**Title: TCT 22: Sentinel® Cerebral Stroke Protection System During Transcatheter Aortic Valve Replacement**

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**Dr Samir Kapadia**

"- I'm Dr. Samir Kapadia from Cleveland Clinic. I'm the chairman of cardiology and cardiovascular medicine department. And I'm also the PI for the Protected TAVR Trial.

What is the importance of this trial?

So, when we started TAVR to replace the aortic valve, the first editorial by Dr. Shafe was to say that one of the most important things that we need to accomplish is to prevent stroke from happening when we do this procedure. So, in the last 10 years, we have been able to accomplish this for the first time, where we are testing this particular device to see if we can clinically, meaningful way reduces the stroke. So, this is a very important trial, and this is the largest trial in the structured world of TAVR where there are 3000 patients randomized during the pandemic.

Can you briefly tell us about the Sentinel® Cerebral Protection System?

So, sentinel system is a six french system that is delivered through the right radial artery and it protects the right innominate and the right carotid artery. So, when you protect the right innominate, you protect the right carotid, right vertebrae, and the left carotid artery. The only artery that it does not protect by the filter system is the left vertebral artery. And it is introduced, as I said, from the right radial artery. So, it is extremely accessible and safe procedure.

What is the study design, patient selection criteria and endpoints?

So, the study design is fairly straightforward that we wanted to enrol all patients undergoing commercial TAVR with any valve, any risk profile. So, low, intermediate, high-risk patients, or balloon-expandable or self-expanding valves. Every patient was randomised to either have Sentinel or no Sentinel. And we designed the study with 3000 patients, 1500 in each group.

What are the key results?

Interim analysis was designed to be performed at 2100 patients. And the decision was made to continue with the 3000-patient trial at the interim analysis. So, in the Sentinel trial, we saw that the total stroke rate was 2.3% in the Sentinel group versus control group was 2.9%. And this was statistically not significantly different, but the confidence interval would suggest that this is not ruling out the benefits of the Sentinel device. On the other hand, the disabling stroke was 0.5% in the Sentinel group. And 1.3% in the control arm. And this difference was statistically significantly different with a P value of 0.02. This is important information for the patients and physicians to learn that clinically relevant disabling strokes were observed to be less with the Sentinel device use.

What were the challenges with running this trial?

So, the most important challenge doing this trial was that we started the trial during the pandemic and completed the trial during the pandemic. So, to start all the sites remotely, to follow up the patients adequately. So, this is a very practical study. So, we tried to keep the endpoint 72 hours and only patients with stroke, we followed at 30 days. And luckily, we could have an excellent follow up of this patients, but this is the most important logistic challenge of the trial. The second potential problem with the trial or, potential challenge with the trial was that the device was commercially available. So, it is possible that people would use the device in a high-risk - or what they consider-high risk patients and not consider the patients are randomised. So, the trial would be biased against the device. In some ways, if people are pre-selecting the patients who are considered high-risk for the trial and use Sentinel device, commercially available Sentinel device. So, this was a little bit of a challenge to make sure that consecutive patients are enrolled in the trial during the trial design.

How should this impact practice and future research?

So, the practice of TAVR, the most important question for physicians and the patient is to see that how important the stroke to the patient is. And as you know, most patients do not want to have stroke. They are less afraid of death, but more afraid of stroke and especially the disabling stroke. So, this trial informs the operators to say that the disabling stroke was reduced by the use of the Sentinel device and the sentinel device is safe to use. So, with this two information, they can decide whether they want to utilise this device in their practice, but at least in our practice at Cleveland Clinic, we have been using sentinel device in all patients. So, this Sentinel device obviously covers three of the four arteries. So, there are several newer devices and even the newer versions of Sentinel that could have coverage for all these cerebral protection, complete cerebral protection. So, it'll be very important for the future trials to try to understand if we can even improve on this particular goal and prevent even the strokes that were not preventable by Sentinel device. So, the newer devices would be very important to understand. We could not find in this particular trial any particular patient subgroup that requires the Sentinel device more than the others in the sense that the stroke was too much higher in that particular subgroup and or sentinel device was more effective in that particular subgroup. So, the form of the future trials could be to say that if we can still identify the right device and right strategy for an individualised patient currently with this data, we would, we would interpret the data saying that the stroke is unpredictable, and we would use the sentinel or cerebral embolic protection device in all patients to prevent the stroke.”