bypass, concomitant procedures, hypothermia, postoperative blood loss, and preoperative and postoperative drugs. Worthy of note is the greatest incidence of reoperation for bleeding (20%) and the lowest minimum corrected PTL count ($38 \times 10^3/\mu\text{L}$) in the Perceval S compared with the other bioprostheses. Due to the small sample size, the authors failed to find any statistical difference among the groups; however, the absence of evidence is not evidence of absence and therefore a correlation between early thrombocytopenia after Perceval S implant and severe bleeding should be speculated. The early thrombocytopenia after Perceval S implant is always behind the corner, and the mystery^{10,11} continues.

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Commentary: Thrombocytopenia yes...thrombocytopenia no...that is the question

Antonio Miceli, MD, PhD

Thrombocytopenia after cardiopulmonary bypass is a transient and common event in cardiac surgery, mainly secondary to hemodilution, platelet consumption, and perioperative blood loss. It usually occurs between the second and third postoperative days, resulting in a reduction

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CENTRAL MESSAGE

Thrombocytopenia is a transient and multifactorial phenomenon in the absence of clinical complications. Mechanical stress induced by oversizing may be a potential cause of thrombocytopenia.

of platelet counts by 30% to 60% from baseline values.^{1,2} Small retrospective studies have concluded that the Perceval sutureless valve (LivaNova PLC, London, United Kingdom) is associated with a lower platelet

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count compared with other prosthetic valve.^{3,4} Except in some cases of platelet transfusion, thrombocytopenia was never associated with poor outcomes.³⁻⁶ In this issue of the *Journal*, Stegmeier and colleagues⁷ confirm that the Perceval valve is associated with a higher risk of thrombocytopenia relative to 2 different porcine valves. Similar to findings in other studies, however, no differences were found in terms of blood loss, transfusion, or rates of reoperation for bleeding.

The Perceval S valve (LivaNova) is new generation bovine pericardium prosthesis and is considered the evolution of the Freedom SOLO (LivaNova) stentless valve, which has been often associated with postoperative thrombocytopenia. Previously, my group showed that patients receiving the Freedom SOLO valve had a greater probability of platelet count reduction in the first 5 postoperative days.⁸ We also found higher mean platelet volume and platelet distribution width compared to other prosthetic valves, indicating possible platelet activation. Jiritano and associates³ reported similar results with the Perceval valve, intuiting a common potential mechanism between SOLO and Perceval valve. Several hypotheses have been formulated but never investigated. The storage solution, the microhemodynamic effect of the prosthesis, or the naked alloy stent of the Perceval S valve might induce platelet activation and thrombocytopenia.² Mechanical stress induced by oversizing might be another potential cause of drop in platelet count. The Perceval valve is an expandable prosthesis, and it has been designed with its internal diameter that adapts in size to the patient's true annular size. Oversizing causes suboptimal expansion of the valve and results in high gradients. In borderline cases, when the annulus is between sizes, LivaNova recommends considering the overall dimension of the aortic root (sinuses and sinotubular junction diameter) and dividing the sinotubular junction diameter by 1.3 to identify the smallest implantable size.⁹ In this regard, Stegmeier and colleagues⁷ have reported neither hemodynamic performances nor how

sizing was performed. Identification of a relationship between high gradients and thrombocytopenia might be helpful in solving this mysterious problem.

Thrombocytopenia is complex and multifactorial, and a recent metanalysis has shown that it is common in all patients undergoing biologic valve implantation, regardless of prosthesis type (including transcatheter aortic valve implantation).¹⁰ Although the Perceval valve appears to be associated with a higher drop in platelet count, we know that thrombocytopenia is transient without any clinical complications. A well-designed study is required to investigate this phenomenon.

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