

# Practical guidelines for aortic valve surgery and the current role of the Heart Team. Case report

## *Guía práctica para la cirugía de la válvula aórtica y el papel actual del Equipo Cardíaco. Informe de caso*

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### ABSTRACT

Aortic valve replacement is the second most common cardiac surgery in adults, primarily due to aortic stenosis. While both surgical aortic valve replacement (SAVR) and transcatheter aortic valve replacement (TAVR) have well-defined indications, the increasing availability of TAVR has led to its use in cases that may not meet clinical guidelines criteria. This article discusses practical indications by guidelines for aortic valve surgery and the critical role of a multidisciplinary Heart Team in decision-making. A case report of a 63-year-old asymptomatic male with a bicuspid aortic valve and mild-to-moderate aortic insufficiency is presented. Initially recommended as a candidate for TAVR without clear clinical indications, the patient sought a second opinion, leading to a comprehensive evaluation by a Heart Team. Stress echocardiography and guideline-based assessment determined that conservative management was the most appropriate course of action, preventing an unnecessary procedure. This case highlights the risks associated with the overuse of TAVR in “off-label” scenarios and emphasizes the importance of structured decision-making through a heart team approach. Additionally, it underscores the value of insurance-mandated second opinions in safeguarding patients from unwarranted interventions. To ensure appropriate patient selection and adherence to best practices, there is an urgent need for broader advocacy for multidisciplinary Heart Teams within accredited surgical organizations.

### RESUMEN

El reemplazo valvular aórtico es la segunda cirugía cardíaca más común en adultos, principalmente debido a la estenosis aórtica. Si bien tanto el reemplazo valvular aórtico quirúrgico como el reemplazo valvular aórtico transcathéter tienen indicaciones bien definidas, la creciente disponibilidad del reemplazo valvular aórtico transcathéter ha llevado a su uso en casos que pueden no cumplir con las pautas clínicas. Este artículo analiza las indicaciones prácticas para la cirugía valvular aórtica y el papel fundamental de un equipo cardíaco multidisciplinario en la toma de decisiones. Se presenta el reporte de caso de un hombre asintomático de 63 años con una válvula aórtica bicúspide e insuficiencia aórtica leve a moderada. Inicialmente se le recomendó reemplazo valvular aórtico transcathéter sin indicaciones clínicas claras, pero el paciente buscó una segunda opinión, lo que llevó a una evaluación integral por parte de un Equipo Cardíaco. La ecocardiografía de estrés y la evaluación basada en las directrices clínicas oficiales determinaron que el tratamiento conservador era el curso de acción más adecuado, lo que evitó un procedimiento innecesario. Este caso destaca los riesgos asociados con el uso excesivo de reemplazo valvular aórtico transcathéter en escenarios “fuera de etiqueta” y enfatiza la importancia de la toma de decisiones estructurada a través de un enfoque de Equipo Cardíaco. Además, subraya el valor de las segundas opiniones exigidas por las compañías de seguros para proteger a los pacientes de intervenciones injustificadas. Para

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#### Abbreviations:

AI = Aortic Insufficiency  
 AS = Aortic Stenosis  
 CAD = Coronary Artery Disease  
 LVEF = Left Ventricular Ejection Fraction  
 LVESD = Left Ventricular End-Systolic Dimension  
 LVH = Left Ventricular Hypertrophy  
 NYHA = New York Heart Association  
 SAVR = Surgical Aortic Valve Replacement  
 TAVR = Transcatheter Aortic Valve Replacement  
 VHD = Valvular Heart Disease

**A**ortic valve replacement is the second most common cardiac operation in the adult population in the Western world, primarily due to aortic stenosis. From a practical standpoint, the common indications for aortic valve surgery are as follows:

Below is a summarized overview of the surgical indications for aortic valve replacement (SAVR) in cases of aortic insufficiency and aortic stenosis, based on recent clinical practice guidelines.<sup>1,2</sup>

### Aortic insufficiency

The surgical indications for aortic valve replacement in cases of aortic insufficiency (AI) include:

1. Symptoms: patients with worsening symptoms such as dyspnea, angina, or syncope should be considered for surgery, especially if they are classified as NYHA (New York Heart Association) functional class II or higher.
2. Left ventricular dilation or dysfunction:
  - a. Surgery is recommended if the left ventricular ejection fraction (LVEF) falls below 60%.
  - b. A left ventricular end-systolic dimension (LVESD) greater than 50 mm indicates the need for intervention.
3. Acute aortic insufficiency: immediate surgical intervention is indicated in cases of acute severe AI due to conditions such as aortic dissection or infective endocarditis.
4. Other factors: consideration should also be given to patients with progressive aortic regurgitation, significant worsening of symptoms, or a rapid decline in left ventricular function.

### Aortic stenosis

The surgical indications for aortic valve replacement in cases of aortic stenosis (AS) include:

*garantizar la selección adecuada de los pacientes y el cumplimiento de las mejores prácticas, existe una necesidad apremiante de una defensa más amplia de los Equipos Cardíacos multidisciplinares dentro de las organizaciones quirúrgicas acreditadas.*

**Palabras clave:** reemplazo valvular aórtico, cirugía cardíaca, reemplazo valvular aórtico transcathéter, Equipo Cardíaco, válvula aórtica.

