



13th International Symposium
on Endovascular Therapeutics

Liquid embolic agents and visceral aneurysm: an update

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Disclosure

- Consulting an Proctoring services
COOK

Liquid embolic agents

- Liquid agents are being used more and more for different embolization requires.
- High embolic efficiency and good clinical results.
- The learning curve is high, management and technical aspects are different and more complex than using conventional coils, plugs or particles.

Liquid embolic agents

- Can be classified into two main groups
 - Cyanoacrylate (glue)
 - Non-adhesive DMSO-based embolic
 - Onyx[®], Squid[®] are based on ethylene-vinyl-alcohol-copolymer-EVOH
 - Easyx[®] PHIL[®] are based on iodinated copolymer

Characteristiques Cyanoacrylate- glue

- On contact with ionic mediums (water, blood) , rapidly polymerize. It is necessary to flush the catheter with dextrosa before injection.
- Combined ethiodized oil (Lipiodol®), prolongs polymerization time, opacifies the liquid agent, and allows visualization under fluoroscopy.
- For most peripheral applications, a ratio between 3:1 to 6:1 ethiodol to glue.

Cyanoacrylate- glue

- N-butyl cyanoacrylate
 - Gluebran 2[®] , Histoacryl[®]
- N-hexil-cyanoacrylate
 - Purefill[®] , Magic Glue[®]

New features of this new generation of cyanoacrylate glue seems to reflect delayed polymerization for better control and less adhesion to the microcatheter.

DMSO (dimethyl sulfoxide)

- The toxicity of the DMSO solvent should be taken into account
- DMSO used to fill the catheter dead space.
- May cause vasospasm reaction in the event of massive quick injection and a risk of endothelial necrosis.
- Require adequate sedation.
- DMSO can dissolve some plastics, compatible microcatheter are necessary.
- Artefacts in CT can be relevant for follow-up

Non-adhesive DMSO-based embolics

- Onyx[®], Squid[®] are based on ethylene-vinyl-alcohol-copolymer-EVOH
 - Tamtalum powder to get radio-opacity.
 - » Shaking the product before use
 - » Be careful with superficial embolization, permanent tattoo.
 - » Depend of formulation high radio-opacity and high artefacts in F.U.
- Easyx[®] PHIL[®] are based on iodinated copolymer
 - Intrinsically radio-opacity (No tamtalum powder)
 - » More easy to prepare.
 - » No risk of tattoo.
 - » Sufficient radio-opacity without artefact in the F.U.

Principal characteristics liquid agents

	Risk Catheter entrapment	Difficulty to prepare	Visualization on fluoro	Catheter clogging	Artefacts on CT follow up
	↓	↓	↓	↓	↓
DMSO based with tamtalum	+++	++++	++++	+++	++++
DMSO based No tamtalum	+	++	++	+	+
No DMSO Glue	+++++	++	++++	+++++	+++
No DMSO NG of Glue	++++	++	++++	++++	+++

Visceral aneurysm: Endovascular repair

- Preservation parent artery

Liquid embolic are designed to provide complete filling and distal penetration of vascular lesions

Stent Graft:

- Good accessibility
- Proximal and distal sealing neck.
- Vessel > 5mm

Liquid embolic no indication as first option

Coiling & balloon or stent assisted:

