

Synergistic Solutions: Thrombectomy Facilitates Surgical Intervention in an Elderly Patient with Acute Pulmonary Embolism

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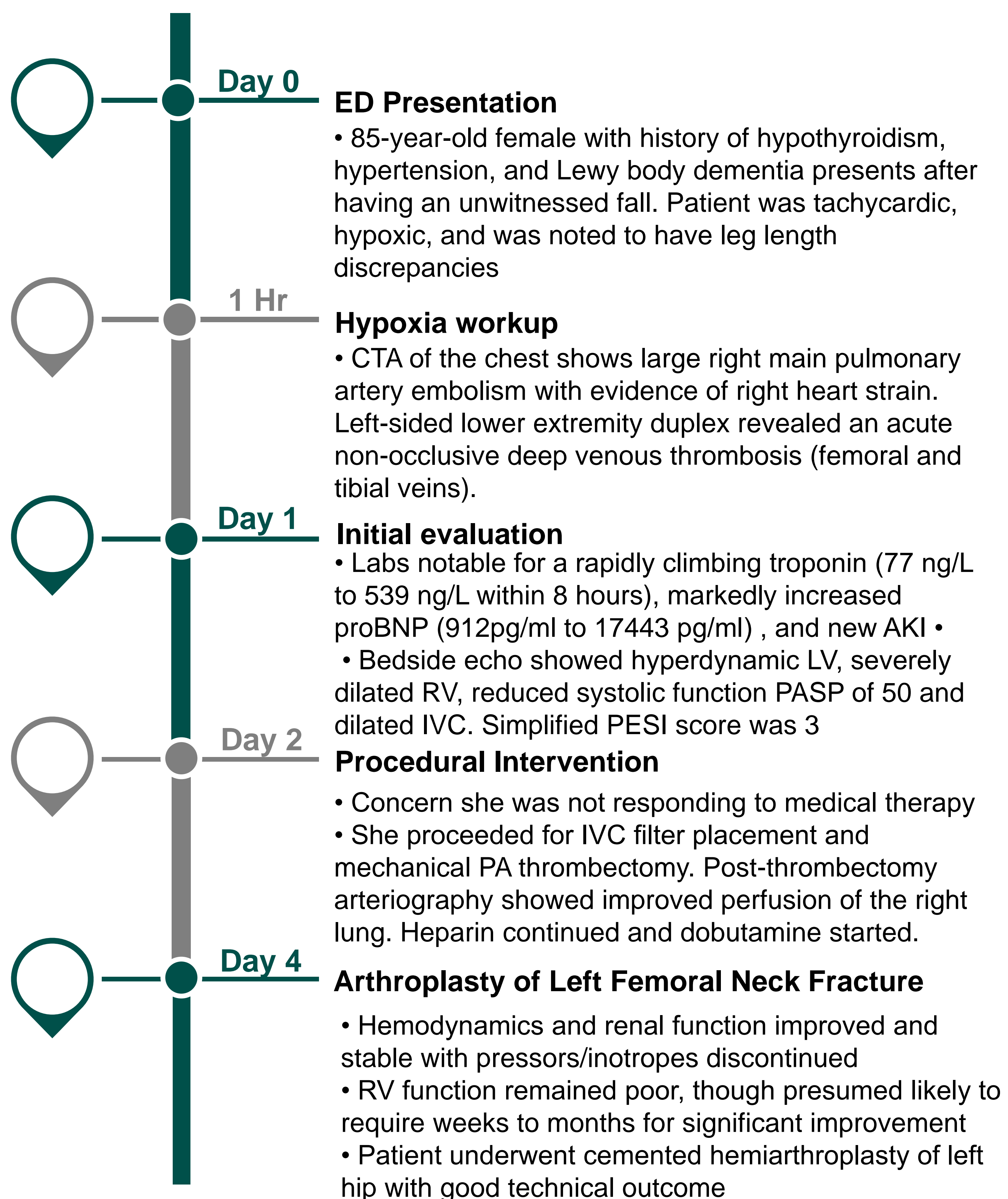
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Introduction

Highlights:

1. 85-year-old female with history of hypothyroidism, hypertension, and Lewy body dementia presents after having an unwitnessed fall
2. Tachycardic, hypoxic, and was noted to have leg length discrepancies
3. X-ray demonstrated a transverse left femoral neck fracture without dislocation
4. Patient subsequently found to have large right main PE resulting in hemodynamic instability, precluding surgical intervention of hip fracture
5. Simplified PESI Score of 3, suggesting intermediate- high risk for death (8.9%) from PE
6. PE addressed with thrombectomy with improved hemodynamics allowing for proceeding with hip arthroplasty, with technically successful results
7. Her perioperative mortality was estimated to be 26% and her 1-year mortality was estimated to be 25-30%
8. Patient demonstrated ongoing altered mental status after surgical intervention with poor PO intake and minimal mobility, resulting in ongoing functional decline
9. Decision was ultimately made by family to transition to comfort focused care and patient was discharged to home hospice on POD #10 from arthroplasty

