

Severe Aortic Insufficiency and Cardiovascular Collapse from Type A Aortic Dissection with Dissection Flap Prolapse into Aortic Valve

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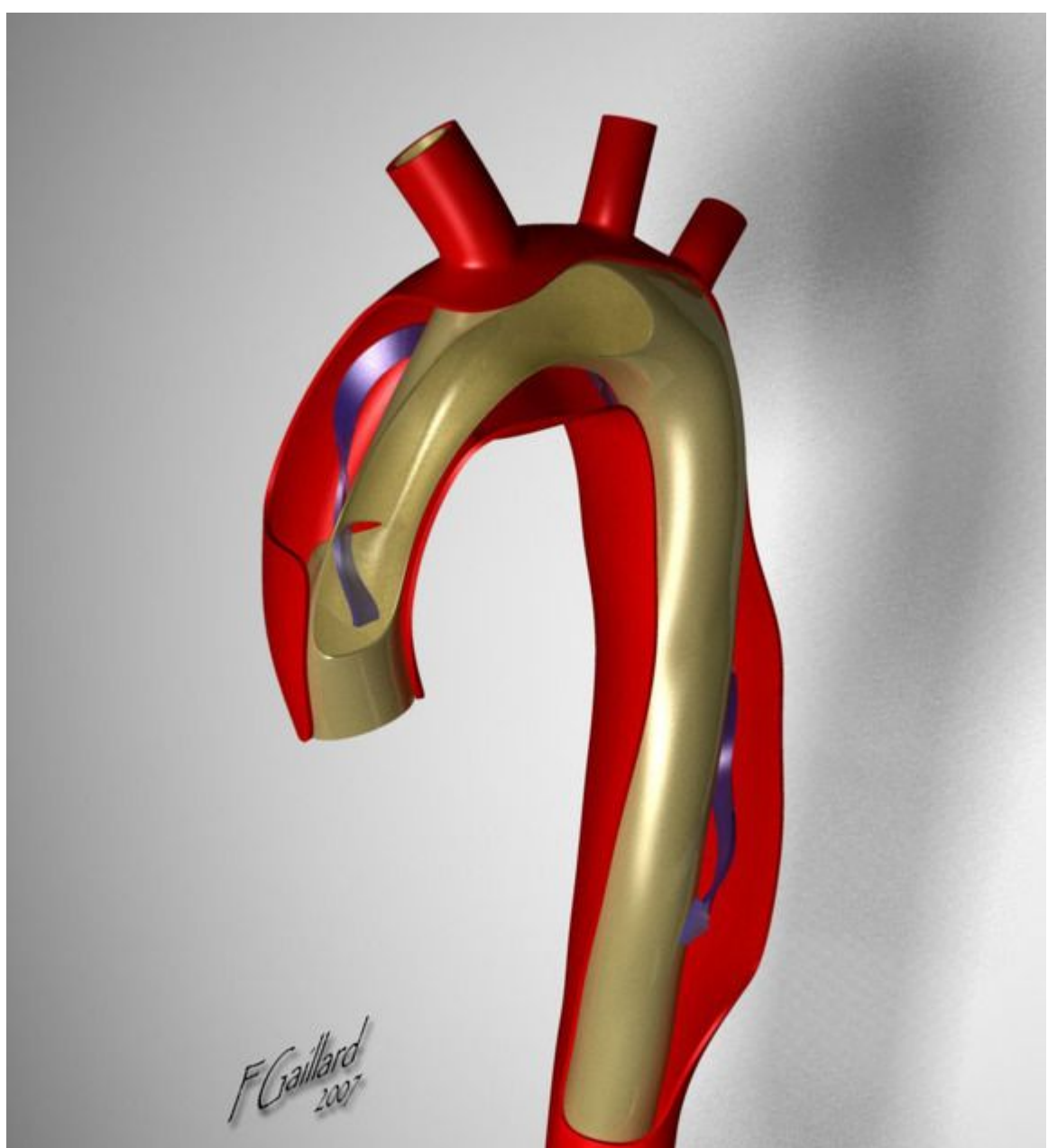
INTRODUCTION

Acute Type A aortic dissection is a surgical emergency with mortality increasing 1–2 percent for every hour of delay. While severe aortic insufficiency is a recognized complication, intimal flap prolapse into the aortic valve is a rare mechanism of abrupt hemodynamic collapse. Early recognition of malperfusion and rapidly deteriorating cardiac function is essential to guide intraoperative monitoring and management.

