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Benefits of Achieving Robust Clot Resolution In VTE Patients While Balancing Lower Risk of Adverse Events

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The majority of VTE patients have traditionally been treated with anticoagulation alone. However, up to 50% of patients who present with lower extremity DVT develop post-thrombotic syndrome (PTS), despite being treated with anticoagulation therapy and compression therapy, while 35-50% of patients with PE who are treated with anticoagulation therapy go on to develop some form of functional limitation (Post PE syndrome).[1]

This has led to a quest to identify treatments that carry a much better risk-benefit ratio while reducing adverse event complications. Two interventional approaches have evolved: localized CDT, and mechanical thrombectomy. Beyond solving for the acute episode, the next challenge is how to achieve the greatest degree of clot burden reduction while optimizing perfusion and lowering adverse event risk.

While mechanical thrombectomy helps to reduce the risk of systemic bleeding, there are other risks related to the use of these devices that should be considered. There is a potential to damage to the vessel wall, damage to the valves, risk of hemolysis and the consequent damage to the kidneys. Prolonged aspiration can also lead to a high volume of blood loss, requiring blood transfusion.

A recent addition to the percutaneous devices is a catheter-directed thrombolysis device developed by Thrombolex. A good example of the effectiveness of this device is a recent patient I treated, who presented with a massive PE. He was a 79-year-old man, previously healthy, who presented in acute respiratory distress. The venography showed a massive saddle embolism and large bilateral pulmonary emboli and a 5.3:1 RV/LV ratio, (figure 5A&6).

The patient underwent thrombolysis using the Bashir Endovascular Catheter (BEC) (Figure 1). Boluses of 2.0 mg of r-tPA were injected into each pulmonary artery, followed by bilateral infusions at a rate of 0.65 mg/h, for a total dose of 14.0 mg. Follow-up, performed 16 hours after admission, revealed a decrease in pulmonary artery pressures to 43/12 mmHg (mean = 23), and a marked increase in the pulmonary arterial perfusion bilaterally compared to pre-procedure (figures 7 and 8A&B). The patient was discharged from the hospital 48 hours post procedure. A two-month follow-up showed resolution of all emboli (figure 5B).

This novel device provides us with rapid results that we have not found with any other catheter-directed device. There were no bleeding complications or adverse events of any kind related to this massive PE patient. Alternative devices I have used in the past have not been adequate for quick resolution of such a large thrombus burden. Using the BEC, we have been able to get results that we have been unable to achieve with other devices.

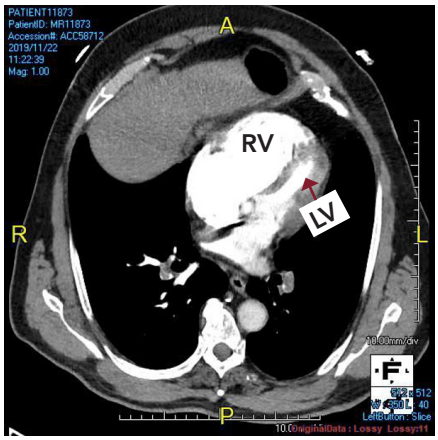
Figure 1. Bashir Endovascular Catheter (BEC)

A.

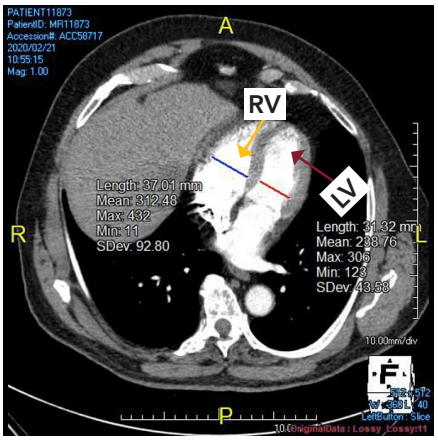
B.

C.

