

Announcer: Hello, my name is Paul Friedman. I'm chair of the Department of Cardiovascular Medicine at Mayo Clinic in Rochester, Minnesota. And I'm delighted to have with me my colleague Dr. Joe Dearani who is a professor of surgery and the president of the Thoracic Surgery Foundation and Chair of the American Board of Thoracic Surgery. Joe, welcome

Dr. Joseph Dearani: Paul. Welcome. I'm glad to be here.

Dr. Paul Friedman: Great. I wanna talk to you today about Tricuspid Valve repair, both congenital and acquired. And maybe we should start with the basics. What are the most common causes of tricuspid regurgitation both acquired and congenital?

Dr. Joseph Dearani: Well, in congenital of course, the poster of diagnosis is Epstein anomaly. I mean, that's, I think many adult cardiologists also appreciate that there is congenital tricuspid valve dysplasia. But honestly, the overwhelming majority of congenital tricuspid valve anomalies is Epstein anomaly in the adult population. It, it's quite variable now. You know, there is tricuspid valve disease that occurs as a secondary, you know, problem from left-sided heart disease, whether it's aortic valve disease or mitral valve disease. Of course, you know, rheumatic valvular heart disease, which we don't really see very commonly in the developed world is another explanation. There is endocarditis, of course, you know, in populations where there's IV drug abuse, that's a very common cause of tricuspid regurgitation. And then finally, you know, ICD and pacemaker lead induced tricuspid regurgitation is something that's being recognized more commonly now, I think because cardiologists are, are looking for it. So there's a real potpourri of lesions that can contribute to tricuspid regurgitation, which, you know, historically has been dismissed as generally not causing, you know, major problems. But I think we're finding out now that it does contribute to heart failure symptoms. And it can be a real challenge for the cardiologist juggling diuretics and afterload reducing agents and things of that sort that, you know, bring up the discussion of intervention.

Dr. Paul Friedman: Yeah, no, many have considered it the new frontier in valvular heart disease and yeah, heart disease with the associations with mortality and whatnot. But historically, there has been a reluctance to offer surgery for isolated tricuspid lesions. Is the risk of tricuspid valve surgery high?

Dr. Joseph Dearani: Well, no, actually, the risk of tricuspid valve surgery is low. The problem is, is that when you look at the literature historically, the results of tricuspid valve surgery, the mortality rates and morbidity rates have been higher. But I, if there's general consensus, it's because we all waited too long before we intervened. Patients had liver disease, they had renal dysfunction, and so it's kind of gave the operation sort of a bad reputation. But when you, you know, offer surgery in a timely manner, particularly if there's high probability of repairing the valve, the risk of surgery is still gonna be very low on the 1% range, particularly if their ventricular function is good. So that's the, that's the, the challenge we, we face as clinicians is it's a combination of educating, you know, clinicians and, and, and

emphasizing that mortality is very, very acceptable in the current era, if you time the intervention properly. And historically, we waited too long. That's the problem.

Dr. Paul Friedman: Now, which do you see more commonly isolated tricuspid valve surgery or concomitant tricuspid valve surgery?

Dr. Joseph Dearani: Well, that's, I'm probably not the best person to ask for that question because I, the tricuspid valve has been, you know, near and dear to me. And so I do a lot of preemptive tricuspid valve surgery. So for me, if I'm doing a left-sided operation, whether it's, you know, whether it's aortic valve disease, mitral valve disease, or a combination of the both, if the tricuspid valve annulus is 38 millimeters or more, even if they have trivial regurgitation, I empirically repair the valve. If it's an aortic root operation, I empirically repair the tricuspid valve because we've, we've seen so often on dismissal echoes or within six months that there's tricuspid regurgitation in these patients that you thought were not gonna be a problem. That I tend to be very proactive with it. So, so I, you know, am doing it pretty liberally here. But in general, I would say that it might be a split down the middle now in terms of, you know, doing it as a part of a left-sided procedure as opposed to a primary indication. Because I think now there's a lot of enthusiasm for primary surgery, particularly for like lead induced, I mean, you're quite familiar with this lead induced tricuspid regurgitation. And then of course endocarditis. You know, that's a tricky one. We don't see a ton of it in Rochester, but around the country, in metropolitan areas, I mean, you know, endocarditis of the tricuspid valve is a really frequent problem and not always an easy solution.

Dr. Paul Friedman: Now when you're doing it concomitantly, say because you're working on an aortic valve or mitral valve and you don't see a lot of tricuspid regurgitation, what does a repair look like? What are you doing exactly?

Dr. Joseph Dearani: Well, I, there it varies. I mean, we've looked at this, you know, internally, whether we do a purse string type of annuloplasty as opposed to putting a band in, you know, for me I put a band in if the primary indication for surgeries, tricuspid regurgitation, if they have pulmonary hypertension, if it's been a complicated repair and you wanna make sure that it holds up if it's an afterthought and it's, it's almost sort of airing on the side of being preemptive, I just do a purse string annuloplasty and we've shown that the durability is actually quite similar between the two and that simplifies the operation, saves a little bit of time. And so, you know, either, either one is, is legitimate, although the true, you know, the true surgeons that really feel strongly about it will use a band.

