Transcript Details

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Exploring Lateral Wall Collapse and Hypoglossal Nerve Stimulation in OSA

Announcer:
You're listening to *Clinician's Roundtable* on ReachMD. On this episode, Dr. Daniel Paul Vena will discuss his research on how lateral wall collapse can predict hypoglossal nerve stimulation efficacy in patients with obstructive sleep apnea. Dr. Vena is an Assistant Professor of Medicine at Brigham and Women's Hospital and Harvard Medical School, and he spoke on this topic at the 2025 American Thoracic Society International Conference. Let's hear from him now.

Dr. Vena:
What prompted this investigation into whether or not lateral wall collapse is associated or predictive of hypoglossal nerve stimulation, treatment response, or outcome in OSA patients is it started somewhat serendipitously working with a surgeon at Massachusetts Eye and Ear. He started implanting hypoglossal nerve stimulators shortly before we started working together and started doing many of these procedures called drug-induced sleep endoscopies. And these are where they put you to sleep until your airway starts to collapse, and then the surgeon will see in what direction your airway is collapsing and how severe your airway collapse is. Based on that information, the surgeon can then plan what type of therapy you'd be in line for to treat your sleep apnea. That surgeon himself had done a study prior looking at the role of lateral wall collapse and HGNS outcomes and found that those patients weren't doing as well, and so we sought out to validate that.

In terms of elaborating on the relationship between lateral wall collapse and HGNS efficacy, the hypoglossal nerve stimulator is treating the airway by pulling the tongue forward. So it's moving in a back-forward direction or anteroposterior direction, whereas in lateral walls collapse, the airway is collapsing side to side in the lateral direction. So if you have an area that's collapsing side to side and you pull the tongue more forward, you're not really resolving the type of collapse that that patient has, and so from an intuition standpoint, it makes sense that these patients are doing worse.

Next steps for expanding on the work, we're trying to get an R01 level grant to study lateral collapse in more detail. So we want to go back to the drawing board and say, is it true that CCC—this complete concentric collapse of the soft palate—is it true that these patients are indeed hard to treat with HNS? Because the original study that showed that was a small sample size. And then our hypothesis is that lateral walls collapse will probably have a similar response rate to CCC. So it's really not necessarily CCC as this uniquely hard to treat group, but any patient that has a severe lateral component to their collapse—it's these patients who are hard to treat, and so we want to study that carefully in a physiological sleep study. We want to do a randomized controlled trial showing that when you remove the tonsils from these lateral collapse patients, they are able to do well with HGNS. So it's not that all hope is lost if you have this type of collapse because there is the option to combine that therapy with tonsillectomy. Obviously, you have to have tonsils, but it turns out 60 percent of the lateral collapse sample have tonsils, so it's a decent chunk.

And then the other thing is we're developing tools to estimate whether or not you have lateral collapse using noninvasive means. Specifically what we're focused on is using the air flow from the routine sleep study. So we just look at the shape of the airflow, and there's actually specific patterns of the inspiratory and expiratory airflow that are signatures of lateral collapse, and then there's certain patterns that are signatures of AP collapse patterns, like tongue base and AP velum collapse. We have a paper published that we can predict site of collapse, specifically lateral walls collapse and CCC, using flow shape, and then for the next step, we have the paper under revision showing that flow shape derived lateral wall collapse is strongly associated with HGNS treatment response to a similar degree as the DISE-derived lateral walls collapse.

Announcer:

That was Dr. Daniel Paul Vena discussing how lateral wall collapse from sleep endoscopy and airflow shape can predict hypoglossal nerve stimulation efficacy for obstructive sleep apnea patients. To access this and other episodes in our series, visit *Clinician's Roundtable* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!