- No too big aneurysm
- Accessibility

- Sacrifice parent artery

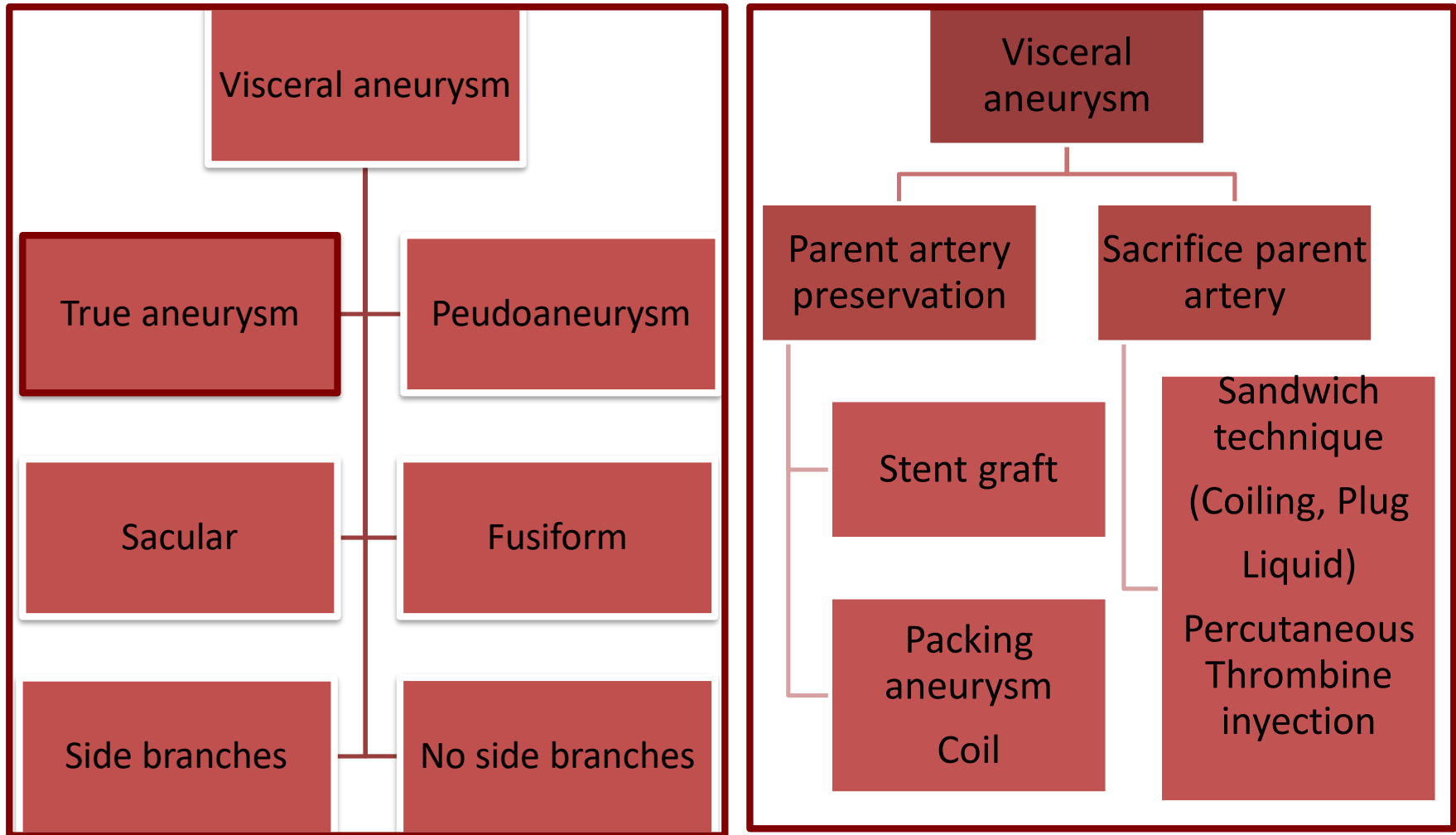
Sandwich technique

Occlusion of the vessel

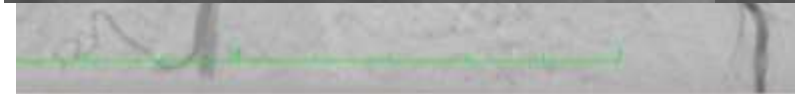
