A case of acute massive pulmonary embolism treated by percutaneous mechanical thrombus aspiration

K T Sajeer¹, Vivek pillai¹, G V Vinod¹, R Sandeep¹
V Haridasan², G Rajesh³, M N Krishnan⁴

Abstract
Pulmonary embolism is a common disease process but can be difficult to diagnose. Massive pulmonary embolism presenting with profound hypotension, however, is rare. Traditionally those patients suffering hemodynamic compromise from acute pulmonary embolism are treated with intravenous or catheter-directed thrombolysis. When this is contraindicated surgical embolectomy or mechanical techniques via a right heart catheter are alternative options. The former is well established but the latter is less commonly utilised in clinical practice. We report a case of postoperative acute massive pulmonary embolism treated by percutaneous mechanical aspiration

Introduction
Pulmonary embolism (PE) is a common but under-diagnosed disease process with an estimated incidence of about 60–70 per 100 000 of the general population.¹ Massive PE, however, characterised by circulatory collapse is rare and as such randomised controlled trials (RCT) on its optimal management are lacking. Early mortality in patients with massive PE is at least 15%, but in patients with sub massive PE with RV dysfunction, it is 8%, and the degree of hemodynamic compromise is the most powerful predictor of in-hospital death.² Despite a lack of robust data British Thoracic Society (BTS) guidelines published in 2003 clearly recommend the use of thrombolysis in massive PE; the earlier the better.³ The BTS guidelines go on to state that if there are absolute contraindications to thrombolysis or in cases of failed thrombolysis surgical embolectomy or mechanical techniques via a right heart catheter should be considered.

Case report
A 47 year old female who had undergone abdominal hysterectomy, presented with history of sudden onset dyspnea and shock on the second post operative day. On examination, patient cyanosed, pulse rate was 110 beat/min, respiratory rate 50 /min, JVP mean elevated with prominent 'a' wave, BP 80/70mmHg, S1 loud, S2 split with loud P2, RV S3, systolic murmur at lower left sternal border. Her O2 saturation was 80% on room air. Lab investigation revealed normal CBC, altered RFT, LFT and electrolytes. TnI and CKMB were mildly elevated. ECG showed S1Q3 pattern and Chest X-ray showed Palla’s sign and Westermark’s sign (Figure.1) Echo showed oscillating thrombus in right pulmonary artery (figure.2), RV dysfunction with Mc Connell’s sign and severe tricuspid regurgitation. CT angiogram showed thrombus in right and left pulmonary arteries with extension to main pulmonary artery. As thrombolysis was contraindicated in view of recent surgery and patient’s clinical status deteriorating despite being on heparin infusion, an emergency mechanical thrombus aspiration was planned. Right heart catheterization done with 8F Judkin’s right guide catheter and entered in to main pulmonary artery. Her PA pressure (PAP) was 40/15 mmHg (mean 25 mmHg). Mechanical fragmentation of thrombus and subsequent aspiration done repeatedly and post aspiration PAP was 16/3 mmHg (mean 8 mmHg). Immediate Pulmonary angiogram showed normal MPA and RPA with occlusion of distal small lower lobe branches of left pulmonary artery.(Figure.3-4) Patient’s hemodynamic parameters improved, and follow up pulmonary angiogram showed normal pulmonary circulation.(Figure.5) The patient made a full recovery from the acute episode and was discharged on warfarin.

References:
1. Oger E: Incidence of venous thromboembolism in a population. (Figure.5) The patient made a full recovery from the acute episode and was discharged on warfarin.

1 Senior Resident, 2 Assistant Professor, 3 Additional Professor, 4 Professor & Head
Department of Cardiology, Government Medical College, Kozhikode, Kerala, India
full recovery from the acute episode and was discharged on warfarin.

**Conclusion**

Percutaneous mechanical aspiration of thrombus can be considered as a safe and effective method of treating massive pulmonary embolism when thrombolysis is relatively contraindicated and surgery not feasible.4-6 Interventional catheterization techniques7 for massive PE include mechanical fragmentation of thrombus with a standard pulmonary artery catheter, clot pulverization with a rotating basket catheter, percutaneous rheolytic thrombectomy,8 and pigtail rotational catheter embolectomy. Another approach is mechanical clot fragmentation and aspiration,9 which can be combined if necessary with pharmacologic thrombolysis. Pulmonary artery balloon dilation and stenting can also be considered. Successful catheter embolectomy rapidly restores normal blood pressure and decreases hypoxemia. Catheter techniques have been limited by poor maneuverability, mechanical hemolysis, macroembolization, and microembolization. In the future, further evaluation involving a larger cohort of subjects is necessary to determine whether this treatment is superior to surgical embolectomy when thrombolysis cannot be performed.

**References:**

1. Oger E: Incidence of venous thromboembolism in a

---

**Fig 4.**
Fragments of thrombi aspirated

**Fig 5.**
PA angiogram after thrombus aspiration

---