# Example

Figure 15 shows a free flow injection performed on a large hypervascular renal tumor. It is not rare to perform an embolization before a total nephrectomy, as this prevents bleeding or transfusions which would complicate the procedure. Reflux does not represent an issue in this case as the kidney can be sacrificed entirely, which makes this an easy embolization for the interventional radiologist. Start by placing a 5 F catheter at the proximal spot and the tip of the microcatheter in the trunk, about 1 cm away. Inject a high diluted mixture, using a 1:5 or 1:6 ratio. Observe the drops going distally and all the branches being reached by the reflux. Wait for stasis and more reflux. When the endpoint is reached, stop injecting and proceed with removing the microcatheter. There are many advantages to using glue. Indeed, this procedure may also be performed using microparticles, however, an additional mechanical agent should be placed at the main trunk, as microparticles alone would not be enough to occlude such a large area. Combining microparticles with coils or plugs means having to deploy two embolic agents, while glues will ensure you can perform both the distal and the proximal embolization by means of one agent only. Looking at the distribution of the liquid, we can observe that only the ostium is left patent for subsequent ligation, while every other part has been homogeneously reached by the glue. The endpoint is much more clearly visible as compared to a procedure performed using microparticles. Time is also a factor to be taken in consideration. Choosing the right size for the microparticles is an empirical process that requires some time. This method is overall rather time-consuming, as it needs to go through many different stages. First, we have to inject the microparticles very slowly, to ensure proper dilution. Then, we have to decide on the right size. We start the injection and wait for stasis, assess patency, add more particles if needed, taking

breaks between injections to allow for the reflux to stop. Glue, on the other hand, is clear, fast, and efficient. A procedure such as this will only take seconds to perform. Particles are perfectly suitable for some indications; however, it is not the same philosophy in terms of injections.
This is a typical free flow injection that is perfectly suitable for training. One thing to keep in mind is that when we embolize such large vessels, we may notice the bolus of glue growing bigger. In this case, do not fear it will not detach. Keep pushing and apply pressure to make sure it detaches and goes distally. As long as we do not have reflux, we can safely keep injecting the mixture. Once the glue has gone distally, wait for reflux and safely remove the microcatheter. You do not need to wait before doing so.
Figure 15 shows a pseudoaneurysm in the main trunk of the superior mesenteric artery. Most people would probably use a covered stent in this case; however, glue is a favorable alternative that will save the patient form having to take antiplatelet medications or risking long-term in-stent restenosis (ISR). We can use a very low dilution such as 1:0.5, just to make the mixture radiopaque while ensuring fast polymerization. Place the tip of the microcatheter at the back of the false aneurysm and inject very slowly to form a cast. The aneurysm will be filled and nothing will be left in the main trunk. Make sure you refrain from removing the microcatheter too soon and wait about 5 minutes for the polymerization to complete. Retracting the catheter too soon may result in the cast of glue being pulled back and migrating to the main trunk. There is no risk for a hydrophilic microcatheter to stick, especially considering we have the 5 F as a support.