Venous Emergencies During COVID-19: What We've Learned

A conversation with Dr. Akhilesh Sista about the impact that COVID-19 has had on practice, safety protocols, decision-making for venous emergencies, and postprocedure medical therapy and follow-up.

First, how would you briefly summarize the impact on venous services at your hospital during COVID-19?

In all procedural areas, there was a shift to medical management to the extent possible for acute pulmonary embolism (PE) and deep vein thrombosis (DVT). We really had to have a good reason to move a patient around the hospital on the inpatient side and definitely on the outpatient side. Before COVID-19, there had been a trend toward more outpatient-based acute DVT procedures, but most of these procedures and those for chronic venous disease and superficial ablations were put on hold. With time, we started to add procedures for urgent cases, such as for patients who were in pain or who had severe postthrombotic syndrome.

Have you seen more, fewer, or roughly the same amount of venous emergencies during this time?

The number of PE response team (PERT) calls at our institution actually decreased a little during the COVID-19 outbreak, and it's hard to tease out why. I'm not sure how the other New York City hospitals fared in their PERTs, but we noticed a drop-off, perhaps because the physicians taking care of these patients were overwhelmed. There was an influx of physicians caring for COVID-19 patients who were not used to managing intensive care unit (ICU)–level patients because we were drawing from other specialty pools. Thus, some physicians who were volunteering in the ICU or moved to the ICU to help out were not accustomed to the usual processes for PE management. When a COVID-19 patient in the ICU developed clinically significant PE, they were often diagnosed by bedside ultrasound with an echocardiogram showing right heart strain or clot in transit, with the presumption that there was pulmonary artery thrombus because you do not really want to move these patients from the ICU, even to the CT scanner. If patients were doing badly enough, they received systemic thrombolytics, and this is a pretty difficult line to straddle because COVID-19 patients also tended to bleed. So, with the combination of COVID-19 and PE, we were sometimes in a difficult situation.

Have you observed any differences in the clinical presentations or demographics of COVID-19–positive patients presenting with DVT versus those without the virus?

Only anecdotally. It appeared there were more massive DVTs than before and that they would more often propagate despite the patient being on therapeutic anticoagulation, which I have rarely seen. Again, this is only my personal observation. To manage these patients, we had to consider things that we wouldn't have ever considered before. For example, there was a patient with bleeding from COVID-19–related organ damage who then developed a calf DVT, and we had to consider placement of an inferior vena cava (IVC) filter because that patient couldn't be anticoagulated, and there was concern that COVID-19 patients are more likely to have DVT propagation. At the time, there were no data to guide decision-making. You cannot necessarily universally apply traditional venous thromboembolism (VTE) guidelines to all COVID-19 patients because we don't yet understand how COVID-19 modifies VTE.

Would you say that IVC filter use increased in general during that time?

We'd have to look at our numbers; I don't think there was a significant increase. We had attending-to-attending discussions regarding the decision to place an IVC filter. If we decided to place an IVC filter, it had to be pretty compelling, because it meant bringing down a COVID-19–positive patient to the interventional radiology (IR) suite, which we all took very seriously.

What are your team's safety protocols when encountering VTE in a COVID-19–positive patient?

Before we could work clinically, we were all tested for COVID-19. We have a daily symptom check to ensure we have no fever or chills, body ache, loss of taste, or loss of smell. Then, we have appropriate personal protective equipment in the form of an N95 respirator or equivalent, a face shield, and double-gloving gowning to ensure droplets won't touch any part of the skin. After the procedure, we perform a very thorough handwashing.

For the suite itself, we use the hybrid operating room because it has negative pressure. But, if that suite is in use for another case, we put a HEPA (high-efficiency particulate air) filter in another suite and close down the room for an hour after the procedure. The CT scanner is not in a negative pressure room either, so for a CT-guided procedure, we then put the HEPA filter in the room and leave it on for an hour after the procedure ends.

If you could design the perfect facility to handle this situation, what would it look like? Would you have negative pressure capability in every room as a starting point?

