CASE STUDY

EKOS™

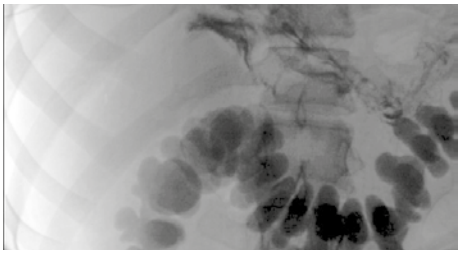
Thrombolysis of the Main Portal Vein with EKOS™

JASON SMITH, MD, Loma Linda Medical Center, Loma Linda, CA

Patient History

A 16-year-old male presented to emergency department with severe epigastric pain:

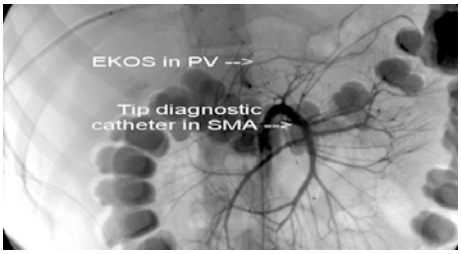
- Abdominal CT demonstrated complete thrombosis of portal vein (PV), splenic vein (SV) and superior mesenteric veins (SMV)
- Patient started on pain control and heparin drip, and was admitted
- A hypercoagulable work-up was instituted, and interventional radiology (IR) was consulted



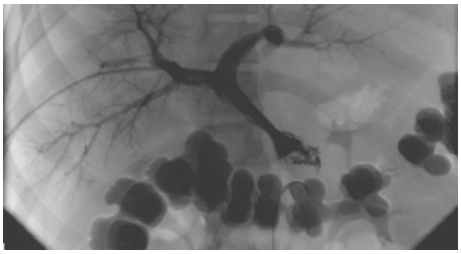
Initial portal venogram

Initial Endovascular Treatment

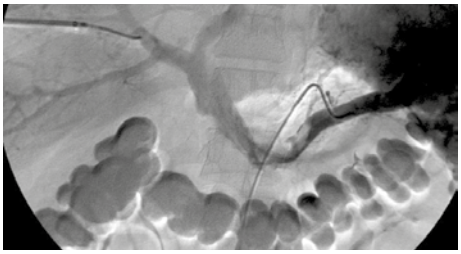
- Heparin drip was held, and patient brought to IR
- Percutaneous trans-hepatic access obtained with US guidance into right PV, and a vascular sheath placed. A device was manipulated into patent middle colic vein; venogram confirmed SMV and PV thrombosis
- 3000 units of heparin administered intravenously and mechanical thrombectomy performed with Angiojet (Possis) from peripheral to central several times
- EKOS™ (18 cm treatment length) device was placed across the SMV and main PV
- Through the right common femoral artery a diagnostic device placed with its tip in the superior mesenteric artery (SMA)
- 1mg/hour tPA infusions initiated in even split doses via EKOS™ and diagnostic devices
- 300 units/hour heparin infusions initiated in even split doses via sheaths



Initial EKOS™ placement



Recanalization at 21 hour follow-up



Splenic arterial portogram at 41 hours

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Results

Patient brought back 21 hours after EKOS™ placement:

- Recanalization of superior SMV and PV, but with residual scattered non-occlusive thrombus
- Balloon angioplasty performed of the SMA and main PV
- EKOS™ device repositioned into SV, which remained thrombosed
- tPA and heparin infusions were continued overnight at same doses/rates
- Patient continued treatment with EKOS™ overnight

Follow-up at 41 hours after EKOS™ placement:

- Patient had hematuria overnight not requiring transfusion
- Completion angiograms demonstrated approximately 90% reduction in clot burden in portomesenteric veins, with robust hepatopetal flow
- Trans-hepatic sheath was removed and hemostasis achieved by tract embolization, and hemostasis was achieved at the groin puncture site with a percutaneous closure device placement

Conclusion

- Lovenox therapy was begun. The patient's hematuria and pain resolved shortly thereafter
- Right upper quadrant Doppler ultrasound 4 days after completion of thrombolysis showed normal waveforms and widely patent hepatic, portal, and splenic vasculature
- Patient was discharged home later that day tolerating a normal diet and without pain

"EKOS™ was an integral component in the efficient and thorough treatment of challenging extensive portomesenteric thrombus with prompt restoration of normal antegrade flow."
– Jason Smith, MD

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