

Announcer: Hello, my name is Paul Friedman. I'm chair of the Department of Cardiovascular Medicine at Mayo Clinic in the Midwest, and I'm delighted to have with me my colleague, Dr. Adrian DaSilva, a senior associate consultant in the division of circulatory failure, an expert in heart failure and advanced therapies with a special interest in obesity and heart failure. Dr. DaSilva, thank you for joining me.

Dr. Adrian DaSilva: Thank you very much for the invitation. It's a pleasure to be here talking with you about this topic.

Dr. Paul Friedman: Well, it's, it's fascinating. It's interesting and it impacts a lot of people, so let's just jump right into it. The first question I have is, is it common for patients to have both obesity and advanced heart failure? And maybe because I think we'll have a pretty broad audience define advanced heart failure for us as, as you answered that.

Dr. Adrian DaSilva: That's, that's a very good question. So yes, it's very common to have patients suffering from both obesity and heart failure. We know that obesity affects more than 40% of the adults in the US and we also know that heart failure affects more than 6 million of Americans. So we can infer from that that there is significant overlap. Furthermore, we know that obesity per se, increases the risk of heart failure, well, especially the heart failure with preserved ejection fraction. Now you ask a very appropriate question that is important for our audience to understand. We're going to be talking today about advanced heart failure. These are patients with what we know as Stage D heart failure, which means end stage patients in whom we are not able to sustain their, their clinical course to improve their clinical course with medications. Patients who are being readmitted frequently to the hospital that may need the, to wind down their medications, mostly due to problems with their blood pressure, the blood pressure tends to be low, and that's why if they were tolerating higher doses of medications, then they'd end up being peeled off or even, or at least significantly down. These patients may also need very high doses of diuretics and still suffer from significant congestion, from significant swelling of their legs and shortness of breath whenever they pursue physical activity. Sometimes we also see patients that even when they don't meet this previous criteria, they may be suffering from recurrent ventricular tachycardia. Patients that you guys may see in electrophysiology that have these dangerous ventricular arrhythmias and may undergo ablations may be treated with antiarrhythmics very appropriately, but unfortunately may end up needing advanced therapy, especially a transplant. Now, this would be not the traditional end stage heart failure patient, but I'm just mentioning them because we are going to be talking also about the impact of obesity in advanced therapies.

Dr. Paul Friedman: Sure, thank you. And now, in a previous discussion we had on a podcast, you, you made the striking observation that patients with obesity and heart failure, we weren't at that time talking about advanced heart failure, but just heart failure in general tended to have better outcomes, and those who were underweight, presumably from cardiac cachexia did worse. Now, as we focus on advanced heart failure, for example, patients undergoing left implantation, do we see the same thing?

Dr. Adrian DaSilva: Well, you, you're bringing up a very important point to differentiate here. We do see an obesity paradox in patients with heart failure, but when we talk about advanced therapies, it's, it does not seem to be the case, at least when we talk about LVADs. And unfortunately, many patients with obesity tend, especially with BMI, body mass index of 35 or higher tend to have worse outcomes after LVAD implantation. This is very concerning. What are these outcomes? Well, they're very important ones infections, especially associated with their drivelines arrhythmias. In the older LVADs, we used to see more pump thrombosis amongst patients with higher degrees of obesity. Now they, it's not just the type of these type of complications that they suffer more frequently. They also tend to wait longer time to be able to receive a transplant because as you can imagine, the size of the heart that the patients received during transplantation has to be appropriate for the body of the recipient. If your body is much bigger, much heavier, you are likely going to be needing to wait longer for the appropriate match to have to happen. And this is, this is also something that unfortunately we see amongst these patients. Also, amongst patients who undergo transplantation who have higher degrees of obesity, they tend to have worse outcomes. Now, interestingly enough, I mentioned important complications that are more frequent in patients with obesity who receive LAS, but mortality does not seem to be significantly higher amongst patients with obesity who receive LVADs mortality, at least in the studies from the US, has been similar amongst BMI groups. Now, there was a, an important story from France that showed that some patients with higher degrees of obesity may have higher risk of mortality during follow-up, but it was also associated with some risk factors, whereas those patients with obesity and lack of some of these risk factors tended to have the same survival of those as those patients with normal weight.

Dr. Paul Friedman: So what, just to summarize then, I'm hearing you say that patients who are obese with advanced heart failure who get LVAD or transplantation have a higher risk of complications, driveline, infections, et cetera, et cetera, but their mortality is unchanged compared to people who are not obese. Why do you think that is?

