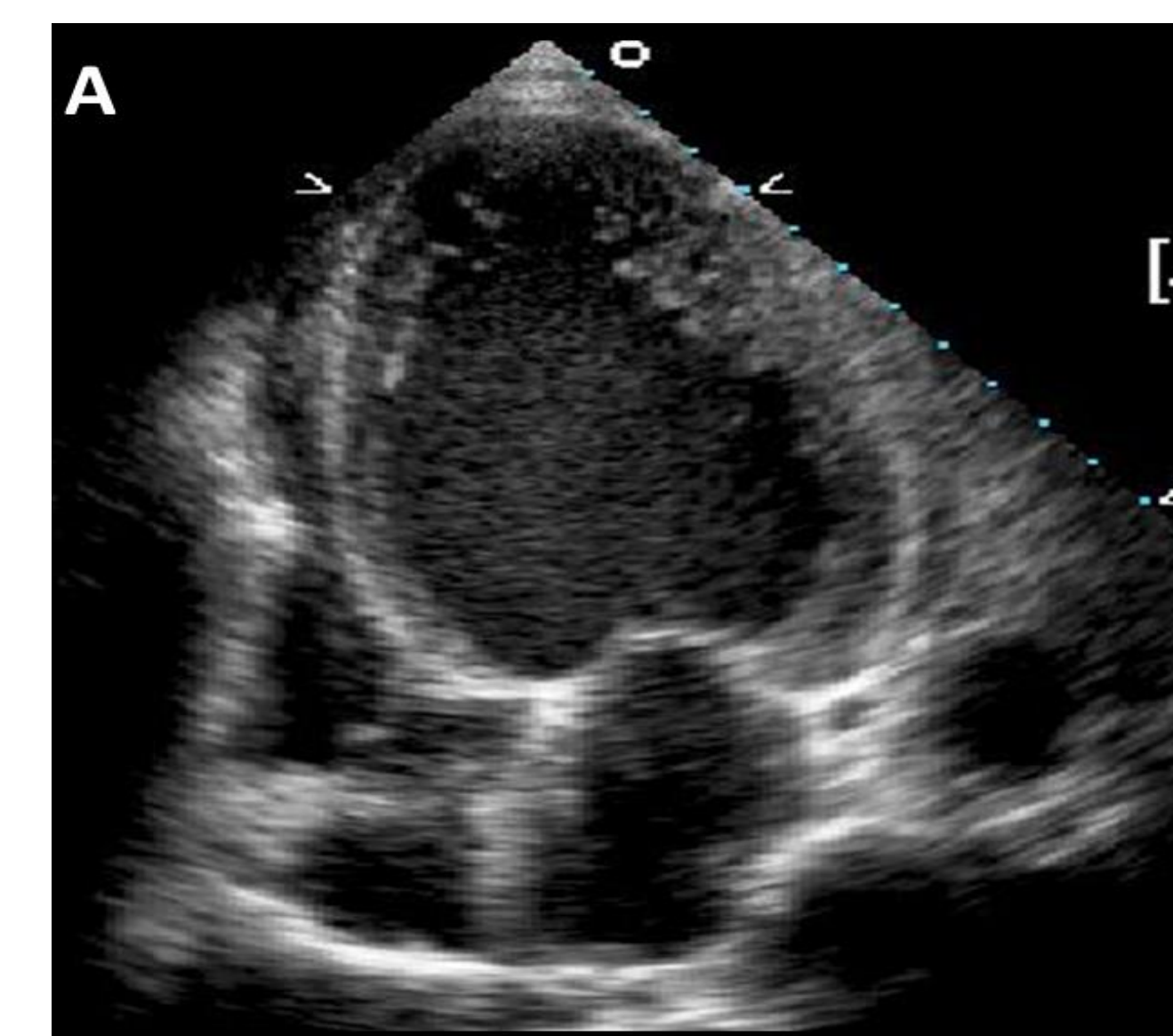
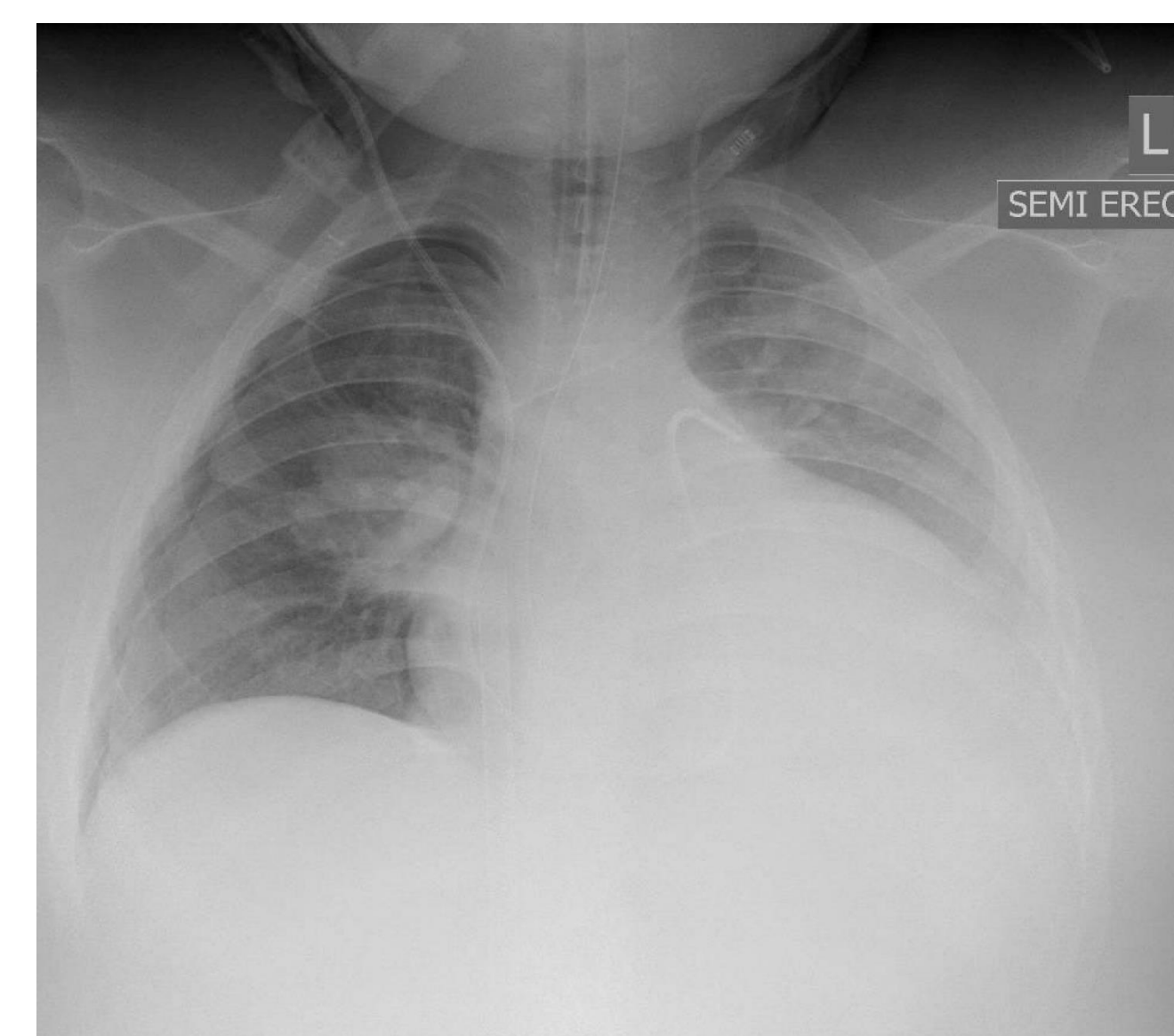


