Discussion to: Assessment of effectiveness and safety of thrombolytic therapy to pulmonary emboli by endobronchial ultrasound-guided transbronchial needle injection

Presenter: Yuki Sata, MD, PhD\textsuperscript{a,b}
Invited Discussant: Patricia Thistlethwaite, MD\textsuperscript{c}
Corresponding Author: Kazuhiro Yasufuku, MD\textsuperscript{a,d}

Dr Yuki Sata (Toronto, Ontario, Canada). Thank you very much for the question. There are guidelines that recommend that a catheter directed tissue plasminogen activator (tPA) administration makes the risk of bleeding higher, so that is why we did not compare with this treatment to catheter administration of tPA.

Dr Thistlethwaite. It’s certainly the wild, wild west out there because I can say, at least at our institution, the standard of care would be a catheter-based thrombolytic delivery. The concern really is, with increased PA pressures after an acute PE, bleeding from the puncture site, either into the mediastinum, into the airway, or into the lung, may be problematic. And if this translates to humans, this is particularly worrisome in people who have submassive and massive PEs because they’re already on heparin or direct oral anticoagulants by the time that they would get to you. Can you comment on the bleeding risk, and how you would deal with the bleeding risk?

Dr Sata. Thank you very much for the question. Regarding the risk of bleeding, we can intubate the patient and if needed, we can do surgery to stop the bleeding. If we proceeded with a clinical trial with this treatment, maybe we would not use anticoagulation before tPA administration because, as you know, the tPA administration in combination with anticoagulation makes the bleeding risk high. As I presented, these techniques effectively dissolve the clot and therefore these patients may not need to be anticoagulated prior to tPA treatment. After tPA administration, the concentration of tPA is reduced significantly to 1/100 after 4 hours. Therefore, we can provide anticoagulation 4 hours after tPA.

Dr Thistlethwaite. Thank you. And finally, most people in the United States perform EBUS in patients under general anesthesia or, at the very least, very heavy sedation. And this does carry some risk in people who have submassive or massive pulmonary emboli. And since catheter-based thrombolytics don’t require this, but your procedure does, I’d like you to comment on the risk of anesthesia in the setting of a massive or submassive PE using your approach.

Dr Sata. Can you repeat the questions again?
Dr Thistlethwaite. Yes, most people do EBUS with the patient under general anesthesia, and that carries risk for patients who are undergoing a submassive or massive PE who are hemodynamically unstable.

Dr Sata. Thank you for your question. We usually perform most of our procedures under conscious sedation without the need of GA and therefore we were planning this to be done without GA.

Dr Thistlethwaite. Thank you very much.

Unidentified Speaker 1. Just as a follow-up on that concept. So even if you did your EBUS under conscious sedation, you still have to mobilize an operating room team, get to the operating room, and get it done. And that’s a time lag. These patients usually would get catheter or infusions started in the emergency department, so to me, that’s a big time sink. I love the idea that we’re trying to expand the modality of EBUS. I love the concept. Just the practicality is the part. Is it practical to do this? What do you think about that?

Dr Sata. Thank you very much for the comment. I think it is practical in our hands. If we are able to use this technique and if it works, we may not need to proceed to more invasive procedure.

Unidentified Speaker 1. And I missed it, but what size needle are you using to inject?

Dr Sata. For injection of the tPA, we used the 25-gauge.

Unidentified Speaker 1. 25, okay.

Dr Sata. For injection of the inject the clot, we used the 21- or 22-gauge needle.

Unidentified Speaker 1. Into the clot.

Dr Sata. No, for injection of the clot to create the PE model.

Unidentified Speaker 1. Could you ever withdraw and vacuum the clot with that needle? I mean, that’s what they do with transcatheter techniques. They use a vacuum system.

Unidentified Speaker 2. One quick question. Paulo Carlos from the University of Sao Paulo. Enjoyed your paper very much and I followed the last paper on the model, so I’d like to focus on the model itself. So, my question is regarding the volume rendering of the clots that you used, right, for calculating volume and coming up with a comparison. So, what kind of software did you use and second, what kind of error do you expect when you do that? Because one thing is getting one solid mass and outline it and measure the voxels, the other thing is getting a stream of clots, they are not regular at all, right? And how did you do that?

Dr Sata. Thank you very much for the question. I used 3D surgery software. This is free software that you can download it. Can you repeat the second question?

Unidentified Speaker 2. Just the accuracy. The precision of measurement.

Dr Sata. Actually, maybe this surgery software is reported previously and as so, they provide how accurate this software is. However, I do not know the accuracy of this software. I wrote the paper using this software.

Unidentified Speaker 2. So, we had better check with the radiologist still. Thank you very much. Very interesting.

Thank you very much, Dr Sata.

Dr Sata. Thank you. Thank you very much.

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