Why is there an explosion of interest in PAE?

**Sapoval**: PAE is a very interesting procedure, the demand for which looks likely to grow. As of today, we have pretty good proof that PAE is an effective and safe treatment for patients. We still lack Level 1 evidence comparing the results of embolization with those of best medical treatment, but to remedy this we are currently enrolling patients in a randomised controlled trial in France (the PARTEM trial; funded by the French Ministry of Health) that is designed to gather this data.

**Could you please describe your PAE set-up and the imaging you use?**

**Sapoval**: Our interventional suite is equipped with cone-beam CT, which is a very important requirement to perform PAE. With regard to room set-up, ours is similar to the regular set-up for any other embolization procedure achieved via femoral access. While we mostly use the femoral approach for PAE, we are increasing our radial approach practice. We use MRI as pre-interventional imaging to assess the prostate anatomy, but do not routinely use CT angiography. We use conventional angiography and cone-beam CT for guidance during the procedure. The software syngo Embolization Guidance from Siemens Healthineers that we use to target the appropriate artery is very useful.
What is your approach to train interventionalists who want to perform PAE successfully?

Sapoval: Training is mandatory before offering PAE due to the high-risk nature of the intervention. It should be a step-by-step process. When I first learned the procedure, we did not have as many opportunities as we have today with proctorship and access to simulators. We first went to “see” a case in another institution, because seeing – really – is believing.

When you see the first case, you understand the overall intricacies of the technique, and the difficulties but also the rewards that you get from helping patients with this procedure. This is very important, because we need to be passionate about the procedure.

We also offer training at our institution to physicians who want to begin offering PAE. We usually train six or seven people at a time. These interventional radiologists come into the angiosuite and we then perform three cases. They are positioned near the table, see the entire preparation, flow injection, observe the discussion and see the cone-beam CT. At the end of the day, this is a great starting point.

The next step is to have a proctor onsite. This is where an expert comes to the trainee’s institution. You can then schedule two to three cases in a day and the expert can guide you through these. You can also attend one- or two-day courses that are
available from many vendors. There is now also a simulator-based training package for PAE and I would recommend several sessions of practice on a wide variety of cases with the view to improving metrics with respect to radiation protection, radiation dose, the number of attempts made, the time required to reach the appropriate artery, and the mistakes made with regard to anatomy.

As part of the training, it is very important to bring your urologist into the loop. My take-home point is that if your urologist can go to the training centre with you, he will refer cases to you. It is important to remember that urologists may not be entirely familiar with embolization. Some might even believe that embolization entails the release of embolic particles from the aortic bifurcation. When they realize that we go so deeply into the vasculature, use cone-beam CT to understand the anatomy so well and see us at work, urologists are usually reassured.

**Do you have any technical tips to obtain optimal results?**

**Sapoval:** Ensuring excellent technique and offering a “complete” treatment is fundamental. In order to obtain the best response with embolization so that the patient can observe a maximum reduction of symptoms, we use Francisco Carnevale’s PErFeCTED technique, which stands for Proximal Embolization First, Then, Embolize Distal. The most important aspect is to completely embolize all the arteries that go to the prostate, and to try to go as distally as possible.

As of today, there is no way to guess the efficacy of the intervention, based on the angiographic results obtained after the procedure. Sometimes, intra-procedurally we may fail to catheterize a key vessel, and this, of course, will mean that the procedure is unsuccessful. However, there are cases when we obtain angiographic success and great post-procedure images, but then, this does not go on to correlate entirely with clinical success and symptomatic improvement for the patient.

**Do you see any role for functional imaging in PAE?**

**Sapoval:** It is exciting to research the role of functional imaging and to see if it has any intra-procedural role to help make PAE more effective. Functional imaging definitely has a future, but we probably need more time to correctly identify its application in the procedure.
Ideally, we would like to use functional imaging to understand the volume of tissue in which the blood flow was actually blocked, and the volume of the transitional zone that was actually reached by particles. We might also be able to achieve this with radiopaque particles, morphologically, if not in terms of function.

Dr. Sapoval, thank you for taking the time to talk with us.

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To confirm cavernous artery closure and rule out non-targeted embolization, a 5 seconds low dose syngo DynaCT has been performed with manual injection of contrast medium. Embolization agent has then been injected using the PErFeCTED method to ensure distal prostatic artery closure.

The statements by customers of Siemens Healthineers described herein are based on results that were achieved in the customer’s unique setting. Since there is no “typical” hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.