

Endobronchial Valve Placement for Emphysema/COPD: Breathing Easy Without Major Surgery

Transcription:

Melanie Cole (Host): Welcome to the podcast series from the specialists at Penn Medicine. I'm Melanie Cole and I invite you to listen as we explore endobronchial valve placement for emphysema and COPD, breathing easier without major surgery. Joining me is Dr. Kevin Ma, he's the Clinical Director of the Bronchoscopic Lung Volume Reduction Program at Penn Medicine. Dr. Ma, it's a pleasure to have you join us today. Tell us a little bit about emphysema and how has treatment evolved over the years.

Kevin Ma, MD (Guest): So, emphysema is one half of the syndrome of COPD where in patients who are smokers or have certain genetic predispositions will have a progressive destruction of their lung tissue. And that leads to narrowing of their airways and a hyperinflation of portions of their lung. And that leads to what's called airflow obstruction and symptoms such as being very short of breath when they walk around, whereas it progresses being very short of breath, even when they're sitting or talking.

In the realm of treating COPD, and in emphysema, more specifically, all patients should be on inhalers. All patients should have pulmonary rehabilitation. But when those therapies have already been tried and patients are still having a lot of symptoms and impact in their quality of life, the next steps are consideration of more advanced therapies.

And historically, the therapy that's really been offered to patients is something called surgical lung volume reduction. And some of the original pioneering work in this field has been done by Dr. Joel Cooper, who was the Head of Thoracic Surgery here at Penn for quite a long time, but a major trial in 2003, proved that in patients with severe emphysema where they have the top parts of both lungs are being affected, that those patients are the ones that do the best with surgery.

But unfortunately, that still leaves certain patients where that's not where their disease lies or certain patients who don't want to take the upfront risk of a surgical procedure where they're kind of out of luck. And the only options are consideration of a lung transplant for a select few of those patients or they just kind of continue with what they have.

But more recently, in the United States, there's this new technology where we are able to place these things called endobronchial valves, which are little kind of umbrellas that go into the airways themselves, where we can specifically target certain portions of the lung, where we can create an artificial deflation of that portion of the lung, which then allows for the better parts of the lung to reinflate, and also allows for the diaphragm to come up to a more comfortable position so that it can function the best it can.

Host: Fascinating. Dr. Ma, for other providers that want to refer their patients for this type of procedure, who are the best patients? Can you speak about patient selection for us?

Dr. Ma: The best patients are patients who have a diagnosis of COPD, who on their pulmonary function test shows severe hyperinflation and air trapping. And what that means is on their pulmonary function testing that they have a total lung capacity, which is the TLC, above a 100% of predicted and a residual volume, which is the RV, that's greater than 150% of predicted. Those are the patients that we're looking for as a very initial screening that should really come and see us if they're still having symptoms from their COPD.

Host: So, then what studies are needed to assess for their candidacy?

Dr. Ma: Once we get to see them, you know, what we really need is a high resolution CT scan and then we also need a six-minute walk test. And those are kind of the preliminary stuff that we need to look at to get a sense of whether they would be good candidates. If based on those studies, they seem to be reasonable candidates, we'll also send off some additional studies, including a perfusion scan, an arterial blood gas, and an echocardiogram, just to evaluate the safety of going through a procedure like this for this patient. If everything checks out, we schedule them for the procedure.

Host: Tell us a little bit about any risks for the patient. How long do the valve stay in? Do they ever need to be adjusted? Tell us a little bit about how it actually works.

Dr. Ma: So, when they get the procedure, they come in typically on a Monday. The procedure is done under general anesthesia. So, for anybody with severe COPD, there's always risks of creating what's called a COPD exacerbation whenever you're doing any procedure in the lungs. That risk is fairly low, but present. If we do place the valves for that patient, one of the biggest risks for a procedure like

this is something called a pneumothorax because we are creating an artificial deflation of one part of the lung, which then leads to reinflation of another part of the lung. That shifting of the lung tissue can create a pneumothorax. And in many patients, that pneumothorax can be very symptomatic. They can have a lot of shortness of breath and discomfort with that.

And for patients getting this procedure, that risk in the first four days is about 25%, which is why when patients come in to get this procedure, we keep them in the hospital for a minimum of three nights doing chest x-rays, symptoms checks just to make sure that they're feeling okay. And if there's any sign that they may be developing a pneumothorax, we're able to respond quickly and effectively.

Host: What's been the patient experience, Dr. Ma? What have they said and how have they really come out through this procedure?

