Discussion to: Midterm outcomes of open repair versus endovascular descending thoracic aortic aneurysm repair

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Invited Discussant: Joseph Coselli, MD
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Presenter: Dr Felix Orelaru

Unidentified Speaker 1. Dr Orelaru, great presentation. Thank you. And the manuscript will be discussed by Dr Joseph Coselli from Texas Health Institute in Baylor College of Medicine.

Dr Joseph Coselli (Houston, Tex). Felix, that was a great presentation. Very clear. Thank you and your group for conducting and analyzing this really important series of patients addressing a topic I think that’s serious for all of us. So, you reviewed the patients treated for descending aneurysms from 1993 to 2023 and used the Society of Thoracic Surgeons data warehouse from your Department of Surgery at the University of Michigan. Of 499 patients, you ended up with propensity matching 120 pairs. You basically conclude that your findings don’t support the current guidelines, which recommend thoracic endovascular aortic repair (TEVAR) as the first choice. In your manuscript, you include the Society for Vascular Surgery guidelines, those guidelines from 2010. And you mentioned here the most recent guidelines. So, that’s a pretty strong statement to say that you don’t support that. So, you base this on similar operative mortality, postoperative paralysis, midterm survival, and high reoperation rate. So, let’s review your data really on these three points. The lower-extremity paralysis was identical for the propensity-matched group, as well as the match group for a whole. So that was a wash. The reoperation rate was clearly higher for TEVAR, which has been well-established, and is not uncommon. But, as you showed, it really probably didn’t affect long-term survival, particularly in your match group. And although not statistically significant, you point out that TEVAR had worse midterm survival outcomes of 58% versus 69%.

So, do you think that this could be explained by the fact that your patients who receive TEVAR actually had a significantly greater history of previous myocardial infarction that actually affected their survival compared with the open? So that leaves us with operative mortality. And you note in your manuscript, and you pointed out here, that it wasn’t significant, but may be due to the small sample size. However, in your propensity-matched comparison, the operative mortality was actually 4 times greater in the open group. Not reaching the statistical significance, though. Significance here is elusive as a consequence, probably a very excellent clinical result with consequently a low incidence to deal with. So, if you really wanted to take the same occurrence rate and reach a level of statistical significance, you’d probably almost have to have a doubling of your pairs from 120 to 240. Therefore, despite my sincere wish that your conclusions be so, please help me and the others concretely derive your conclusions from your data.

Also, although you use both hypothermic circulatory arrest and crossclamping, it’s really unclear both here and in your manuscript, which patients had each. And I suggest you might want to add that to the manuscript. So, the question is do you routinely use cerebrospinal fluid drainage in all of your patients who are undergoing hypothermic circulatory arrest, which are going to be maximally heparinized. I’m also a little surprised that your TEVAR cohort began in 2008. The devices were available to all of us in 2005. And then finally, how have the data you got so far—has it changed your current practice? Are you following the guidelines? Are you following what you conclude from your data?

Dr Felix Orelaru (Ann Arbor, Mich). Thank you, Dr Coselli, for the excellent comments. To tackle your last question first, we do follow the current guidelines. And Dr Yang can comment on that, as this is a very recent study. And I think TEVAR truly has been available since 2006. But in this study, our patients are from 2008 just due to availability of data.
However, we didn’t have data prior to that. Dr Patel and his group did publish on that between 1997 and in the early 2000s and had similar findings. Overall, I do agree that our study conclusion is very strong, and that is why I had said we do need to collect more data in order to appropriately test this out. With worse operative outcome in the open aortic repair group, the question is open actually better than TEVAR? But if the reoperation rate is really high in the TEVAR group, and the patients, then we have to start thinking about how do we counsel them when they come to us in the very first surgery in terms of they could have more reoperation later on and that could actually contribute to their morbidity and mortality in the future.

**Dr Coselli.** So, a couple of other things. Thank you for your excellent presentation and your excellent work and results from your group. And I strongly encourage you to one, keep the very low incidents that you have, but continue to collect your data. And maybe it actually will reach statistical significance, will ultimately be to be more impactful. I also find it interesting in your manuscript that some of your reconstruction times are actually on the long side. I don’t really require an explanation for that, but I just looked at 462 of our open cases: 15% had hypothermic circulatory arrest and our reconstruction time, crossclamp time in the nonhypothermic was 28 minutes in the aortic reconstruction, and then the hypothermic time was only 33 minutes. And when we used hypothermic arrest, the perfusion times were only 121 minutes, so just a comment. Great presentation. Keep up the good work.

**Dr Orelaru.** Thanks. I think Dr Yang has some comments.

**Dr Bo Yang (Ann Arbor, Mich).** Thanks for all your questions. Yes, most time we spent less than 30 minutes for the approximate anastomosis. Regarding the choice of open or TEVAR, it was actually the surgeon’s preference. And some surgeons prefer the TEVAR approach, some surgeons prefer the open approach. I personally do more open repair than TEVAR for those patients. If the patient was NOT a surgical candidate, I would choose TEVAR. Yes, I do agree our study needs a bigger sample size. I would say this is a hypothesis-generating study right now. We don’t have a solid conclusion we can make. Thank you.

**Dr Coselli.** Thank you.

**Unidentified Speaker 2.** Bo, who are you doing open? What makes you choose open versus the TEVAR, and what you just said? Because I’m worried some of this cohort is historic versus what we’re looking at now. And it’s hard to compare those that maybe the early stent patients were more fragile, they’re frailer, and you just don’t have a good comparison for them.

**Dr Yang.** Yes, your points are well taken. That’s why we chose 2008 as starting time for this study because of complete data from the Society of Thoracic Surgeons. For the open repair, though, if patient was a surgical candidate, FEV1 was 40%, I do open aortic repair. Young patients with good heart function and kidney function, I offer open repair first, especially patients with connective tissue disease, or chronic dissection.

**Unidentified Speaker 2.** And the other part that I didn’t see as the extent of what you were doing versus how much you’re covering on open, how much you’re taking out. Those kinds of things are going to be difficult in the small group. But I mean, that’s going to be a big deal for the long-term outcomes.

**Dr Yang.** That’s a good question. Most of the open, we did a reverse hemiarch basically from subarcinal artery to the middle point of less curvature down to the normal size descending thoracic aorta depending on where the aneurysm ended. Most of the time, we went down to the area above celiac artery, basically, zone 3 to 5.

**Unidentified Speaker 2.** Yeah.

**Unidentified Speaker 1.** Thank you, Bo. And the one thing you have to accept is that the 15 minutes that Dr Coselli mentioned is actually on the long side. He can do any osmosis extremely fast and extremely effective. So just accept that fact. So next on the microphone, please. Identify yourself.

**Unidentified Speaker 3.** Bo, congrats. That’s a great presentation. One question I have was about your reoperation. Can you specify these reoperations? Are they minor intervention or major intervention? Thanks.

**Dr Orelaru.** Thank you, sir. So, the common cause for reoperation was either increased growth of the distended thoracic aneurysm or in patients with endoleak. And if it’s a—and typically, it’s either type I or type III endoleak, so that would be more of a minor reintervention.

**Unidentified Speaker 2.** But if he’s asking more, was it endo or was it open as a reintervention?

**Dr Orelaru.** I would say if it were due to endoleak, then it would be endo.

**Unidentified Speaker 2.** Was it a stent or was an open reintervention?

**Dr Orelaru.** Oh, got it. Most of the reinterventions were endo.

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