

2016. Although patients receiving valvectomy had a higher perioperative risk, it was determined to be an independent predictor of operative mortality. No statistical difference of operative mortality was observed between TV repair and replacement (Video 1 and Figure 4). However, to potentially avoid recurrent valve infection and prosthetic valve degeneration, whenever anatomically possible, repair should be the preferred management for TV endocarditis. Although valvectomy was found to be high risk for operative mortality, it could not have been prevented in some cases with a high risk of recidivism.

### Webcast

You can watch a Webcast of this AATS meeting presentation by going to: [https://aats.blob.core.windows.net/media/19%20AM/Monday\\_May6/205BD/205BD/S77%20-%20Endocarditis/S77\\_6\\_webcast\\_025313193.mp4](https://aats.blob.core.windows.net/media/19%20AM/Monday_May6/205BD/205BD/S77%20-%20Endocarditis/S77_6_webcast_025313193.mp4).

Optimum Surgical Treatment for  
Tricuspid Valve Infective Endocarditis:  
Analysis of the STS National Database



LOUISVILLE

### Conflict of Interest Statement

Authors have nothing to disclose with regard to commercial support.

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**Key Words:** infective endocarditis, tricuspid valve, surgical treatment, repair

### Discussion



**Dr Matthew A. Romano** (*Ann Arbor, Mich*). At the University of Michigan, we have seen a marked increase in endocarditis in the past 10 years due to intravenous drug use, and as you have heard today, nationally it has reached epidemic proportions. Its association with the opioid crisis cannot be overstated. In this contemporary, large, retrospective study using the STS database, tricuspid valvectomy was an independent predictor of mortality with an operative mortality of 16%, which is higher than previously reported for a valvectomy series. These patients also had more postoperative complications, and preoperatively they had higher MELD scores, higher WBC counts, lower albumin levels, and lower hematocrits. Understanding the regression model, do you think that the higher operative mortality and morbidity rate are more a reflection of the fact that these patients were sicker than the repair versus replacements rather than the procedure itself?



**Dr Mark S. Slaughter** (*Louisville, KY*). I can comment on our own personal experience, because when you start putting the large numbers together, the standard error bars tend to start getting large and so the mean seems to come together. As a rule of thumb, they tend to be sicker. Generally speaking, they have a larger infection burden, more of them have significant renal dysfunction, they tend to be intubated, and when you see it performed, it is generally more of a salvage operation to reduce the source because you can't get them blood culture free.

In our own hands, the mortality is less; as I am sure you know in our previous publication, it is approximately 2% to 3%. We also treat them differently. We keep them intubated for 1 week, they stay on inotropes to prevent right ventricular dysfunction, and we provide them ongoing support so they continue to get through this time period. But they are very different patients.

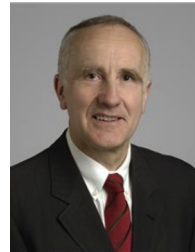
**Dr Romano.** That leads to my second question. Given the concern of recidivism and what has been reported that in the short term valvectomy is well tolerated, some have proposed valvectomy for extreme cases in the absence of pulmonary hypertension followed by a reoperative replacement, and others, such as yourself, have suggested a staged approach with valvectomy followed by a period of antibiotics and reoperative replacement. This study would suggest otherwise. What is your current practice and what do you now recommend?

**Dr Slaughter.** We are extremely hesitant to replace a valve at the time. Unfortunately, in our patient population, the majority of are heroin and meth users, there is at least a 50% recidivism, and we see the result of other surrounding hospitals. I mean, we get their patients after they have replaced their valve, they are 3 months out, and they are incredibly complicated patients. We now repair approximately 70% of the valves. We get them down to what is a monocusp or a bicuspid valve without tricuspid stenosis. In patients we can't repair and we can't get blood culture negative and send them to rehab first, then we would excise their valve.

**Dr Romano.** My last question goes to more of a global perspective on this, what do we do now with these patients? A treatment plan in this patient population is not well defined, and this is a newer population who we are dealing with and will be increasingly dealing with. So what would you propose as a treatment algorithm?

**Dr Slaughter.** Well, I am not going to be that brave. I think a large part of it does depend on the individual patient, because most of these patients, they are not bad people; they have made bad decisions. They will all tell you that they are going to stop doing drugs. The majority of them had been using drugs up to the time of their hospitalization. Realistically, at least if you listen to the experts, it takes 2 years for their brain to reset so that they are not going to be a victim of recidivism. So the idea, if we think that we are going to operate on them and hope that they are not going to use drugs again and they are not going to reinfect their valve, you may be right 50% of the time, but those other 50%, it's a huge problem. And even within that first year, it's an issue. We have difficulty getting patients out of the hospital; you can't send them home with a peripherally inserted catheter line, a lot of them don't have support systems. We found if we can't repair the valve, we have greater success by excising the valve. That way if they can or cannot get their antibiotics, they most likely

won't die of an infection. We usually see them return. We try and get them in rehab. If we can't, then the answer is they have written their own destiny. If they get into rehab, then we bring them back in 1 year, and even then, we have a discrete discussion with them. They get their narcotics for their anesthesia. We give them 24 hours of narcotic therapy, after that they get no further narcotics, and they go home actually still with their mentor, or sponsor, from their drug addiction. If not, we do not have good results.



**Dr Gosta B. Pettersson** (Cleveland, Ohio). One comment and one question.

The comment is that with practice, that we get a lot of, we have become very good at reconstructing these valves with autologous pericardium if they are primary and bovine pericardium if they are not. I don't think that we have replaced the TV in a long time now. My question is regarding the pulmonary sepsis. We often get these patients with a bulky TV, and the intravenous drug users tell us that we should operate on them, and their lungs look like Swiss cheese. What is your approach to that?

**Dr Slaughter.** We still, and I agree with you, get computed tomography scans in everybody, and all of them have multiple septic pulmonary emboli; some of them are bad, some of them rupture, and they actually have empyema. We will drain their empyema first, and we will give them 7 to 10 days of intravenous antibiotics, because if we can get them blood culture negative, as was similarly mentioned, I don't care what the size of the vegetation is, they are going to survive it in the long run. So if we get them blood culture negative, we then get them into rehab and bring them in much later. So the only patients who we are operating on are those who we cannot get blood culture negative, and generally they also have annular abscesses that we have some difficulty reconstructing. But I agree with you now, we have gotten much better and can repair at least 70% of them.

**Dr Pettersson.** Do you use any vacuum to remove.

**Dr Slaughter.** The AngioVac? We intermittently have tried that. And there is actually a recent paper from Cornell, and they did a meta-analysis, and even in that, they say 75% of the time they get it all. The problem is, those are the patients who have ongoing positive blood cultures where you really need to get it all. Likewise, the mortality rate in that study was 14%; it's identical actually to a surgical operation. So I am not sure there is a huge advantage. We do it occasionally.

What we see more often is the patient who went to the cardiologist first. We were never called. They failed antibiotic therapy. Ten days later they do AngioVac, then they are still blood culture positive, now they are on dialysis, intubated, and on vasopressin. So we are not big fans.