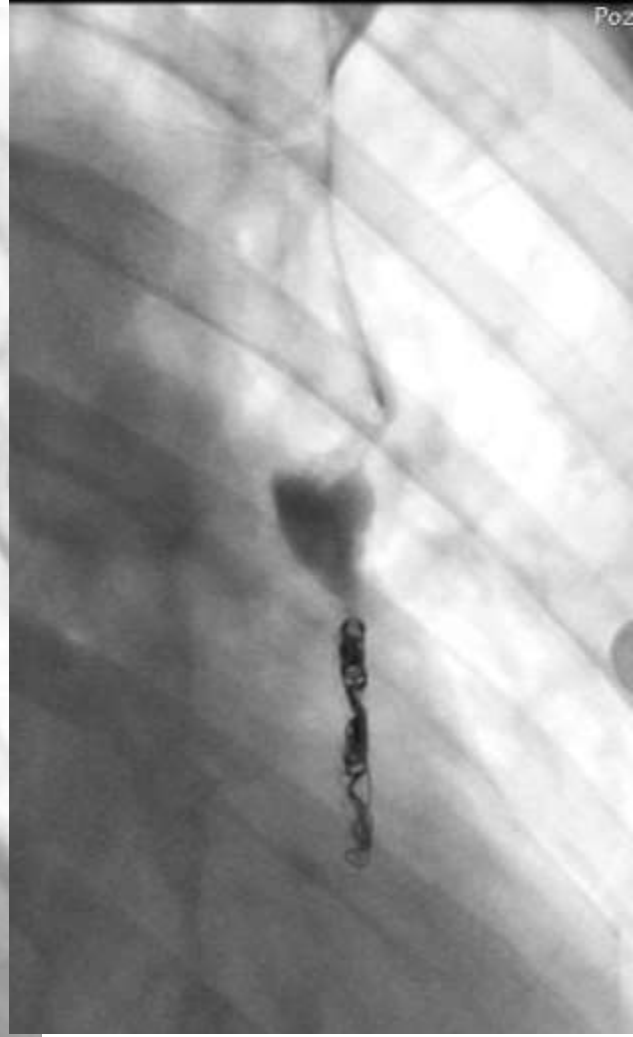
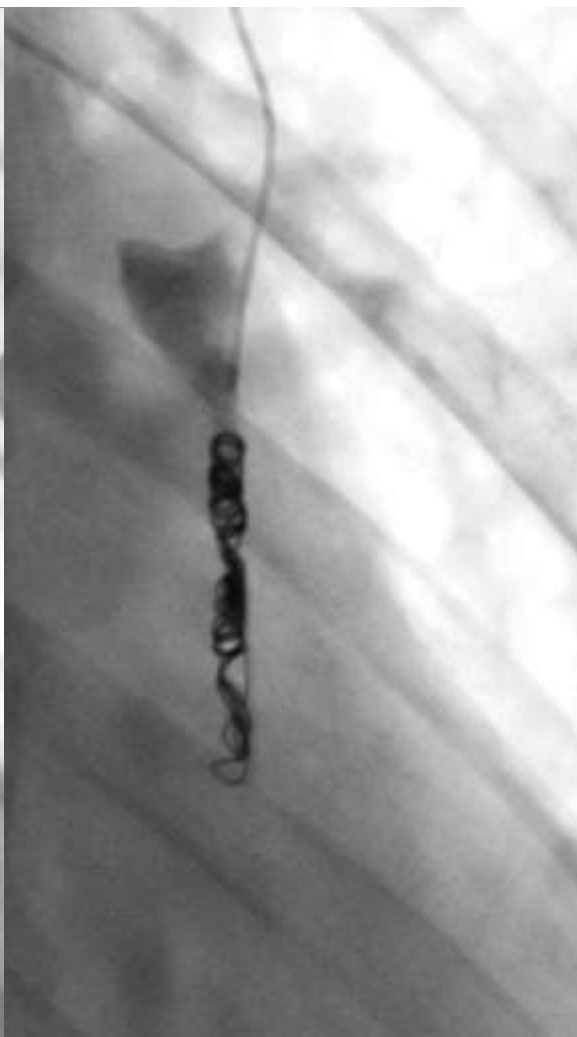
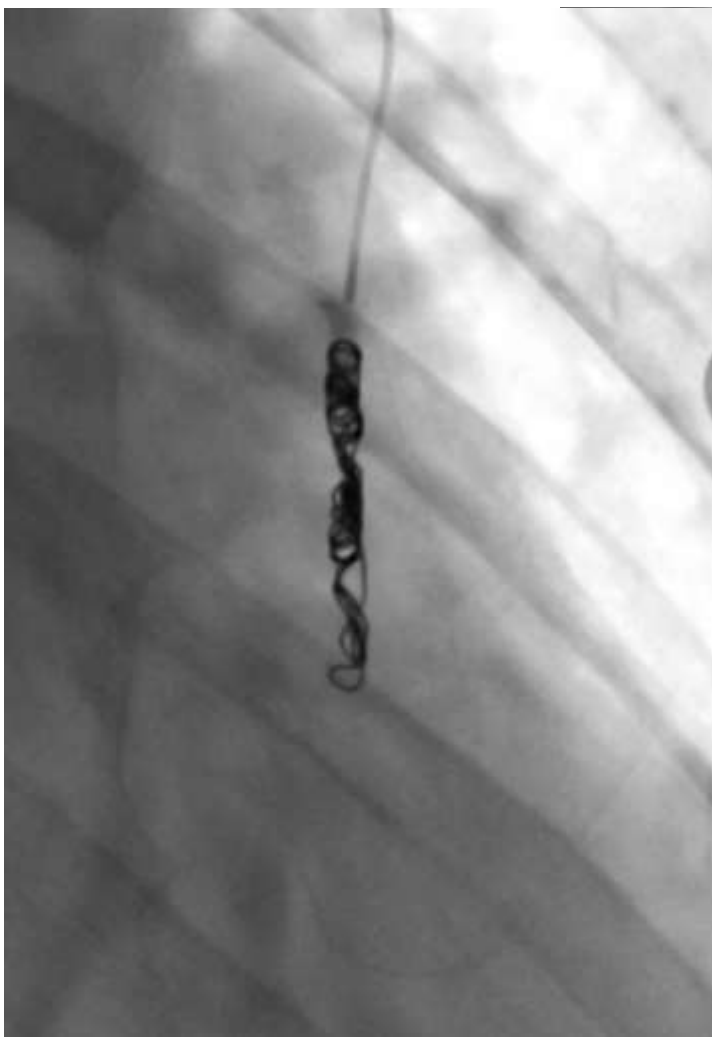
(Trapping back door/front door)

