The devil is in the details

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Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication March 8, 2018; accepted for publication March 12, 2018; available ahead of print April 13, 2018.

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J Thorac Cardiovasc Surg 2018;156:598-9

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2018.03.025>

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Central Message

Long-term technical success of treatment for aortic insufficiency is based on a complete understanding of the anatomy and physiology of the aortic valve and root.

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“Pay attention to the details” is something I often heard from my teachers when I started my surgical residency in 1978. At that time, isolated aortic valve disease was treated with aortic valve replacement for both aortic stenosis and aortic insufficiency (AI). The vast majority of valves used were rigid, either a mechanical valve or a tissue valve on a frame. There generally were few details in how one excised and then replaced the valve, other than the valve choice and suture placement and choice. Aortic valve replacement has saved and bettered countless lives and is one of the true triumphs of cardiac surgery. If you search the literature, you will even find articles that claim that aortic valve replacement with mechanical or stented tissue valves returned patients to a normal life span. This brings to mind the well-known aphorism, “There are three kinds of lies: lies, damned lies, and statistics.” We as surgeons sometimes delude ourselves as to what we really achieve. An artificial valve is much better than the diseased valve it replaces, but never as good as a normally functioning native valve. The insurance industry has looked at this closely, because they have money riding on the outcome, and it has been shown in meta-analysis of the surgical literature that both mechanical and stented tissue valves shorten your life span from the expected span with a functioning valve, and that the younger you are when you have your aortic valve replacement, the more years you lose.¹ In the mitral arena, starting with the seminal work of Carpentier,² we began to see both the early and late survival advantages of valve repair and maintaining the native valve. Longer term follow-up showed that successful mitral repair can lead to return to an expected life span.

The Brussels group of Gebrine El Khoury, whose work appears in this issue of *The Journal of Thoracic and Cardiovascular Surgery* under the authorship of Nawaytou and colleagues,³ are leaders in the arena of aortic valve repair for AI. El Khoury and his group have written extensively on the subject of aortic valve repair, helping establish a system of classification as well as technical steps

in repair. In their article, Nawaytou and colleagues,³ look at the specific case of moderate or more AI in patients with a bicuspid aortic valve and a dilated ventriculoaortic junction. They present data from 100 patients treated in an almost 16-year period with either reimplantation ($n = 93$) or an external ring ($n = 7$). There were no in-hospital deaths, and only 1 patient had AI of 2+ or greater at discharge. At 8 years, the freedom from AI remained greater than 96%. Although these excellent outcomes are of interest—and what we have come to expect from this group—the real interest to me was the excellent description of the “sinking sinus” and migration of the ventricular muscle often seen in this subset of patients with bicuspid aortic valve. Support of this area is crucial for long-term success of the repair, but dissection at the left right commissure and the right cusp is complicated by the right ventricular outflow tract muscle attachments. This complication can lead surgeons to do an incomplete dissection to the true level of valve attachment, either from a misunderstanding of how deep this can be in these patients or from a fear of entering the right ventricle. The article of Nawaytou and colleagues³ does an excellent job both of presenting the technical details necessary to accomplish this dissection properly and of allaying fears of right ventricular entry with repair. The treatment of aortic stenosis is already moving toward catheter-based therapies for many patients, and catheter-based valves

continue to be developed specifically for AI. Aortic valve centers of excellence need to incorporate these techniques into their programs to remain competitive; to be competitive, however, we also need to continue to show excellent long-term results such as those seen in the article of Nawaytou and colleagues.³ That long-term technical success is based on a complete understanding of the anatomy and physiology of the aortic valve and root. Without the understanding of the anatomy and physiology of the root described in the article of Nawaytou and colleagues,³

long-term success will be elusive. Read the article for the details. The devil is in the details.

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