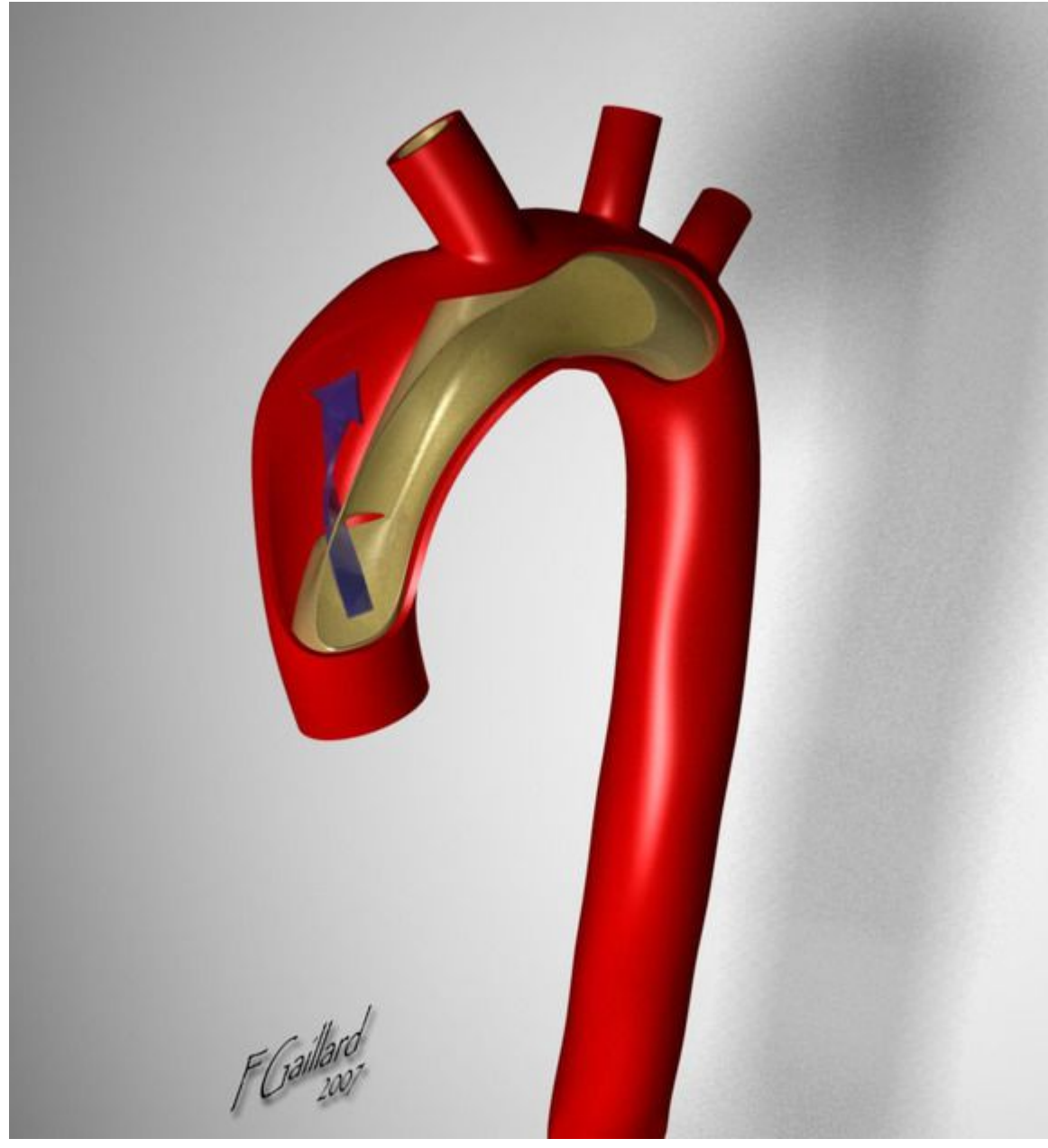
CASE PRESENTATION

- A 41-year-old man with obesity presented with slurred speech, left facial droop, and right shoulder pain.
- CT chest confirmed an acute Type A aortic dissection.
- In the OR, a right radial arterial line showed MAP ~50 mmHg, while the left arm cuff measured significantly higher, raising concern for regional malperfusion.
- A left femoral arterial line was placed for more accurate monitoring.
- Pre-bypass ABG revealed severe hyperkalemia with early myoglobinuria.
- Right cerebral oximetry signal was absent prior to cardiopulmonary bypass.
- TEE demonstrated an intimal flap prolapsing through the aortic valve, causing severe acute aortic insufficiency and biventricular failure.
- On pericardial entry, the right coronary artery was found completely avulsed from the aortic root.
- After repair, the patient was weaned from bypass on vasopressin, epinephrine, and norepinephrine.
- Postoperatively, he developed rhabdomyolysis, acute kidney injury, a right MCA stroke, deep vein thrombosis, and pulmonary embolism, eventually transferring to inpatient rehab with mild residual deficits.