Background: Catheter Ablation on ECMO

- Limited case reports of catheter ablation while patient already on ECMO (occasionally ECMO concomitantly initiated for support during the ablation).³
- Of these cases, only a handful are in the pediatric population, primarily in infants^{4,5}
- Here we present a case of a 16-year-old on ECMO who was taken for catheter ablation

Case Presentation

- 16 y.o. M with DMD c/b dilated cardiomyopathy, HFrEF, recurrent atrial arrhythmias, asthma, OSA, obesity
- Admitted with atrial fibrillation/flutter with RVR and NSVT; started on IV antiarrhythmics
- HD#2: PEA arrest, initiated on femoral veno-arterial ECMO
- Unable to wean ECMO due to refractory arrhythmia
- Decision to pursue ablation while on ECMO with hope that rhythm control would optimize him for ECMO decannulation
- When catheter reached the RA, ECMO flows dropped to 1 lpm; improved to 4 lpm when catheter withdrawn back to IVC.
- Second attempt: after transseptal puncture, ECMO flows again dropped, causing hemodynamic instability resistant to multiple pressors, and the procedure was aborted.
- After catheter and sheath removal, patient had massive hemorrhage and coagulopathy, requiring MTP
- Over next month, he was medically managed, cardioverted, decannulated, and then had a successful ablation



Discussion: Unique Challenges of Ablation while on ECMO

- This is a rare case of attempted catheter ablation while on ECMO and highlights the challenges of proceeding with ablation while on preexisting ECMO.
- The ablation catheter competes for space with the ECMO cannulas, which can impede ECMO flows and cause hemodynamic instability and reduced CO.
- Multiple vasopressors may be insufficient to overcome this, and the procedure may need to be aborted.
- Since the patient remains on ECMO post-procedure, anticoagulation must be maintained, unlike the standard ablation when protamine reversal is administered.
- The anesthesiologist should be prepared for the need to manage hemorrhagic shock and coagulopathy after the femoral sheath is removed.

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