This is where COVID-19 is interesting because it has forced us to think about efficiencies in patient transport in ways that we didn't have to think about before. Even before COVID-19, bringing an ICU patient down to the IR suite was a production. You have to gather 15 drips and make sure that somebody is manually ventilating the patient during transport. It usually takes a team of five people to transport that patient down to the IR suite and make sure that the patient is not coding on the way down. It's a big deal, and that's not just for procedures, it's also for CT scans and other nonportable imaging.

Overall, I think this is an issue with the ICU, and I'm sure every ICU physician would say the same. The question is whether there are enough cases in an ICU setting to call for making it easier to move the patient into

a CT scanner on the same floor or into an interventional suite on the same floor. Perhaps there is a role for placing lines under fluoroscopy. Right now, ultrasound is used, but wires are not placed under fluoroscopy. It's an additional safety measure for the patients who can least afford a complication.

Has communication between physicians and teams been affected as a result of the need for safety precautions?

No, I don't think communication has been affected. It is very important for any consulting service to have an individual who is assessing the patient independently and knows what is entailed by having a particular patient undergo a procedure. If you already have the proper communication channels in place, it doesn't necessarily change because the patient has COVID-19. On our side, it was very clear what precautions we had to take. The pandemic has reinforced our process because we are often communicating and interacting with physicians who we would not typically interact with.

How has a COVID-19–positive status affected therapeutic decision-making in VTE cases?

I think everybody became more conservative about VTE procedures. I treated a COVID-19–positive patient who underwent a kidney biopsy and subsequently bled. I went into the renal artery and was attempting to embolize a segmental branch, and I was astounded at how much the patient was clotting intra-arterially on the table. With any sort of catheter manipulation, coils—it was a highly thrombogenic environment. That experience made me really think twice about being aggressive about VTE work. If it were a COVID-19–positive patient with a stable submassive PE, I would have 100% recommended anticoagulation with the understanding that we could consider something else if things worsened, but we really don't know how thrombolytics and aspiration catheters interface with the pulmonary artery in a COVID-19–positive patient.

How has your follow-up care scheduling been modified, and what are your current protocols? How are you typically doing telehealth visits?

NYU really embraced telehealth and so did our division. We mostly converted our visits to telehealth, and frankly, my patients with chronic venous disease were appreciative of telehealth. I don't think we lost a lot from not physically seeing patients. There's a lot of bureaucracy associated with an in-person clinic visit, and is it always necessary? I think that's a question that COVID-19 made very plainly clear, not just in terms of outpatient clinical visits but even inpatient operations.

We do telehealth visits through our electronic medical record, which has the capability to interface with patients. The patient opens an app on their smartphone, and we are notified that a video visit has commenced. We either use our phone or an iPad to connect with that patient, and the visit goes from there.

Has your postprocedural medical therapy regimen changed during the pandemic? If so, why and how?

My hope is that as papers come out on VTE and COVID-19, we're going to get a better sense of what exactly is happening so we can properly make therapeutic decisions. Higher D-dimer levels portend worse outcomes, but it is unclear if those higher levels reflect more thrombus formation and the thrombus itself then causes mortality or if higher D-dimer levels are just a marker for more severe disease. The big debate is whether the inflammation in the pulmonary circulation is causing in situ thrombosis or if thromboembolism actually originates in the pelvic veins or the deep veins of the leg. There is a lack of clarity about the role that thrombosis plays in the morbidity of these patients. I think many of us believe that thrombosis is happening more commonly in COVID-19 patients, although that hasn't uniformly been found in the studies. Some of the European meta-analyses might argue against that, but one Dutch study and a French study demonstrated pretty high rates of VTE in ICU patients. There are a lot of unanswered questions.

What advice do you have for venous practices that may be seeing increased COVID-19 cases in their regions?

My main advice would be to spend time with physicians who will be initially seeing COVID-19 patients. Understand what they are going to be asking of you and develop protocols. Come together about which patients you would consider intervening on and how you're going to handle those patients in terms of keeping yourself and staff safe, keeping the room clean, and what you're going to do after the patient leaves the room. Have escalation policies. Revisit any algorithms and see if they need to be modified for COVID-19–positive patients. ■

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