Dr. Ma: It's extremely satisfying to do this procedure. We've had some great home runs with this procedure where we placed the valves, you see that part of the lung artificially collapse and the better parts of the lung reinflate. And when they see us in the office, they say, you know, we've turned back the clock on their disease, two, three years, whereas previously somebody is confined to the first floor of their house being unable to move around because of how short of breath they are; they're now going to the backyard, working in their work shed, carrying groceries in from the car. It's completely changed their life around.

We've had patients who were getting ready for a lung transplant, who've elected to come off the wait list because of how good they're feeling. So, there's been some great homeruns with this procedure.

There are patients where their benefit is more modest. And this is something that we always tell patients going into the procedure based on their scans and their studies, how likely they are to get a benefit and what the likely benefit is going to be. So, we always coach patients and kind of warn them ahead of time, what they could reasonably expect from the procedure.

Host: So, are there some patients for whom this is not indicated? And also when you're telling us that, if a patient has severe COPD, how do you choose which procedure to do on them or go straight to transplant?

Dr. Ma: In terms of patient selection, one of the limitations of endobronchial valves is that we need something called intact fissures, which is the border

between one lobe of the lung and the other lobes of the lung or lobes has to be fully intact because what we're doing is placing these little valves or umbrellas into a specific airway or multiple airways leading into one lobe. But if the fissures are separating, the different lobes are not intact, you can get a side passage of air that kind of sneaks in through the back door, which means that your target lobe will not deflate.

So, the patients will not get a benefit from this procedure. And this is something that we look for based on the CAT scan and also something that we measure for as the initial part of the procedure. So, those are some of the limitations of why somebody with severe emphysema can't get this procedure.

Other ones will be that if they're still smoking, they can't get the procedure. Or if just based on the pulmonary function testing, they don't have enough air trapping, then they're not likely to benefit from something like this. So, those would be the biggest limitations.

In addition, whenever we evaluate a patient for potential endobronchial valve treatment, their case always gets discussed in a multidisciplinary conference that we have twice a month. That includes one of my thoracic surgery colleagues, Dr. Jarrar, where we look at the scans, the studies, what the patient is reporting, to see whether they may be a better candidate for surgical lung volume reduction.

So, anybody seeing me for a valve treatment, is also going to be evaluated for the candidacy for surgical lung volume reduction. We also kind of briefly discussed the idea of lung transplant to them as a potential option in a certain subset of patients if that's something that they're interested in. And if for whatever reason, they can't get the valves or they're not good surgical candidates for lung volume reduction, we always try to plug them into the lung transplant center, if that's something that the patient is interested in.

And vice versa, sometimes when patients are referred to the transplant center and our transplant pulmonologist colleagues decide that transplant is not the best option for them at the moment, they oftentimes referred back to us for value evaluation. So, it kind of goes both ways. So, anybody coming to Penn for advanced management of their COPD will always end up getting multiple evaluations by different docs for the same indication to find the optimal treatment for them.

Host: So, why don't you tell us about some promising new therapies looking forward to the next 10 years or so in the field, Dr. Ma? What's exciting? What would you like other providers to know about what you're doing at Penn Medicine and when you feel it's important they refer?

Dr. Ma: In terms of exciting things coming down the pike, so in terms of valve technology, just like I mentioned before, about the collateral ventilation being a huge limitation in patient selection, there are clinical trials ongoing in Europe, and that will eventually come to the United States about trying to find a way to fix that collateral ventilation or the incomplete fissures by using a type of glue that's delivered through the bronchoscope. And if that pans out, that could really increase the amount of patients that could potentially benefit from this procedure.

In terms of other bronchoscopic treatments for patients with COPD, there are clinical trials, ongoing looking at vagus nerve ablation to kind of minimize the risk of COPD exacerbations. And then there's also another ablation technology that's exploring the idea of ablating goblet cells. So, the cells that are producing mucus to try to minimize the symptoms of patients with chronic bronchitis, which is the second half of the puzzle of somebody with COPD.

So, those are very exciting things that are still kind of in the experimental stages, but have a lot of promise to treating patients who are otherwise maximally treated from inhalers and pulmonary rehabilitation.

Host: What an exciting time to be in your field, Dr. Ma. Thank you so much for joining us today and sharing your incredible expertise.

To refer your patient to Dr. Ma or our other team members at Penn Medicine, please visit our website at pennmedicine.org/refer. Dr. Ma, thank you so much for joining us today and sharing your incredible expertise.

That concludes this episode from the specialists at Penn Medicine. Please remember to subscribe, rate and review this podcast and all the other Penn Medicine podcasts. I'm Melanie Cole.