PANEL DISCUSSION

Liquid Embolization: From Pipeline to Practice

Experts discuss their experience with liquid embolics, their preferred applications, limitations to use, top tips, and unanswered questions.

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What is your primary experience to date with liquid embolics? In what types of settings or applications do you see as having the best potential for liquid embolics as compared to other options?

Dr. Morris: I became comfortable with liquid embolics in training and continue to use these agents in my day-to-day practice for everything ranging from routine elective cases to emergencies. Where some people might use a coil, I find a thick plug of glue is very effective. And, where some might use particles or polyvinyl alcohol, I like a very wet dilution of glue. Glue reliably shuts down arteries fast, and that's a huge pro for me.

Dr. Tabori: Bleeding and vascular malformations are both uniquely suited to this technology. In both scenarios, you can achieve distal penetration and simultaneous occlusion of the feeding vessel.

Which liquid embolic options do you like to have readily available, and in which scenarios do you find each most applicable?

Dr. Tabori: Glue and Onyx (Medtronic) are my primary experience to date and are both used in practice. We keep TruFill (Cerenovus, part of the Johnson & Johnson family of companies) and Onyx on hand, but we are excited to expand our experience with Obsidio conformable embolic (Boston Scientific Corporation).

Dr. Morris: I like to have glue available, which I use for traumas and bleeds, especially in instances where the patient may be in disseminated intravascular coagulation or on anticoagulation that can't be held. I also use glue for elective cases, such as for prostate artery embolization and renal angiomyolipoma (AML) embolization. I like glue because it's immediately effective and permanent but also customizable. I can mix it with Lipiodol (Guerbet LLC) to suit the needs of the embolization. When embolizing a bleed, I can mix glue to be a little thicker to plug up the culprit vessel. On the other hand, when embolizing a renal AML, I tend to mix glue to be quite watery so it can really permeate into the AML and prevent recurrence.

There are also instances where I find an embolic like Onyx very helpful. For a large arteriovenous malformation or fistula or an aneurysm, I like to fill the nidus with a loose pack of coils and then fill that scaffolding with Onyx to achieve complete occlusion.

I'm also looking forward to using Obsidio and seeing what it can achieve.

What are the current limitations or drawbacks to using liquid embolics?

Dr. Morris: The biggest drawback is the cost. Also, the limitation of only using the microcatheter once or twice can sometimes prevent me from choosing to use

glue. If I have to catheterize a challenging vessel multiple times to achieve complete embolization, I might choose another embolic rather than glue. Having to use multiple microcatheters adds to cost as well.

Dr. Tabori: Penetration of these embolics can be unpredictable. Furthermore, the microcatheter has to be removed and replaced after use.

What are a few top tips for a first-time liquid embolic user? What are your key "don'ts"?

Dr. Tabori: Patience. If there is reflux around the tip of your catheter and it's not coming free, don't pull harder. Wait, and try to jiggle it free every 30 to 60 seconds; it will come loose eventually. Too much pulling too quickly can cause it to snap or embolic to dislodge.

Measure twice, glue once. Measure your intravascular volume to determine what size aliquot to use. To achieve this, I perform a run through the microcatheter. The moment contrast reaches my desired distal penetration location, I stop the number and note the volume.

Dr. Morris: Practice with a test injection of contrast to get a sense of how the blood flow to your target will carry your embolic. Realize that a little bit goes a long way. Know the dead space of your catheter.

Take advantage of easier, more common cases like gastroduodenal artery embolizations and retroperitoneal bleeds—use glue instead of your usual embolic to get a feel for how it works. That will give you the experience and comfort you need to start using glue in more challenging circumstances.

Ask for help from your colleagues. When I started using Onyx in my practice more, I turned to a neurointerventionalist in our group who has a lot of experience with Onyx for his advice, which was very valuable.

What characteristics would you like to see in the next iterations of current platforms or new entries to the market?

Dr. Morris: I would like to see more affordable offerings.

Dr. Tabori: Something that fills the diameter of whatever it's in and the catheter still slides right out, like a tailor-made plug for any vessel.

Where would you most like to see more evidence via ongoing or next trials? What are the key unanswered questions with respect to liquid embolic application?

Dr. Morris: I would like to know just how permanent various dilutions of glue really are. When we mix with Lipiodol, how much glue is necessary in the ratio to ensure permanence? It's always exciting to see how boundaries are being pushed. We are now embolizing prostates with glue. Could fibroids be next? ■

Disclosures
Dr. Morris: None.
Dr. Tabori: Speaker and advisory board, Boston Scientific Corporation.