1. Symptoms: patients who exhibit symptoms related to aortic stenosis (e.g., exertional dyspnea, angina, or syncope) should undergo valve replacement, typically when classified as NYHA functional class II or higher.
2. Severe aortic stenosis: surgical intervention is indicated in patients with a valve area of less than 1.0 cm<sup>2</sup>, particularly if they are symptomatic.
3. Asymptomatic patients: surgery may also be required in asymptomatic patients if:
  - a. The LVEF is less than 50%.
  - b. The peak aortic jet velocity is greater than 4.0 m/s.
  - c. Persistent left ventricular hypertrophy (LVH) is observed.
3. Other indications: patients undergoing other cardiac surgery (e.g., coronary artery bypass grafting) should have the aortic valve replaced if significant stenosis is present.

### CASE DESCRIPTION

We present this case report because the patient had already been scheduled to undergo a transcatheter aortic valve replacement (TAVR) without any clear indication for a valve procedure.

The patient was a 63-year-old asymptomatic male with a cardiovascular condition. He was evaluated after the discovery of a heart murmur during a routine medical check up in 2023. He was diagnosed with a bicuspid aortic valve with minimal insufficiency. One year later, in July 2024, after undergoing multiple follow-up studies, he was informed that the insufficiency had rapidly progressed to a moderate degree but had not yet caused ventricular dysfunction. He was advised that this was an ideal time to undergo TAVR, particularly because it is a minimally invasive procedure with immediate recovery. The patient was surprised by the diagnosis but did not question the recommendation.

The insurance company's policy required a second opinion for conditions that involved major medical expenses. The patient visited the private hospital, consulted the medical directory, selected a cardiologist's name, and scheduled an appointment with a physician from our multidisciplinary team.

He underwent a stress echocardiogram with a cycle ergometer, which revealed the following findings: the test was stopped due to fatigue at 15 minutes after reaching 85% of the maximum heart rate for his age, with 143 watts of

resistance and 60 RPM. At peak heart rate, there were no signs of segmental contractility alterations suggestive of ischemia or myocardial injury, nor were there electrocardiographic abnormalities. Pulmonary artery pressure during peak exertion was estimated at 40 mmHg, with an oxygen saturation of 98%, and he exhibited a hypertensive response that resolved after the test. The aortic valve was bicuspid with a mild double aortic lesion, predominantly insufficiency, with an AVA of 1.8 cm<sup>2</sup>, a mean gradient of 8 mmHg, and a Vmax of 1.9.

The case was presented at a Heart Team session, where three surgeons qualified for transcatheter implantation evaluated the patient. He was started on antihypertensive therapy and advised to continue his normal life. Appropriate preventive measures were recommended to reduce the risk of infections due to the valve's morphology, and he was scheduled for clinical surveillance and follow-up in one year.

## COMMENT

As demonstrated earlier, the patient presents a typical case of bicuspid aortic valve with a double lesion characterized by predominant insufficiency. Notably, the patient remains asymptomatic and does not meet any criteria for intervention. In the introduction to this document, we outlined the surgical indications for aortic valve surgery, encompassing the criteria for transcatheter valve replacement.<sup>1,2</sup> Indeed, the incidental detection of a moderate, asymptomatic, bicuspid aortic valve with predominant regurgitation in a patient does not align with established indications for TAVR.

Had this patient initially been presented to a "Heart Team", he probably would not have been scheduled for transcatheter implantation or any other procedure. In most academic settings, patients are only presented at "Heart Team case presentations" or "medical-surgical sessions" when the natural history of the disease progresses to such a state where an intervention is considered; which is not the present case. However, due to the growing number of "off label" cases that we are observing, we considered it quite pertinent to write and discuss this case report. Similarly, if the insurance company had not required a second opinion (as is the case with most companies), the patient would have already undergone an unnecessary procedure. It is a fact that the statement: *"We do not need to perform an open heart operation anymore, now we can fix your heart valve with a single stick in your groin and you will be discharged home the next morning"*, has moved patients with SAVR/TAVR borderline indications to decide towards TAVR; even in an "off label" setting.

The Heart Team plays a pivotal role in the management of valvular heart disease (VHD) in centers with access to

both conventional surgical and percutaneous interventions. Current guidelines emphasize the importance of Heart Team participation, with a class I recommendation, level of evidence B-NR, in the context of coronary artery disease (CAD),<sup>3</sup> and a class I recommendation, level of evidence C, in the 2020 ACC/AHA American guidelines for VHD.<sup>1</sup>

Probably, this case could not be an isolated incident, and many readers may have encountered similar scenarios. However, authors strongly advocate that, as a collective professional body, we should promote the development of multidisciplinary teams that foster collaborative decision-making. This should involve partnerships with medical directors from insurance companies, as well as accreditation from recognized Mexican surgical organizations.

## CONCLUSIONS

The increasing availability and minimally invasive nature of TAVR have led to its use in borderline and even inappropriate cases. This case highlights the need for structured decision-making involving a Heart Team to ensure guideline-based management and avoid unnecessary procedures. It also suggests the role of medical insurance policies in encouraging second opinions, which may protect patients from inappropriate interventions. Greater advocacy for multidisciplinary Heart Teams within accredited surgical organizations is essential to uphold best practices in valvular heart disease management.

## REFERENCES

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