Tricuspid valve regurgitation

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IMPACT
Tricuspid regurgitation (TR) is a frequent condition that has been overlooked compared to left-sided valve diseases. Epidemiological studies suggest that moderate or severe TR affects over 1.6 million individuals in the USA. (1, 2). Multiple studies, in various settings such as heart failure (HF) with reduced left ventricular ejection fraction (LVEF), tricuspid flail, or isolated functional TR, have shown that the presence and severity of TR are associated with an increased risk of mortality and of cardiovascular (CV) events (3-8).

Although total numbers had increased over time, TV surgery remained seldom performed, and mainly concomitant with another surgical procedure and rarely isolated. TR is often left untreated. Intervention (surgery or transcatheter) is the only curative treatment for severe TR and medical therapy should be considered as only palliative.

The main objectives of this thesis were: to analyze the prognostic role of the tricuspid regurgitation, to evaluate the results of the surgical treatment in various setting; to assess the interplay between tricuspid regurgitation and right ventricle. In this chapter clinical and surgical impact of the thesis is reported.

Clinical Impact

The first part of this thesis (Chapter 2) describes the prognostic role of untreated functional tricuspid regurgitation (TR), graded moderate or severe, at the time of mitral valve surgery. Particularly, the study confirmed that leaving untreated functional tricuspid regurgitation, it may worsen over time. The study was performed in period when most of surgeons still embraced the concept that treating mitral valve disease could solve also secondary tricuspid regurgitation. This retrospective study endorsed the incoming thought that a more aggressive and prophylactic approach had to be taken in order to stabilize also function tricuspid regurgitation.

This is followed by a comprehensive dissertation on functional tricuspid regurgitation (Chapter 3), starting from anatomy to pathophysiological mechanisms, from clinical
presentation to imaging, from prognostic role and surgical indication to surgical outcome, summarizing factors that can impact on worsening of tricuspid regurgitation whenever surgeon decides to leave it untreated, or on durability of tricuspid valve repair.

In Chapter 4, the additive and independent prognostic role of right ventricle and pulmonary pressure in mitral-tricuspid surgery has been investigated. The interplay between these two variables and function tricuspid regurgitation is nowadays well recognized, so that even less than severe tricuspid regurgitation are recommended to be operated on in presence of abnormal right ventricular size and function as well as in case of pulmonary hypertension. In this retrospective study, the prognostic role of either right ventricular size/function or pulmonary hypertension has been confirmed at multivariable analysis, supporting the thesis that, in mitral-tricuspid surgery, pulmonary hypertension per se cannot mirror necessarily a right ventricular remodeling and vice versa, so both variables should be included in the risk models, either independently or as adding risk features.

**Surgical impact**

In Chapter 5, another interesting issue was addressed, the very long-term outcome of patients with isolated tricuspid regurgitation due to infective endocarditis. In the literature, small sized experiences are reported, so this retrospective study, extrapolated from INFECT-REGISTRY, the The ItaliaN registry For surgical trEatment of valve and prosthesis infeCtive endocarditis, reported one of the largest series ever reported. The reported results were satisfactory either in terms of early and late outcomes. Preoperative patient profile and disease features may identify patients at higher risk for less favorable prognosis, such as elderly, redo and intravenous drug user. This issue was then argued also in the chapter 7, where we compared two surgical approaches, repair or replacement, showing no difference in terms of both early and late outcome.
In the chapter 6, a network meta-analysis of 31 studies was performed to compared four different approaches to functional tricuspid regurgitation, leaving untreated compared to suture annuloplasty, flexible ring or rigid ring implant. We provided so a summarizing picture of the main studies, randomized, propensity matched or unmatched on this issue, so to find the best approach. Our results confirmed the need to treat even less than severe functional TR as well as the need to use a prosthetic ring rather than suture annuloplasty. Moreover, in case of ring implant, a semirigid or rigid one should be preferable to achieve a longer stability of the repair.

REFERENCES
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