Case Initial Timeline



Imaging

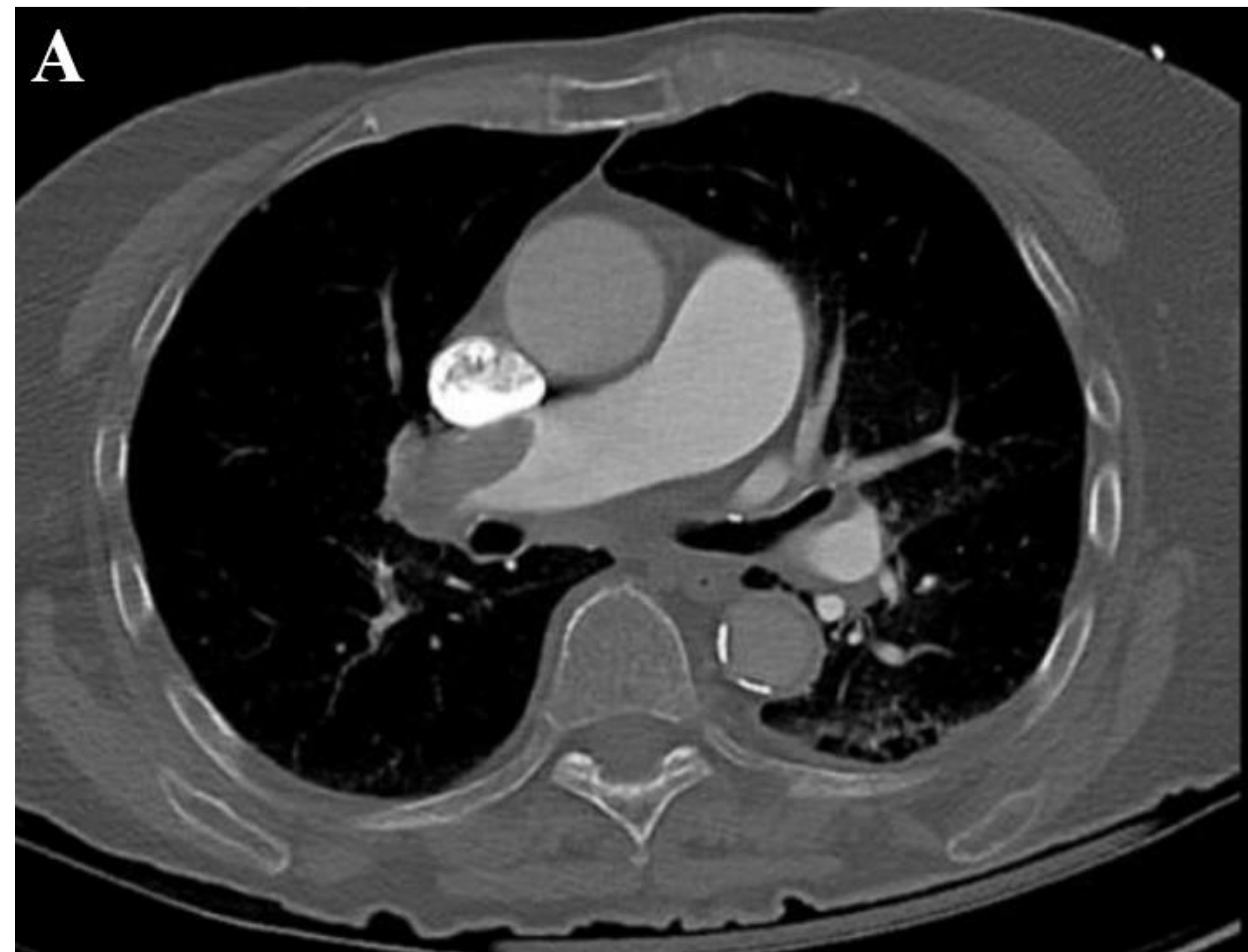


Figure A: CTA Chest

Large right main pulmonary artery embolus. Radiographic evidence of heart strain was noted

Figure B: Pre-thrombectomy:
Pulmonary arteriography with right femoral vein access demonstrating central right thrombus (as on above CT) and poor right lung perfusion along with well perfused right lung. PA pressure 25/5mmHg

