

Catheter based therapy as an option to high risk acute pulmonary embolism after coronary bypass graft, a Case Report

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Background

Acute pulmonary embolism APE is an unusual complication after coronary artery bypass graft CABG and is associated to higher morbi mortality. Early diagnosis is difficult cause symptoms are similar to postoperative manifestations including chest pain and shortness of breath. Mortality of APE after CABG is low but many cases reports and case series published are based on low and intermediate severity risk APE. There is no clear information and guidelines respect to high risk presentation cases, treatment in postoperative of CABG and systemic fibrinolysis is associated to major bleeding risk. Present case is a 54 years old male who present high risk APE on 15° day post CABG surgery.

Objective:

To present a case report of treatment a patient with high risk PE after CABG with contraindication to thrombolysis.

Methods

Our case involves a 54 years old male with medical history of hypertension and obesity. He underwent CABG after acute myocardial infarction with inferior ST segment elevation with early course of pulmonary edema. The operation and postoperative were complicated by severe cardiogenic shock and respiratory failure with severe hypoxaemia and pneumonia. On firsts 48 hours he was started aspirin plus heparin as prophylaxis of venous thrombotic events. On postoperative fifteenth day the patient was unstable hemodynamically in spite of left ventricle dysfunction and shock resolution. A cardiac POCUs finds RV strain, severe inferior cava dilation, hepatic veins reflux and left ventricle recovery of function. A CTA confirm massive APE. The patient underwent catheter based therapy FlowTriever system (Inari Medical, Irvine, CA, USA) 24, 20 and 16 Fr with mechanical thrombectomy left superior and inferior lobe arteries and segmental branches, main lobar inferior right artery, and right catheterism previous to aspiration show high circulatory pressure (Table 1).

Discussion

Pulmonary embolism is an unusual complication after CABG surgery and is related to worse prognosis. Incidence of APE after coronary bypass has been described in retrospective and prospective case series 0.8 - 1.5%. (3,4) and two original articles described mortality 0.49 - 7.6 % (3,4). Prompt diagnosis of pulmonary embolism in this cases is a challenge and frequently delayed cause symptoms and signs are present often during postoperative recovery. Case reports and literature review about APE after CABG are limited and there is no clear recommendation in therapeutic guidelines in high risk or intermediate high risk APE cases after CABG.

Heparin bridge and other anticoagulant therapies appear in many reports as option to patients with history of venous thrombotic episode. Viana et al found in 100 cases of CABG, 13% of APE but none with hemodynamic compromise (5), and segmental pulmonary arteries were the most frequent affected.

Catheter based thrombus suction are considered advanced therapies when there are systemic fibrinolysis contraindications (20% of major bleeding complications). Flow thriever is a manual mechanical aspiration technique using negative pressure devices inserted in femoral or internal jugular vein approved by FDA as therapeutic strategy in APE and in FLARE study it use was related to recovery of right ventricle dysfunction (6).

Conclusions

Acute pulmonary embolism is an unusual complication after CABG but when is present, it elevates three times mortality risk in this population. High risk APE cases and intermediate high risk could appear in spite of early use of VTE prophylaxis with heparin or low molecular weight heparin use after surgery. Mechanical aspiration with catheter based therapies as Flow Thriever, appeared as an option to systemic fibrinolysis when there is high risk of bleeding, and is associated to better clinical outcomes.

Table 1. Right catheterism and anatomical findings in pulmonary arteries.

