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Discussion

DR. J. L. VILLAVICENCIO (Washington, D.C.): It gives me great pleasure to discuss this fine paper by Dr. Dean and collaborators. Keep your ears attuned to Southern accents, as my comments have to do with our experience in the last 20 years at Children's Hospital in Mexico City, with a very nasty disease that produces lesions in the thoracoabdominal aorta and its branches.

(Slide) With narrowing or occlusion of the aorta and the renal artery in the very young patient, the disease is called nonspecific obstructive arteritis, or Takayashu's disease, and hypertension is a prominent and ominous symptom. One of my former students, Dr. Lupi-Herrera, in 1977 reported 107 cases of this disease studied at the National Institute of Cardiology at Mexico City.

Seventy-two per cent of these patients have hypertension as the dominant symptom. My associate, Dr. Yonzalez-Cerna, and I operated on 22 such patients. (Slide) The ages were between 5 and 23 years, with 86 of them being children of less than 13 years of age. Females were two-thirds of our patients.

The distribution of the lesions is of interest, (slide) since 18 of the 22 have lesions involving the aorta and the renal artery. The most important aspect of these cases is that the hypertension was refractory to medical management. Often the patients have to be operated on almost under desperate conditions, (slide) 68% of them having hypertensive encephalopathy and convulsions, and 32% of them presenting with congestive heart failure.

Surgery is challenging on these small scarred vessels, but is the only alternative. We lost three patients in our first 22 patients, and none in our last 11 patients, who have not been demonstrated in this slide. That gave us a mortality of 9%.

I would like to ask Dr. Dean what has been his experience with this disease, what his indications are, and the role of nephrectomy in renal vascular hypertension.

DR. VICTOR M. BERNHARD (Philadelphia, Pennsylvania): Dr. Ravitch, I have really enjoyed this presentation by Dr. Dean and his colleagues. We have heard a very careful and thoughtful analysis of a critical problem that has provided us with a discriminant rule for selecting patients who are at high risk from a variety of associated diseases. I concur with their conclusions, which I think many of us have applied without the benefit of their elegant statistical studies.

However, there are 50 patients and only six deaths. Therefore, it is a little difficult to clearly evaluate their analysis. I suspect the questionably significant factors would have been clearly significant if the series were twice as large. We will certainly be interested in the results of a prospective application of the discriminant algorithm that he has recommended. I commend to you his manuscript, which is extremely well written and thoroughly describes the elaborate statistical evaluation that he has presented.

I have the following three questions to ask the author. Coronary bypass patients are included in the high-risk category. How vigorously have you pursued angiographic evaluation of these patients and subsequent coronary bypass when indicated as a preliminary when you have had the luxury of time prior to doing the aortic and renal procedure? In the experience of many of us, the patient with severe coronary disease who has had aortocoronary bypass walks an iron bridge and is no longer in the high-risk group.

A second question relates to techniques. In that patient at high risk who requires revascularization and in whom the aortic lesion is neither life- nor limb-threatening, what procedure do you prefer, *i.e.*, a bypass from a distal artery when the aorta is not significantly compromised or when the aneurysm is minimal, bypass from the splenic and/or the hepatic vessels, or transaortic endarterectomy?

Finally, there is a group of patients discussed in his manuscript who were at normal risk for aortic surgery with an associated tight stenosis of the renal artery who did not have significant hypertension and did not have lateralization by renin studies or by split functions. Many of us would repair both the aorta and the renal arteries because the patient is at low risk, the abdomen is open for aortic repair, and the renal lesion is a potential problem. What has happened to those patients with this picture in your experience who did not have renal artery repair and how often have you had to do something about them subsequently?

DR. G. MELVILLE WILLIAMS (Baltimore, Maryland): Dr. Dean was kind enough to leave his manuscript with me, and I want to compliment him for his good results, and raise the following real issue.

The dilemma that we have is not, perhaps, so much sorting out who is at high risk to have an operation, but what the alternative is. Namely, what is the risk to that same individual of leaving him as he is?

Dr. Dean, I think, has provided us with as much information as we currently now have about what happens to kidneys that are fed by a very stenotic renal artery. We know that a lot of them die on the vine. When you combine that with the cumulative effects of hypertension promoting small vessel disease, which is the one thing we cannot do anything about surgically, it really means that the people that you are not operating on are consigned to a relatively early death.

So when you are stuck, even when you have these constellation of risk factors that would predict an 80% mortality, the question them comes up of: What are you going to do with this particular patient? Are there ways out of this box?

For example, how often have you considered balloon dilatation of the renal artery to fix one system, and then proceeding with the other one?

It is interesting, I think, in this paper and the one to follow, and in our own experience, where we have treated 66 of these complex patients and had six deaths, the mortality is amazingly constant at 10%, or thereabouts, and I agree it is too high, but at the same time I think this is a difficult group of patients, and I am very eagerly awaiting Dr. Stoney's presentation, to tell us: Is it worth doing all of this surgery for these complex patients? I would be interested in your views about that as well.

DR. JONATHAN E. RHOADS (Philadelphia, Pennsylvania): I think the previous discussants have really pointed out my question. I thought the problem was not so much one of predicting which patients were at high risk, as in comparing the combined procedure with a staged procedure with no procedure at all. And, I wondered if Dr. Dean could tell us what happened if the procedure was withheld, or divided into two parts.