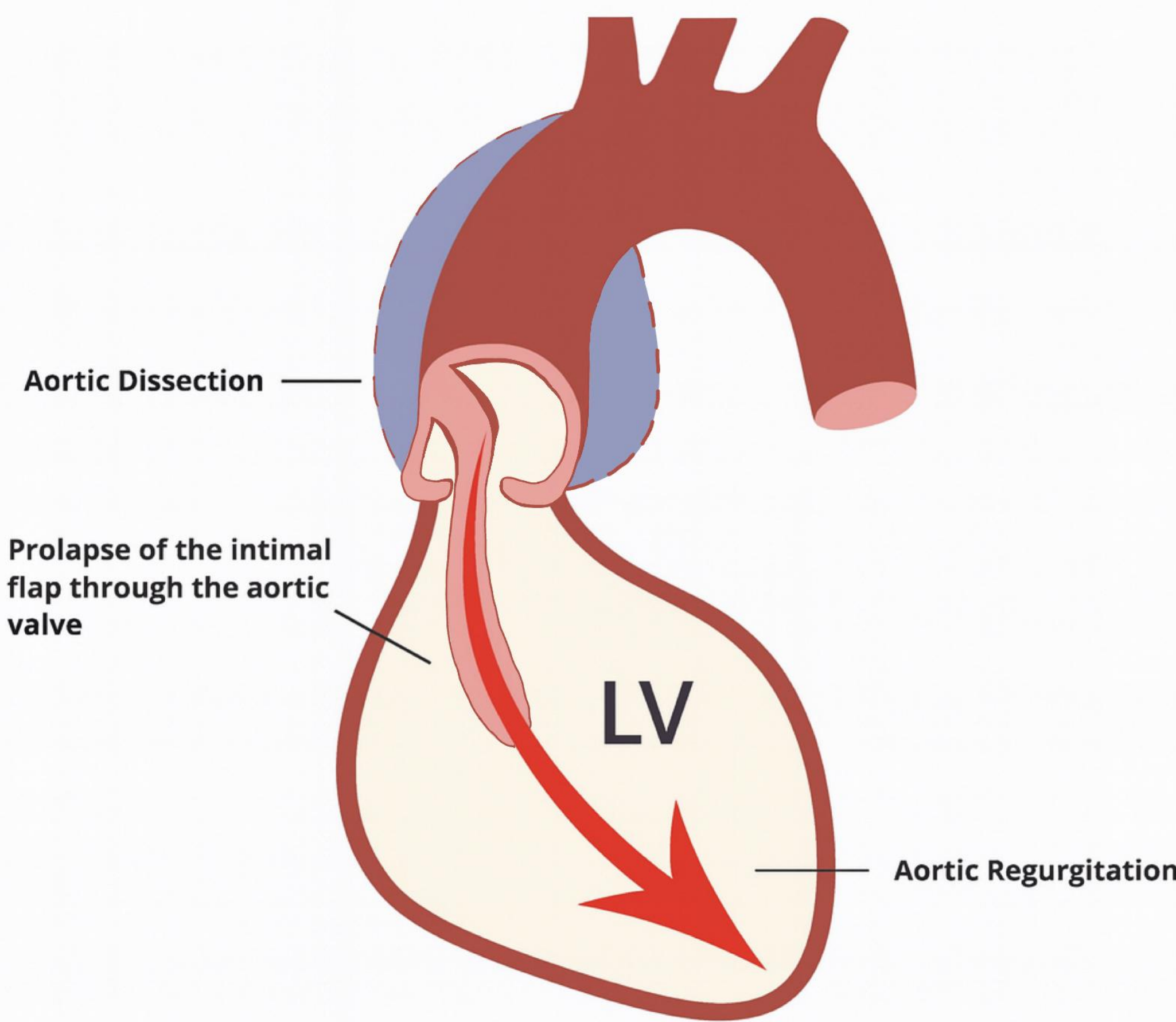
IMAGING



DeBakey Type I



DeBakey Type II



DISCUSSION

Flap prolapse into the aortic valve is uncommon but can cause immediate loss of forward flow and severe aortic insufficiency, leading to rapid biventricular collapse.

A pronounced blood pressure discrepancy between extremities should prompt evaluation for obstruction or malperfusion and consideration of femoral arterial monitoring.

The absent right cerebral oximetry signal indicated early cerebral hypoperfusion before bypass.

Hyperkalemia and myoglobinuria prior to CPB suggested rhabdomyolysis and systemic ischemia, indicating severe malperfusion before initiation of bypass.

The combination of flap-induced AI, RCA avulsion, and multisystem malperfusion contributed to the patient's complex postoperative course.

Vigilant monitoring, rapid diagnosis using TEE, and early initiation of vasopressor support are critical to stabilizing patients with complicated Type A dissections.

CONCLUSION

This case illustrates a rare and catastrophic presentation of Type A dissection involving flap prolapse into the aortic valve with RCA avulsion, resulting in acute hemodynamic collapse. Recognizing early signs such as pressure discrepancies, cerebral desaturation, and new severe aortic insufficiency is essential for timely intervention. Prompt surgical management combined with vigilant perioperative monitoring can significantly improve outcomes in these high-risk patients.

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