RAP mmHg	RVSP/RVDP mmHg	PAPS/PADP mmHg	PAPm mmHG	POAP	RVP U Wood	GTP / GDP mmHg	Pulmonary artery compromise
11	72/11	72/ 35	45	20	4.5	25 / 15	Left segment superior and inferior branches occlusive lesions Proximal lobar inferior occlusive lesions

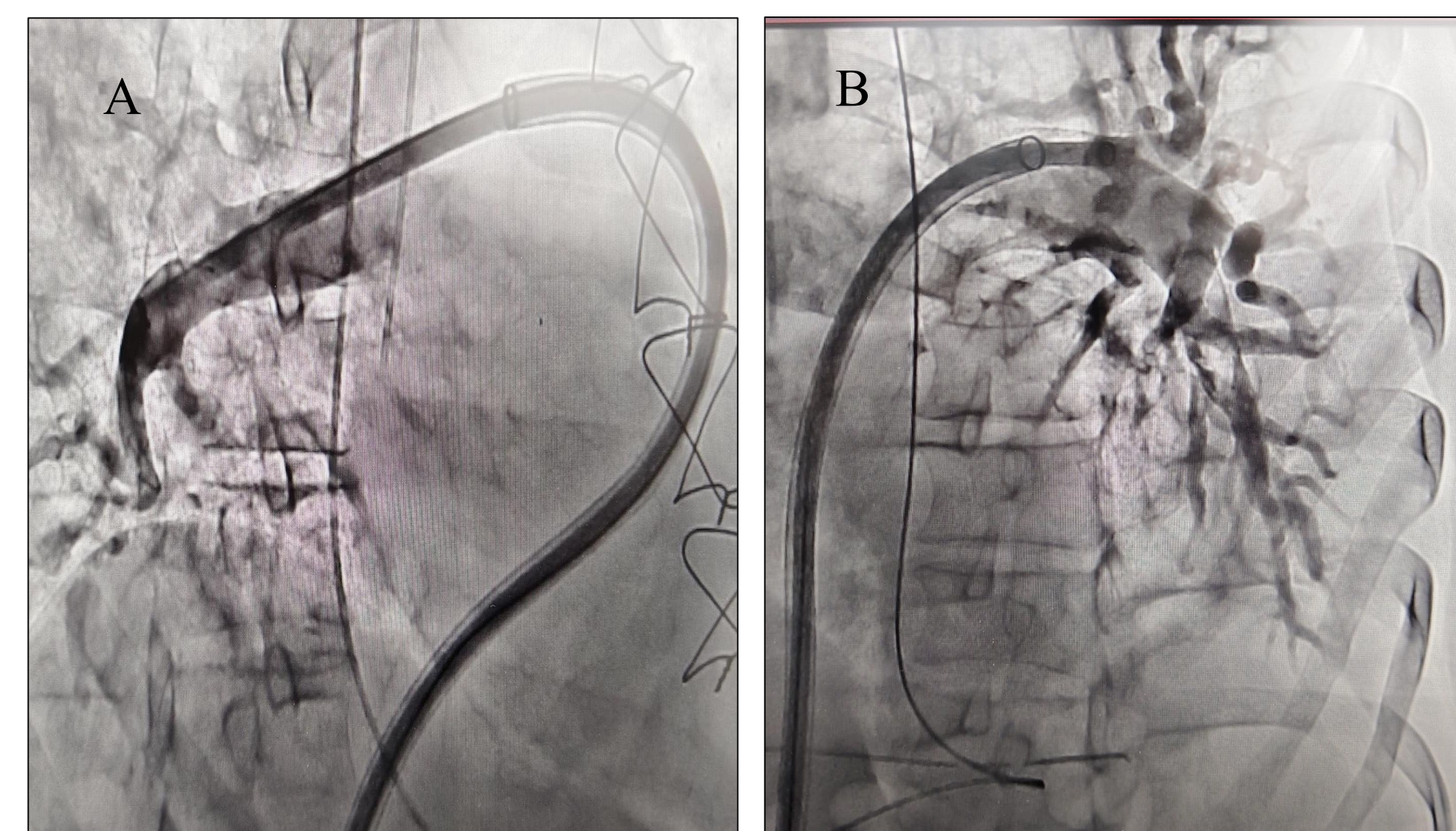


Figure 1. Flow Thriever aspiration technique in main pulmonary arteries. A. Right lobar. B. Left lobar.

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Conflict of interest

The authors declare the research was conducted in absence of commercial or financial relationship.