Coil, Plug, Liquid

Before intervention: Planning

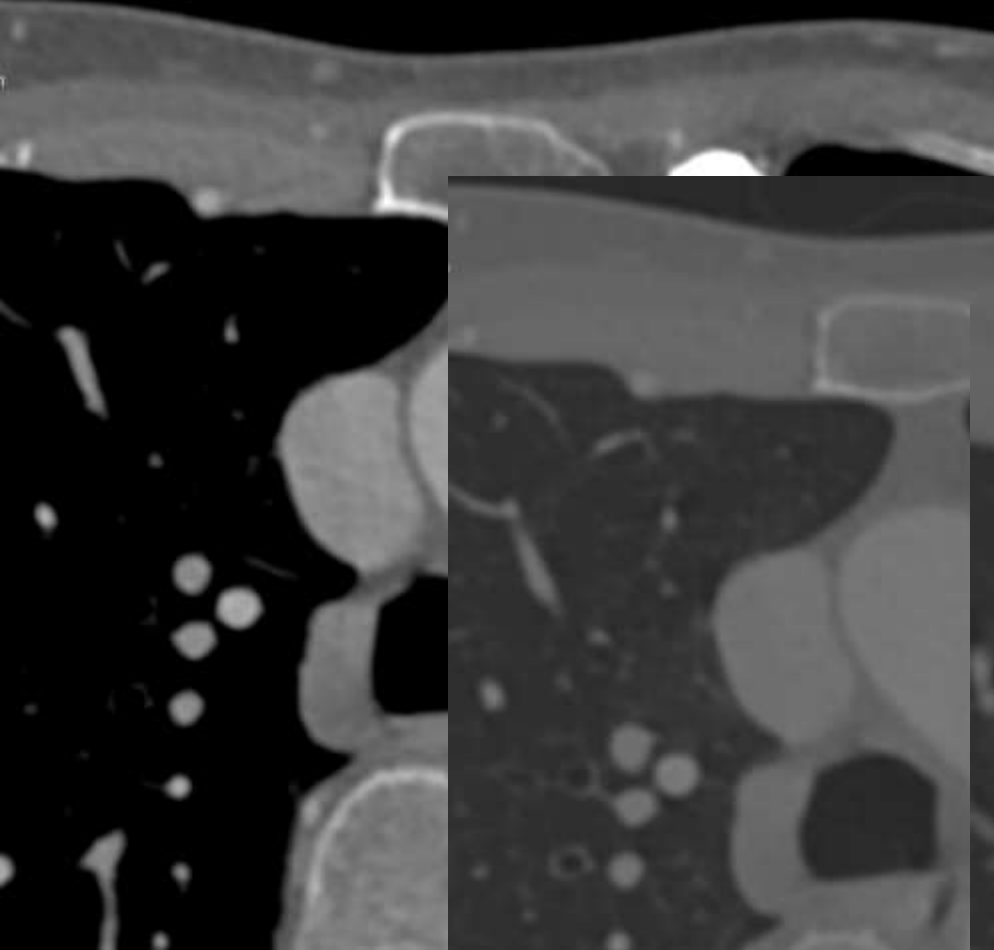


- Hepatic artery aneurysm arising from MSA
The planning on CT was close the
artery (hepatic artery
aneurysm) and
treated with a graft