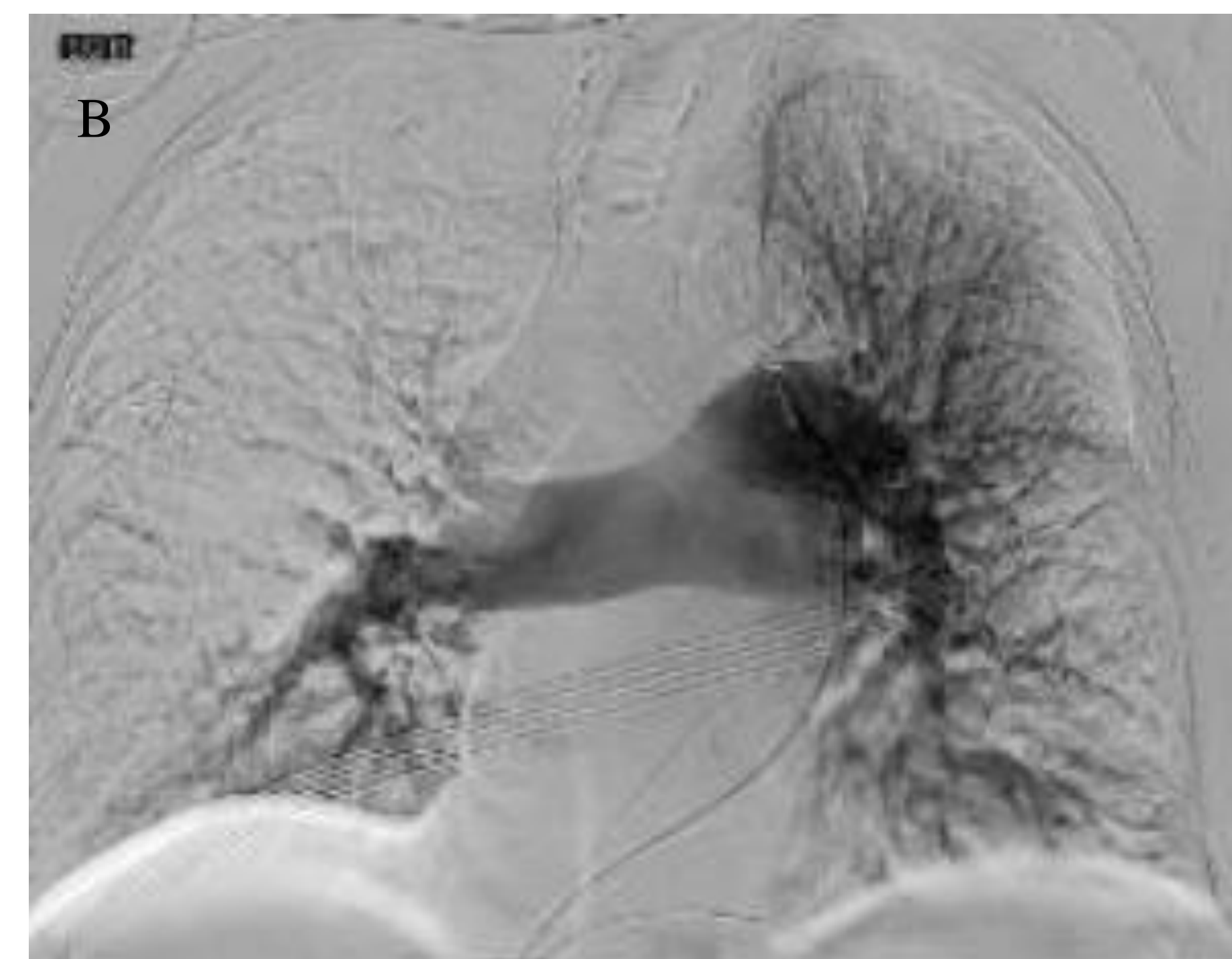
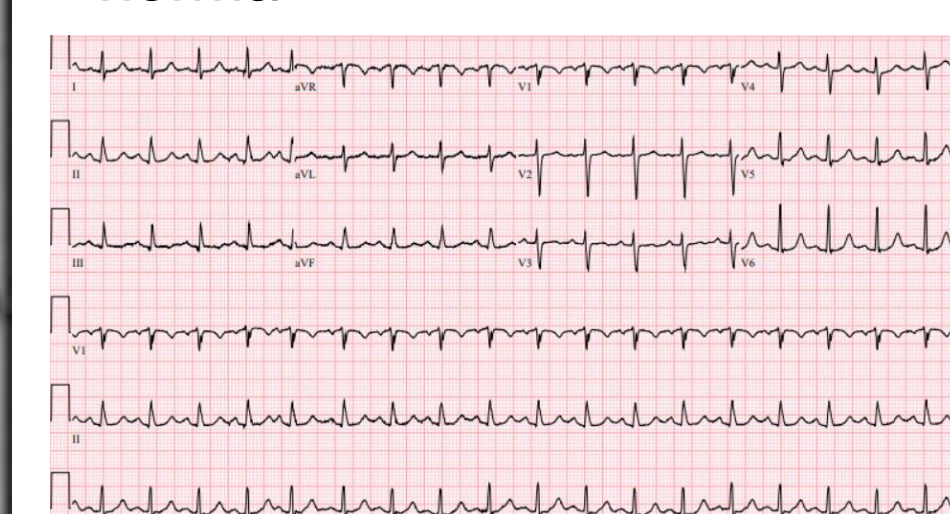


