Discussion to: False lumen-dependent segmental arteries are associated with spinal cord injury in frozen elephant trunk procedure for acute type I aortic dissection

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Dr Thomas Beaver (Gainesville, Fla). Thank you for the privilege of discussing this paper and thank you, Dr Ni for a nice presentation. So, as we know in recent years, there’s been a surge of interest in major aortic centers for complete arch reconstruction for type A aortic dissection to avoid dilate distal arch and proximal descending thoracic aortic aneurysm formation, and with the advent of commercially available frozen elephant trunks that has accelerated their use. However, as you noted, in your presentation, the reported paraplegic rate remains at 4.7% as noted in a meta-analysis by Dr Preventza. In your series, the total spinal cord injury rate overall was 15 out of 146 patients or 10%. However, notably, there were 35 patients, 24% of the overall group, who had segmental arteries that came completely off the false lumen at the T9 to L3 level and the critical area of Adamkiewicz, and 12 out of these 35 or 34%, one-third had spinal cord injury vs the 2.7% where the segmental arteries did not come off the false lumen. So, my first question is, given this really relatively high spinal cord injury rate, how has it evolved your practice, and would a less aggressive strategy be warranted in these young patients?

Dr Buqing Ni (Nanjing, China). That’s a great question. Thank you. In my opinion, according to our result, I will choose or limit it to maybe hemi-arch replacement for this kind of patient. But in some condition, we will choose total arch replacements and frozen trunks in some young patients. Such as [inaudible] primary intimal tear or aneurysmal formation in the arch or descending aorta or the supra-aortic arch branches involved and the descending malperfusion and some connective tissue disease such as Marfan syndrome. Thank you.

Dr Beaver. I think it says precisely those patients with malperfusion that might have the false lumen. So, it’s kind of a quandary. In terms of the spinal cord injury itself, 6 of the 15 patients had delayed paraplegia beyond 1 day, yet you guys had an overall spinal cord injury recovery rate of 14 out of 15 patients, which is really remarkable. You had 1 persistent paraplegia at 2 years. So, my second question is, how do you manage the perioperative blood pressure, and should a higher blood pressure be allowed postoperatively? And what do you guys do in terms of your spinal cord injury rescue protocol?

Dr Ni. That’s a great question. In my hospital, normally, we will control the systolic blood pressure under not more than 140 mm mercury. But if the patient presents with postoperative spinal cord injury, and the first thing I will choose is a rising systolic blood pressure, more than 160 mm Hg. And in my hospital, for this kind of patient, we will choose the first thing, the important procedure is cerebral spinal fluid drainage to maintain the intracranial pressure between 5 to 10 mm H2O column. And we also give some medicine just such as methylprednisolone and anticoagulant. I think the rehabilitation training is also important. Thank you.

Dr Beaver. Thank you. And then you it seems like you’ve identified these high-risk patients, and your hypothesis is that the false lumen indeed closes, and these segmental arteries become thrombosed. But just anecdotally, operating on some of these aneurysms from dissections, and my...
anecdotal impression is a lot of times those intercostals will remain patent. So, I just wondered if you had radiographic or computed tomography scan evidence that indeed those arteries are thrombosed?

**Dr Ni.** Yeah, and also a great question. I agree with your opinion. From the computed tomography scan we cannot see the thrombosis in the false lumen. I think maybe because of the patient is the false lumen dependency of the segmental of the artery, which means there are so many small distal reentries. So, this is to maintain the blood supply, so I think this is why most patients have recovered in a short time even after they have a postoperative spinal cord injury happened, thank you.

**Dr Beaver.** Thank you very much.

**Dr Duke Cameron.** Yes, we have 1 minute left for additional questions. Tony?

**Dr Anthony Estrera.** Anthony Estrera. Very nice presentation. Dr Grieb taught us the collateral network. And with time, collateralization occurs. Acute type A in your abstract is 1 to 14 days. Did you specifically look at the time period as it relates to paraplegia in your study from 1 to 14 days?

**Dr Ni.** Yeah, thank you. I think for the acute type A aortic dissection, this is a very acute change. So, if we solve the problem using some cerebral spinal fluid drainage, this may be resolved significantly. Thank you.

**Dr David Spielvogel.** I have just a quick question. Excuse me. In the patients that had spinal cord imaging, what was the level of the infarcts?

**Dr Ni.** From the magnetic resonance imaging, maybe the level is more superior than the T8, sometimes maybe a T5—below T3. So, this is because of the segment artery supply to the spinal cord is more below than the spinal cord. So, from magnetic resonance imaging, the infarction is higher.

**Dr Spielvogel.** This is the piece of this whole puzzle that I don’t quite understand because the infarct levels are higher than what you would expect of where your spinal cord ischemia is anticipated based on perfusion. So, thank you very much for that presentation. We’re going to have to move on. Thank you.