Dr. Adrian DaSilva: I think that overall the pumps seem to be good enough as to support these patients for the rest of their of their lives. Now, they may suffer these complications. They may end up needing to receive more frequent care to be readmitted, but somehow these complications, except for some extremes, don't seem to be severe enough in of themselves to threaten their lives. Unfortunately, even when they manage to live longer, sorry, to live the same as their lighter counterparts, the same duration there, they tend to spend more time dealing with these complications and they tend to be readmitted more frequently.

Dr. Paul Friedman: Is there anything that can be done to help improve the outcomes of patients with obesity who do need an LVAD or transplant? Can they safely pursue weight loss therapies like bariatric surgery after having gotten an LVAD or a transplant?

Dr. Adrian DaSilva: This has been a, a topic of a lot of interest in our field over the past decade or so. A few centers around the world have tried to address the obesity amongst the LVAD patients, at least one center pursues bariatric surgery at the same time of LVAD implantation or the majority of the centers actually try to implant the LVAD, allow the patients to recover, try conventional weight loss care, and then if that fails to pursue some other measures such as bariatric surgery. Now, why is this such a big problem? You may ask why do we try to pursue this invasive surgery, these high risk sources on these patients? Well, we know that they tend to have worse outcomes. We know they are less likely to receive a transplant with a high BMI more than 35. So, and we, and we still consider that transplants are the gold standard for patients with end stage heart failure. So usually, when we implant an LVAD, we see a brief weight loss during the first month. Then during the rest of the first year, the weight tends to go up, especially in those patients who had a low body weight or even normal or sometimes even overweight. The BMI tends to go up during their first year. Now, that means also that they tend to accrue significant comorbidity burden during this time. And as you can imagine, when they start accruing them, it becomes a vicious cycle and comorbidities ended up leading towards comorbidities and so on. And their goal, their, the idea of heart transplantation becomes more, more and more distant. So by pursuing bariatric surgery, which is indeed riskier in these patients and warrants a lot of intensive coordination of care warrants, a very skilled, very experienced bariatric surgeon and a very large center experience, not just with bariatric surgery, but dealing also with complex LVAD patients to do it successfully. Now, the experiences have varied among centers, but overall many of these patients have been able to achieve significant weight loss even when their initial BMI has been in the forties, sometimes in the fifties, and some of them have even, well, many of them have even achieved heart transplantation afterwards.

Dr. Paul Friedman: That's remarkable. Are weight loss programs widely available for patients with LVADs?

Dr. Adrian DaSilva: Unfortunately, no. That's not something that every center can offer. As you may see in the regular patient with LVAD. The usual story before they come here is that they're very frustrated because they have been told to pursue diet and exercise as a means to lose weight. Unfortunately, that doesn't seem to work in these patients as we know they cannot exercise, right. Very intensively. Right. So, and then that also sets is a barrier for their level of enthusiasm as well. So we see that they are, they tend to fail these conservative recommendations. In some cases, some patients may try to pursue then transplantation or bariatric surgery at other centers because they are not offered at their home institution. At here at Mayo, for example, we are starting to offer our services for comprehensive weight loss management for these patients with LVADs who have a BMI of 35 or higher who want to pursue such interventions, whether they are weight loss medications, weight loss, endoscopic procedures, or bariatric surgeries. We want to help these patients loosen enough weight so that they can achieve heart transplantation. And even if that was not the main goal, I still firmly believe that these patients still benefit from many of the other health benefits that we see in the regular bariatric population. You can imagine that if their right ventricular function is already compromised, we would expect that to improve after significant weight loss. We would, we would expect their degree of arrhythmias to some somewhat improve, or at least not in to slow down the worsening pattern in their cases. Yeah. So overall, we, I see that these patients tend to do better with this and we want to make it

accessible to any patient, regardless, or the of the institution that they are seeking care right now. We want to help them achieve their goal to achieve a better health, and we believe that partnering with all multiple centers across the nation, we're going to be able to do so.

Dr. Paul Friedman: Well, it's, it's a fascinating topic. It's a complex topic, and it's clear that a comprehensive multidisciplinary approach of people interested in this population, that includes heart failure specialists, bariatric surgeons, nutritionists, others are essential to helping us care for these twice in many ways, twice ill patients with both heart failure and obesity. So Dr. DaSilva, thank you so much for sharing your expertise and comments with us and look forward to hearing more about this in the future as it is such a common and important problem.

Dr. Adrian DaSilva: Thank you very much for the invitation. It's been a pleasure to chat with you about this topic. I hope that it, we continue improving the landscape for the patients.