Figure C: Post-Thrombectomy:
Post-thrombectomy pulmonary arteriography no longer showing central right thrombus and somewhat improved perfusion of right lung.



Figure D: Presenting EKG

EKG at time of presentation. Note absence of T-wave inversion that can be seen in early precordial leads with RVS. Also absent class S1Q3T3 pattern. Notably, 18% of EKGs in patients with PE will be completely normal



Discussion

Background

• Pulmonary Embolism

- PE is the 3rd most common cause of vascular disease in the US
- Treatment intensity generally aligns with severity of hemodynamic burden
- However, no globally accepted risk-stratification scheme for severity
- Approximately 40% of patient present without notable hemodynamic insult
- Small number of patients present in high risk with cardiac arrest or shock
- The majority of patient present with intermediate risk PE
- Reported mortality ranges from 2.9% at 7 days to 14.5% at 90 days
- Measures of clot burden on CT have not correlated with mortality outcomes
- Biomarkers (troponin and Pro-BNP) provided evidence of necrosis or RVS
- Notably, ~10% of initially normotensive patients w/RC strain decompensate
- Clinical decompensation carries a mortality burden approaching 50%

• Therapeutic options include:

- Systemic Thrombolysis
 - Can result in rapid recanalization of pulmonary artery
 - Carries the most benefit if administer within 1-2 days of embolism
 - Role for ST in intermediate risk PE remains unclear, note 3% ICH risk
 - PEITHO trial showed similar 7-day mortality of 1.2 vs 1.8%
- Catheter-directed fibrinolysis
 - Improved safety profile vs systemic therapy
 - Minimal controlled investigation between CDF and ST
- Ultrasound-Assisted Catheter-Directed Thrombolysis
 - Notably, no analysis comparing USAT to CDF alone in PE
 - ULTIMA trial showed no difference vs heparin for RV/LV ratio at 90 days
- Mechanical Intervention, disruption and removal of thrombus
 - Favored in patients with hypotension and poor candidacy for ST
 - Additionally, several reports exist of worsening hemodynamic status

• What happened? Major learning points

- Patient underwent successful thrombectomy to facility arthroplasty
- Patient underwent technically successful arthroplasty
- However, after declining course, Palliative Care consulted
- Patient experienced a marked functional decline over past year from LBD
- Family felt QOL even prior to acute event was very suboptimal
- Ultimately family elected to pursue home hospice
- While procedures individually successful, ultimate outcome was poor
- Importance of shared decision making highlighted in this complex scenario
- Successful thrombectomy allowed for surgery that aligned with prior GOC

Conclusion

- This case of an 85 year-old female with progressive Lewy Body Dementia who presents after unwitnessed fall and is found to have large PE and hip fracture
- Hemodynamics precluded surgical intervention of hip and systemic thrombolysis thought very likely to cause fracture complication, so mechanical thrombectomy perused
- Perfusion returned with successful procedure, however RV function remained poor.
- Patient proceeded to arthroplasty despite high mortality risk
- She ultimately had technically successful arthroplasty but did not recover
- This highlights the importance of shared decision making in complex scenarios

1. Duzdzinski et al. Interventional Treatment of Pulmonary Embolism. Circulation: Cardiovascular Interventions. Volume 10, Number 2, 17 February 2017. <https://doi.org/10.1161/CIRCINTERVENTIONS.116.004801>
2. Bednarova, Helena & Orban, Marek & Nemecek, Petr. (2013). Postoperative left ventricular apical ballooning: Transient Takotsubo cardiomyopathy following orthotopic liver transplantation. The American journal of case reports. 14. 494-497. [10.12659/AJCR.889102](https://doi.org/10.12659/AJCR.889102)