Direct Percutaneous Approach To Treat Visceral Artery Aneurysms Difficult To Approach Intraluminally: How To Do It Safely

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Disclosures
No disclosures for this talk.

Case 1
GDA/IPDA Bleeds/Aneurysms
Rx’d: Proximal and distal coils

Case 2
61 year old woman with Klippel-Trenaunay syndrome with numerous AV malformations and recurrent GI bleeding presents with symptomatic anemia

On presentation, patient has Hb/Hct of 3.8/12.9 and BP of 96/58

She receives 4U of PRBC and 1U cyro

Hospital Course

- After transfusion she remains hemodynamically stable with no evidence of GI bleeding
- On hospital day 7, her hemoglobin suddenly drops from 8.5 to 4.8 overnight
- CTA is ordered
Interval History

- Pt continues to receive transfusions and is having melena and continually dropping Hb
- 4 days following 1st embolization attempt, pt undergoes another CTA

Bleeding continues

- Patient is continuing to require frequent blood transfusions
- 4 days following the second embolization attempt, she is taken to the OR for proctosigmoidectomy to treat multiple AVMs and her retroperitoneal hematoma
- After evacuation of retroperitoneal hematoma and extensive search, surgery team is unable to locate source of the retroperitoneal bleeding
- 2 weeks following surgery, the patient is still requiring frequent blood transfusions, and IR is consulted again
Liquid Embolics

- Glue
- Onyx

Indications For Glue or Onyx

- Aneurysms
- Pseudoaneurysms
- Endoleaks
- Selective Cases of GI Bleeding
  - Coagulopathy, Difficult to reach, Variceal Bleeds
- AVM or AVF with Balloon control
- Venous
  - Pelvic congestion, Varicoceles
- Lymphatic

Why are Glue and Onyx Difficult?

- Special Preparation and Delivery
- Difficult to Control Once Injected
- Unique Complications

Glue

N-butyl cyanoacrylate (NBCA)

- Preparation
  - Polymerizes on contact with ionic agents- blood, saline, contrast
  - Does not Polymerize with D5W (Dextrose) or Lipiodol
- Therefore
  - Change gloves
  - Prepare using a clean side table with no contrast, saline or blood
  - More Lipiodol= Longer to Polymerize
  - Glue/Lipiodol 1/2 hardens quicker than 1/4
Glue
N-butyl cyanoacrylate (NBCA)
• Delivery
  – Microcatheter prepped with D5W
  – Glue/Lipiodol injected as a column, drops, pushed with D5W
• Pitfalls
  – Non target Embolization (especially when very diluted with Lipiodol)
  – Catheter can clog
  – Catheter can get stuck in the Glue (Less dilute, reflux…)

Onyx
Ethylene-Vinyl Alcohol Copolymer (EVOH)
• EVOH mixed with DMSO and Tantalum Powder (Radiopacity)
• Onyx 18 (6% EVOH), Onyx 34 (8% EVOH)
• Mix for 20 minutes before use
• DMSO compatible catheter
• Prep microcatheter with DMSO
• Inject Onyx slowly
• Precipitates on contact with blood and solidifies (outside-in) 10 min
• Cohesive not adhesive
Technique

- Failed endovascular embolization
- Pseudoaneurysm identified by imaging study
  - CT, MR, US, Angiography
- Percutaneous puncture with a 21 Gauge Trocar needle guided by
  - CT, Cone beam CT, US, Fluoroscopic Landmarks
- Embolize with Coils or Liquid under Fluoroscopic Control

The patient tolerated the procedure well with no post-procedural complications.

Following the percutaneous embolization of her bleeding pseudoaneurysm, the patient remained stable without signs of active bleeding.

12 days following the procedure, the patient was discharged to subacute rehab with close hematologic follow-up.
– 65 y/o M
– Multiple HCCs
– Dropping Hct
– CT scan performed
28 Y.O with Post Partum Hemorrhage
2 Weeks s/p Normal vaginal delivery
28 Y.O with Post Partum Hemorrhage
2 Weeks s/p Normal vaginal delivery

Pelvic Angiogram

Bilateral Uterine artery Angio:
No obvious AVM

R Ovarian artery Angio

Bilateral Uterine artery Angio:
No obvious AVM

R Ovarian artery Angio
Hypervascularity of R UA, ?AVM
Rx: UAE with particles/Gelfoam/Liquid vs Direct Puncture
Go Direct! Ultrasound Guided Puncture of Uterine Arteriovenous Fistulas for Obliteration with Ethylene Vinyl Alcohol Copolymer In Women with Life Threatening Hemorrhage

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3/25/2019

Conclusions
- Routine Trans-arterial Embolization does not always work
- Alternative Techniques should be considered
- Percutaneous Embolization using any means of imaging should be considered
- 21 Gauge Trocar needles can be safely used even if vital structures will be traversed
- Onyx, Thrombin, Glue or Microcoils can be injected directly using the Trocar needle
Which of the following is least useful to guide and treat visceral artery pseudoaneurysms percutaneously:

1. Conventional CT
2. Cone Beam CT
3. US
4. Fluoroscopy

Answer: Conventional CT- Embolization can not be monitored, other choices can be used to guide the needle and monitor the embolization.

Conclusions

Difficult to reach PSA

- Consider Percutaneous Approach
  - 21 Gauge Needle
  - Use US, CT, Cone Beam CT
  - Use Coils and/or Liquid Embolics
  - Always be aware of where the liquid embolic can potentially travel prior to injection
  - Consider Percutaneous Approach even in cases where intraarterial may be possible- It may be quicker and easier

Conclusions

Difficult to reach PSA

- Use Glue or Onyx
  - Learning curve
  - Can accomplish what other embolic agents can’t
  - Always be aware of where the liquid embolic can potentially travel prior to injection
  - Percutaneous Embolization/Occlusion of PSA can be accomplished without the need for Angiography Using Cone Beam CT and/or US