DR. MICHAEL E. DEBAKEY (Houston, Texas): I was reluctant to approach, because I do not have a great deal to add to this discussion.

We have had experience with these problems. As those of you know who are familiar with the published reports on this subject, we have been writing about this problem for more than 25 years and have continuously tried to address some of the questions and issues that have been raised in the paper presented.

It is important to try to determine the predictors statistically, and I want to congratulate the authors for their attempts to do so.

In assessing any patient with a complex condition, one must try to judge whether the benefits outweigh the risks of the surgical procedure. This applies to all surgical procedures, as we all know, and it is sometimes very difficult to determine this.

I can tell you from our own experience that in most patients who are not treated, but who have these very serious, complex vascular conditions, which include aneurysms as well as occlusive disease—particularly aneurysms, and especially the thoracoabdominal forms—the risk of doing nothing is extremely dangerous and also leads to early death, particularly if the patients have severe hypertension, because the medical control of that hypertension is extremely difficult at best under these circumstances.

From our own experience, we have generally been inclined to perform the complete operation, rather than staged procedures (which we tried early in our experience) because we have since learned—and it may be because our experience has led to improvements in the technical approach to the procedure—the results as well as the mortality rate are much better.

In a recent paper that we published a couple of years ago about our experience, with a 20 year follow-up, we clearly showed that these results are maintained for a long time and that there are benefits from repairing these very severe lesions.

DR. RICHARD H. DEAN (Closing discussion): In response to the questions, I would like to suggest that Lionel Villavivencio was standing up here with a little inappropriate modesty by asking me how to deal with Takayasu's disease. As all of you know, he probably has the world's largest experience with it. In response to your questions about Takayasu's disease, I would simply say, "Whatever you write, it is probably what I would do." (Laughter)

Our experience in children is primarily with congenital lesions, and we have, I think, no patient that has, in fact, turned out to have Takayasu's disease. They had extensive aortic and renal involvement by hypoplastic vessels but without inflammation or perivascular reaction. So I would not mislead the audience by commenting on what I would do for Takayasu's disease other than state that I would call you.

In regard to the role of nephrectomy in both children and adults, I think that our attitude is fairly conservative. We basically only apply nephrectomy when a patient has a nonfunctioning kidney and an unreconstructable vessel. The definition of an unreconstructable vessel has certainly contracted over the last 10 years. Unless they have that and have uncontrollable hypertension, we would not employ nephrectomy, especially in children. Instead, we would manage such children with antihypertensive medications, rather than perform nephrectomy in a disease process we know nothing about and is frequently progressive.

In regard to Victor Bernhard's questions, I would like to say that I am happy that we did not have more than operative deaths and thereby were unable to identify factors that gained statistical significance. I would be quite happy to never reach statistical significance with any of these factors. This fact, however, pointed out the value of the cumulative risk factor assessment and the discriminant analysis.

In regard to heart disease, I think that Victor is quite right, and we certainly share the attitude that there should be a very aggressive preoperative assessment of the coronary artery disease, as well as any other area, and a very aggressive attitude towards correcting the potentially lethal problems. This is done both to reduce operative risk and even potentially improve prolonged survival after operation by reducing the incidence of myocardial infarction, the primary source of death during follow-up in this and most other series of vascular procedures.

The previous history of coronary artery disease, although used in the history of heart disease analysis portion of our analysis, did not prove to be of a powerful discriminant. In contrast, the positive EKG was found to be a significant variable relative to risk of operation. If they had a positive EKG for ischemia or LVH with or without strain, we considered that a significant risk factor for operation, especially if it could not be improved upon by preliminary coronary artery bypass. All patients who have evidence of ischemia before surgery now go on to coronary angiography, and, if appropriate, coronary artery bypass before surgery. So we think that we have reduced the incidence of myocardial infarction in the perioperative period to a degree that we cannot further reduce.

In regard to the other end of the spectrum, the question that Dr. Bernhard, again, pointed out—what vessel or what aorta does not need to be dealt with?—our attitude, I think, continuously has been that if the aortoiliac occlusion does not require correction because of clinical indications, it does not require operation. We have yet to have to replace an aorta because we–quote–couldn't sew into it. We have usually performed an endarterectomy of the region to be used for aortic anastomosis of the renal artery graft only. We believe that one can deal with such patients without the necessity of aortic replacement, and thereby decrease the magnitude of the hemodynamic alterations during surgery and the associated operative risk to the lowest appropriate level.

The question addressed by Dr. Rhoads and Dr. DeBakey, namely, when to stage procedures, when not to do procedures, and when to do combined procedures, comes back to a point that Mel Williams pointed out; that is, when are we really doing a procedure that is, maybe, not at too high a risk, but is not going to improve longevity, and when are we doing a procedure that, although it improves longevity, is at significantly increased risk? Certainly, the patient with the large abdominal aortic aneurysm and severe renovascular lesions bilaterally may be at significantly increased risk of operation, but the benefits of operation in such combined procedures, I would agree, far outweigh the risk. It is only in the subgroup of people—and I think that is the point that we would like to make in closing—that have significant risk factors that cannot be corrected by the operation, in whom you plan to do an extensive procedure such as this, that we would feel that such techniques as percutaneous transluminal angioplasty, though potentially only temporary in its benefit, may improve the patient's risk with large procedures and the like.