Figure 5. Pre- And Post-Procedural Thoracic Computed Tomographic Venography Cross-Sectional Views

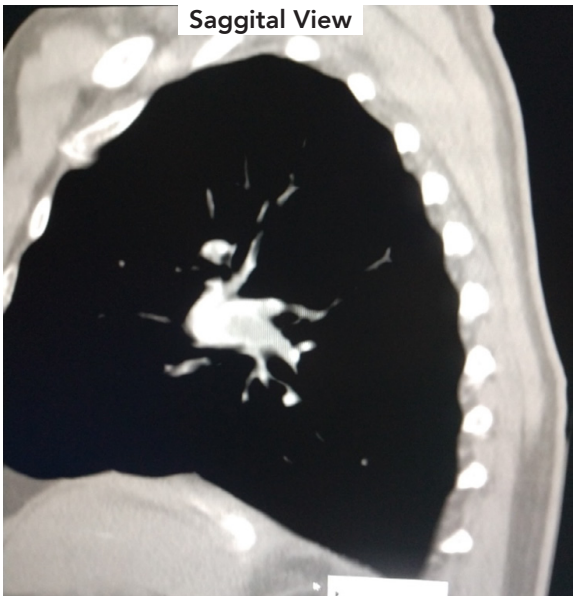


A. Initial presentation



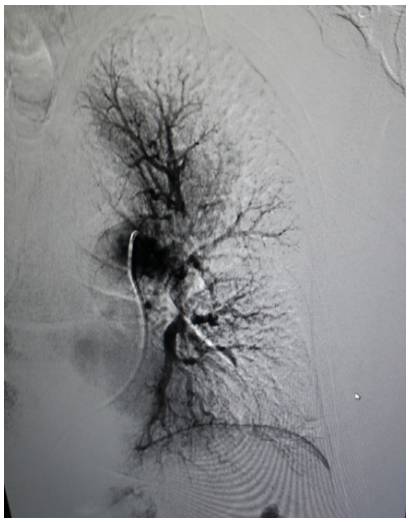
B. Two months post pharmaco-mechanical thrombolysis

Figure 6. Pre-Procedural Computed Tomographic Angiography

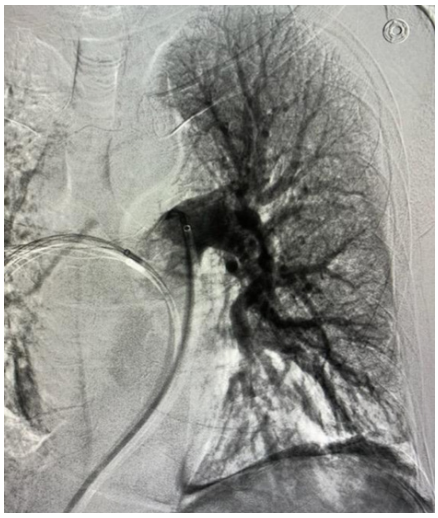


Marked Pulmonary Hypoperfusion

Figure 7. Left Pulmonary Angiography

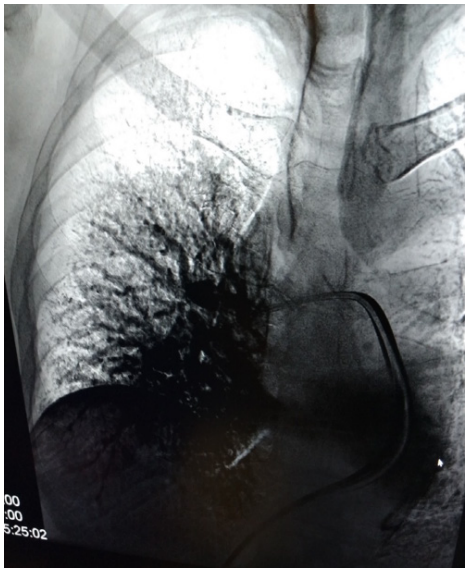


A. Pre-Procedure

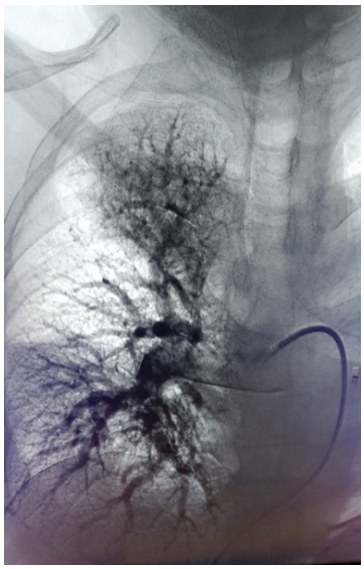


B. 16 Hours Post-Procedure

Figure 8. Right Pulmonary Angiography



A. Pre-Procedure



B. 16 Hours Post-Procedure

REFERENCES

1. Kahn SR, Hirsch A, Beddaoui M, et al. "Post-pulmonary embolism syndrome" after a first episode of PE: results of the E.L.O.P.E. study. Abstract #650. Presented at the 2015 ASH Annual Meeting, December 7, 2015; Orlando, Florida