

EDITORIAL COMMENT

Is TAVR Preferred in Patients With Prior Chest-Directed Radiation Therapy?



Consider 5 Key Factors*

Gilbert H.L. Tang, MD, MSc, MBA, Mohamad Abdullah, MD, PhD

Advances in the management of valvular heart disease have provided less invasive options for sicker patients. Understanding the precise intervention risk is a cornerstone to guide informed decisions and individualized treatment plans. This applies to management of calcific aortic stenosis (AS) in patients with prior chest-directed radiation therapy (CRT).

WHAT ARE THE CARDIAC SURGICAL RISKS IN PATIENTS WITH PRIOR CRT?

It is well known that in patients with severe aortic stenosis undergoing surgical aortic valve replacement (SAVR), patients with prior chest radiation have significantly worse long-term survival (1). The radiation-associated heart disease may involve any cardiac structure, including the pericardium, myocardium, valvular system, conduction system, and coronary arteries. Great vessels and lungs may also be involved. Moreover, fibrosis of the surrounding tissues and adhesions introduce more surgical challenges. Also, patients who have undergone radiation frequently develop pulmonary complications at the time of surgery due to multiple factors, including restrictive lung disease and radiation-induced pleural effusion, which are further complicated by open heart surgery.

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From the Department of Cardiovascular Surgery, Mount Sinai Health System, New York, New York, USA.

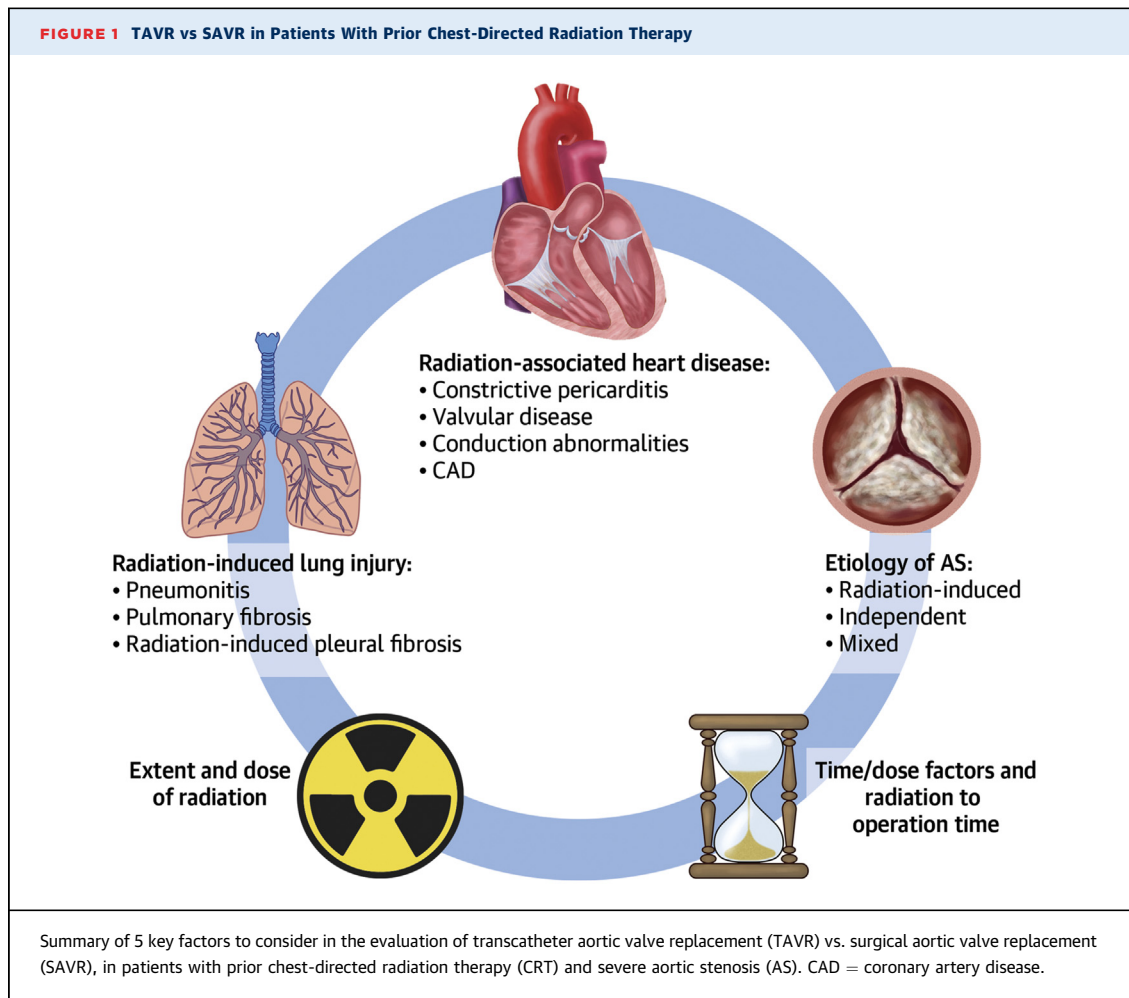
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TAVR WAS ASSOCIATED WITH BETTER SURVIVAL WHEN COMPARED WITH SAVR IN INTERMEDIATE-/HIGH-SURGICAL RISK PATIENTS WITH PRIOR CRT

