

STEVE OMMEN: Hello and welcome. My name is Steve Ommen. I'm a cardiologist at Mayo Clinic in Rochester, Minnesota. And the Directory of our Hypertrophic Cardiomyopathy Clinic. I'd like to welcome today Dr. Hartzell Schaff, who is one of the leaders in cardiac surgery for the treatment of patients with symptomatic hypertrophic cardiomyopathy. Hartzell, thank you for being here.

HARTZELL Thank you.

SCHAFF:

STEVE OMMEN: Can you give us a sketch of the history of myectomy and surgical management of HCM at Mayo Clinic.

HARTZELL Well, the earliest cases that were done were performed by Dr. John Kirkland and Dr. Dwight Magoon. Those

SCHAFF: surgeons performed septal myectomies. There were a variety of techniques that were used in early days, transaortic myectomy, transventricular septal myectomy. And at the same time, Glenn Morrow was doing this operation at the NIH in Bethesda.

But the Mayo Clinic has really had a long history of surgical treatment for hypertrophic cardiomyopathy.

STEVE OMMEN: And so how has that technique evolved from the original myotomy to the procedure that you're performing now. Can give us a little bit of insight to that?

HARTZELL Right, as you mentioned, the first operations were called myotomy myectomy because in some cases, the

SCHAFF: surgeons just made a slit in the septum to try to open up the outflow tract. In other cases, a small piece of muscle was taken from the septum and then that was widened further digitally. Now we do what we call and others call an extended septal myectomy, which is a wider excision of the septum beneath the aortic valve but also it extends more towards the apex of the heart, because we found that most patients that have recurrent obstruction have recurrence because the surgeon did not take muscle far enough towards the apex. So if you extend that towards the apex, it improves outcomes.

STEVE OMMEN: Can you describe what you think is the ideal patient for myectomy? Academic

HARTZELL Well, the patients that we see most commonly are patients who are very symptomatic with exertional dyspnea,

SCHAFF: or chest pain, or syncope. And the patients have failed medical treatment and are really quite limited. And it's interesting in my experience, there's two groups of patients. Some of them become symptomatic quite rapidly, and they will tell you when their symptoms developed almost to the month. And we see them within 6 to 12 months of the onset of their symptoms. There is another group of patients who really become symptomatic very slowly and seem to live around their disability, as we say sometimes, because they are almost like the patients that had rheumatic mitral valve disease. They just slow down, they slow down, they avoid those activities, those stairs, the walks that they used to take. So a few patients have been symptomatic longer. The patients we see, I'd say most often, are patients in their 40s and 50s who've become symptomatic over 12 months.

STEVE OMMEN: So hypertrophic cardiomyopathy is less common than coronary artery disease and valvular disease in our patients. So the number of myectomy procedures is relatively small compared to that. Can you make comments about the expertise required to do a myectomy and kind of where you think this is going as a specialty in terms of the surgical approach.

HARTZELL Well, this is a very exciting point. I recall as a resident, I wondered and I talked to one of our staff physicians, and
SCHAFF: asked why we weren't doing any myectomies. And I was told that there were so few that were necessary, they can all be done in Bethesda by Dr. Andrew Morrow, who was a pioneer in this area. And that seemed to make sense to me that if there weren't very many to be done.

But a couple of things have happened. I think, first of all, the number of patients who have hypertrophic cardiomyopathy is really quite large. And the number of patients who have obstruction with hypertrophic cardiomyopathy is much greater than we used to think. We used to think that patients had to have high resting gradients to be candidates for surgery. And we used to think that obstruction only occurred in a minority of patients, 10% or 15%. Now we know that obstruction occurs and accounts for symptoms in over maybe 70% of patients. So it's a much larger pool of patients, even though as you point out, it's less common than coronary artery disease.

We've done over 2,000 myectomies at Mayo Clinic and so we have a very large experience with it. I think it's true that that in most practices, surgical practices, these patients don't come along very often, but we do have a large experience here.

STEVE OMMEN: So in terms of the expertise required to do it, if a surgeon is not seeing referrals for HCM very often, what sort of volume or experience should someone have before they tackle a patient with hypertrophic cardiomyopathy from the surgeon standpoint?

HARTZELL Well, that's a difficult area for a couple of reasons. First of all, it's not only the number of cases that you have to
SCHAFF: see and to do to gain some experience, it's a difficult operation to teach people to do, because the visualization is not good. It's one of those surgical procedures where the surgeon may have adequate exposure, but it's difficult for everybody else in the operating room to see, so it's harder to teach residents to do this operation than others. So if a resident saw or scrubbed on five or 10 cases during the course of three years of the residency, the number of cases that they really saw and could say I know how to do it because you put the knife right here, is much, much less than that.

Now, how many cases do you have to do before you become comfortable? I would say in my own practice, I think it was certainly 15 or 20 before you feel like you know the anatomy well. It's true that it's an area that you may have some exposure to if you're a congenital surgeon and you're doing membranectomies or limited myectomies for congenital subaortic stenosis. But I think extensive myectomies is difficult to teach people.

STEVE OMMEN: You have also pioneered an approach to patients with hypertrophic cardiomyopathy who have such severe hypertrophy they almost have no ventricular chambers. Their stroke volume is limited by the amount of hypertrophy rather than obstruction. Can you talk about your approach to those patients?

HARTZELL Right, most or some patients with atypical hypertrophic cardiomyopathy have symptoms due to diastolic
SCHAFF: dysfunction, not just related to the intrinsic stiffness of the muscle or the thickness of the free wall, but due to the fact that their chamber size is small. And it occurred to us that these patients might improve if you remodel the ventricle by enlarging it.

Now in apical hypertrophic cardiomyopathy, the apex really doesn't move at all. There is no contraction. So to make an incision there doesn't hurt the patient in the end. So we can make a small one inch or 1 and 1/2 inch incision, just at the apex of the heart and enlarge the ventricle through that aperture. And it's interesting in the cases we've done, and I think we've done about 60 operations this way for enlarging the ventricle, we have seen improvement in diastolic function. Rick Nishimura, as you know, has done some post-op casts on the patients and looked at pressure volume loops and I think has pretty clearly demonstrated that you improve diastolic function.

Now, the other side of that is a lot of patients with apical hypertrophic cardiomyopathy have no symptoms and don't need the operation. But certainly if they have a lot of heart failure, short of a transplant, this is really the only surgical option for them.

The approach is also helpful for patients with midventricular obstruction. And we've seen another 40 or 50 patients who have had operation for midventricular obstruction and we've used the same approach through the apex because for true midventricular obstruction, it's very difficult or impossible to get it through the transaortic approach.

STEVE OMMEN: Thank you. And thank you for your collaboration on our HCM patients. It's been quite a successful endeavor with a combination of cardiology and cardiac surgery at Mayo Clinic over the years.

HARTZELL Thank you.

SCHAFF:

STEVE OMMEN: I want to thank the audience for joining us today. And invite you to come back soon to view more conversations with Mayo Clinic cardiology and cardiovascular surgery.