Dr. Paul Friedman: Now, are there minimally invasive approaches to tricuspid valve operations?

Dr. Joseph Dearani: Sure, we've done a number of them robotically. They can be done through a mini right thoracotomy. For me, I think it depends on the complexity of tricuspid valve repair and, and honestly complicated tricuspid valve surgery is much more difficult than mitral valve surgery. And so I think if it's a simple tricuspid valve repair where all you're doing is putting abandoned, yes, a minimally invasive approach makes perfect sense. But if you're doing stuff in the ventricle, artificial cords, patching leaflets and things of that sort, it may be better to just do it in a conventional manner. If the goal is to really optimize the success of a mitral, of a tricuspid valve repair in an effort to avoid replacement.

Dr. Paul Friedman: Now certainly almost all echocardiograms will show, as you kind of highlighted some measure of tricuspid regurgitation in anyone with heart disease it seems. But how commonly is it performed among surgeons That is, do all surgeons perform tricuspid valve repairs that part of the standard repertoire?

Dr. Joseph Dearani: I think so. I mean that's pretty bread and butter type of, of, of, you know, of a procedure at least for straightforward tricuspid valve repair. If it gets more complicated like in the congenital arena, that's gonna, you know, that that'll, that'll filter out, you know, surgeons that have, you know, have some expertise in it. But I would emphasize, Paul, this is a very important message for the cardiologist is that the decision to intervene on the tricuspid valve should be made before you go to the operating room because the conditions of anesthesia always make things look better than they really are. And it's easy to talk yourself out of doing something. So you know, if, if, if you are thinking that you should do it, you know, from a transthoracic echo before a surgery, you should not change your mind intraoperatively. 'cause it always looks one grade better in the or under anesthesia. And then you're frustrated when they get the dismissal echo and then they're back up to grade three tricuspid regurgitation and you're kicking yourself because you didn't do it.

Dr. Paul Friedman: Is pulmonary hypertension a contraindication to tricuspid valve surgery?

Dr. Joseph Dearani: It's not a contraindication to tricuspid valve surgery. I would say it's a relative contraindication to tricuspid valve repair. I think that, you know, sometimes the durability of a tricuspid valve repair is, is more difficult to achieve when you have pulmonary hypertension, particularly if they have bad liver congestion, they have ascites and they have really true right-sided heart failure. It's probably better to just replace the valve so that you ensure that the, you know, the valve is competent if you wanna get some reversal and remodeling of the ventricle and recovery of, of real right-sided heart failure, you know, you're, you may not get it if you end up with moderate or more residual tr

Dr. Paul Friedman: Yeah. Now you brought up the liver. Do you typically see liver dysfunction improving after tricuspid valve surgery?

Dr. Joseph Dearani: Yes, of course. It depends how advanced the tricuspid valve disease is. If the tricuspid valve disease has been going on for years and decades they've developed cirrhosis, then no. But if they have fibrosis, then yes, I would expect the, the liver, the liver function to improve and, and, and the important, you know, telltale sign for me before surgery is the INR result in the absence of Coumadin, if their INR is normal, the synthetic function of the liver is probably pretty good and I would expect recovery in that patient.

Dr. Paul Friedman: And of course the big question these days is always, what about the role of percutaneous therapy for tricuspid valve diseases? You know, there are a lot of clinical trials going on now and we've treated many patients percutaneously.

Dr. Joseph Dearani: Yeah.

Dr. Paul Friedman: Who do you pick for that's who do you offer surgery? I'm sorry, go ahead.

Dr. Joseph Dearani: Yeah, no, I think it's a good question, Paul. I think honestly in this day and age, it should be reserved quite candidly for patients that are not candidates for surgery. I think the risk of heart block with percutaneous therapies is going to be much higher because you're, you're deploying this right against the conduction tissue. I think that, you know, if, if surgery is timed properly, just like with mitral valve repair, I think when you can do a conventional mitral valve repair or a conventional tricuspid valve repair that is in the best interest of the patient, if it were me, I would want my own tricuspid valve repaired in an anatomic manner as opposed to a percutaneous valve replacement. It will change the history, you know, for that patient indefinitely. Surgery will be tricuspid valve replacement if they come to it. If they don't have heart block, they probably will by the time you, you know, you retrieve and remove the, you know, the percutaneous valve. So I think generally speaking, it should be reserved for patients that are not good candidates for surgery, particularly if the operation is valve repair.

Dr. Paul Friedman: Got it. No, it makes perfect sense. Well, Joe, fascinating area so much, so much progress and so much to learn. Appreciate your time. Great to speak with you today.

Dr. Joseph Dearani: Thanks so much Paul. Great talking to you too.