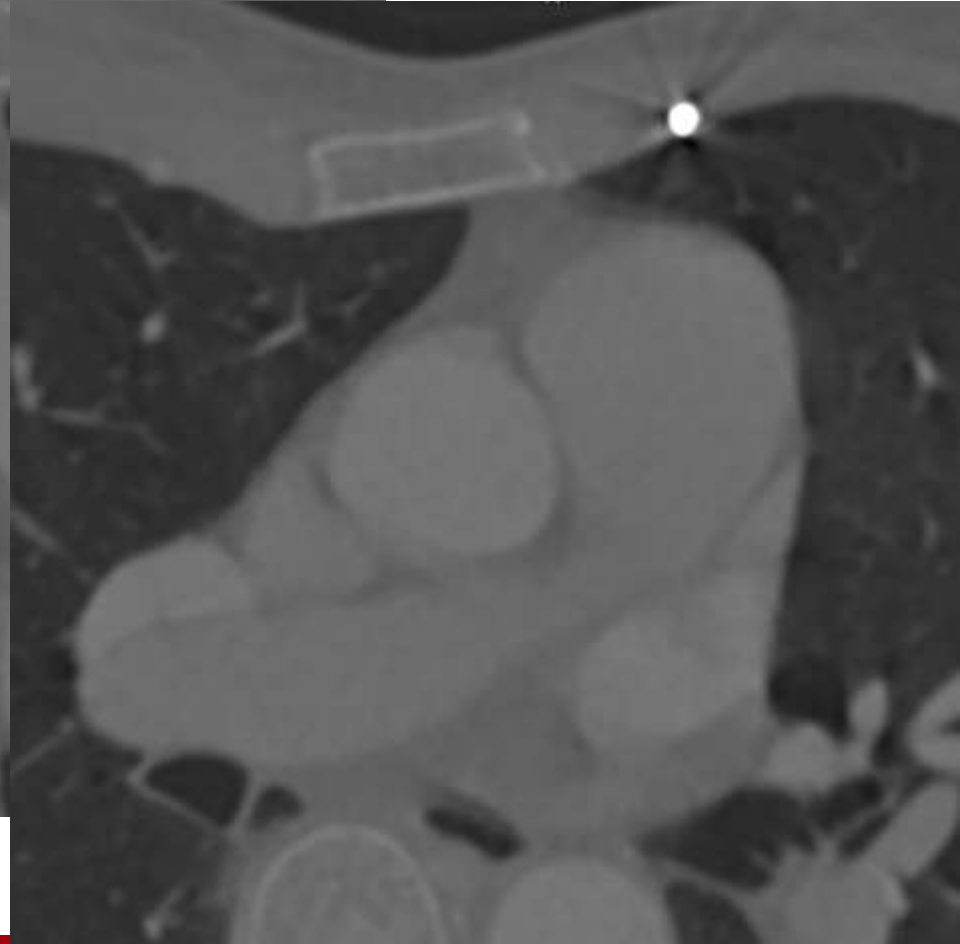
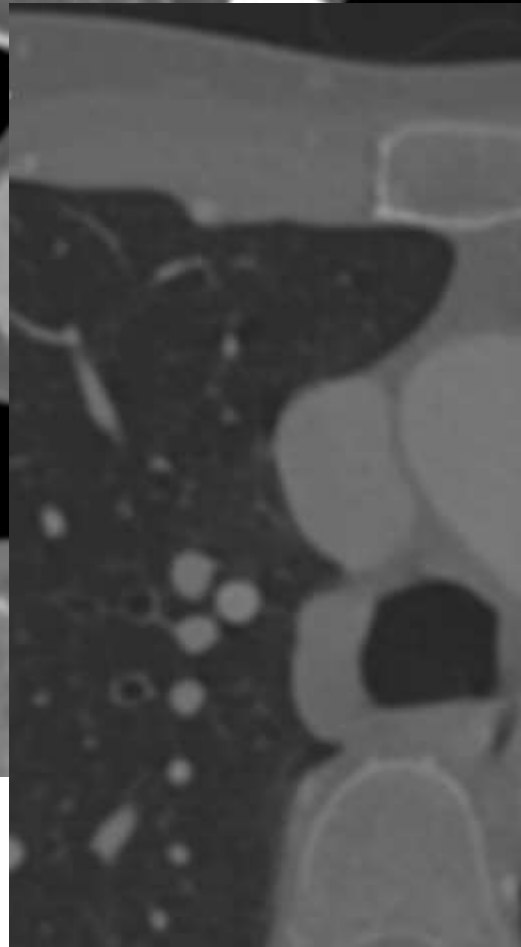
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Follow up 6 months later

- No artefacts



Conclusions

- Embolization with liquid agents is not performed routinely, but it is useful when:
- Reaching the target site is not possible due to the presence of a tortuous artery (splenic aneurysm)
 - Efferent artery (back door) can be embolized from afferent artery (be careful with distal embolization)
- Pseudoaneurysm (close the hole)
- Patients with deranged coagulation parameters, where coils do not work efficiently