In this issue of *JACC: CardioOncology*, Yazdchi et al (2) studied the outcomes of transcatheter aortic valve replacement (TAVR) versus SAVR in patients with prior CRT. Although TAVR patients were older and had more comorbidities, they had lower operative mortality. However, most of the SAVR deaths occurred only in the intermediate-/high-risk group. The observed-to-expected mortality ratio was lower in all TAVR and low-risk SAVR patients. Patients who had undergone SAVR had longer intensive care unit and hospital stay and higher blood transfusion requirement, but comparable rates of new permanent pacemaker implantation and permanent stroke. The study was well conducted, and the authors should be commended for their effort to provide safety profiles of different intervention modalities for management of AS in this unique group of patients.

FACTORS INFLUENCING TAVR VERSUS SAVR IN PATIENTS WITH PRIOR CRT

We feel that 5 key considerations should be taken into account to when classifying patients with AS and prior CRT (Figure 1). First, radiation exposure is heterogenous. Variable radiation dose and subsequent organ dysfunction risk can impact clinical outcomes. As such, standard preoperative risk calculators, which do not account for such parameters, may not have predictive utility in this patient subset. Second, the extent of radiation, including the radiation field, dose, and radiation to operation time interval can each influence the extent of tissue damage. Third, the burden of radiation-associated heart



disease can be determined using cardiac structural, functional, and physiological parameters, such as left and right ventricular systolic and diastolic function, intracardiac pressure and tissue characterization, pericardial constriction, intervalvular fibrous body calcification, or aorto-mitral curtain thickness, the latter of which has been found to be an independent predictor of mortality in this patient population (3). Similarly, increasing pulmonary fibrosis using multi-detector chest computed tomography is associated with increased mortality (4). Fourth, additional considerations include whether the patients received additional cancer therapy, especially known cardiotoxic regimens (including anthracyclines or trastuzumab). Fifth, efforts should be made to define the etiology of aortic valve disease in each patient: whether it is due to radiation-induced inflammation, an independent cause, or a mixed picture (especially in elderly patients).

Notwithstanding these factors in evaluating patients with prior CRT for aortic valve intervention, the authors have shed new light on this topic, so that better patient-centered care can be provided to these medically and anatomically complex patients. We are grateful to the authors for this work.

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ADDRESS FOR CORRESPONDENCE: Dr Gilbert Tang, Department of Cardiovascular Surgery, Mount Sinai Health System, 1190 Fifth Avenue, GP2W, Box 1028, New York, New York 10029, USA. E-mail: gilbert.tang@m MountSinai.org. Twitter: [@GilbertTangMD](https://twitter.com/GilbertTangMD).

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