Dreaming with a broken heart: the importance of Takotsubo cardiomyopathy as a perioperative etiology of anesthetic-related cardiopulmonary dysfunction

Medical literature often refers to rare disorders as zebras [1], but in the recent paper by Varutti et al. [2] regarding a rare etiology of perioperative hemodynamic dysfunction, the disease name, Takotsubo, is translated from the Japanese as “Octopus Trap” [3]. This maritime nomenclature is not due to the disease’s rare incidence within perioperative settings, but is a description of the shape the heart conforms to, with resulting cardiopulmonary instability. Not only is the inclusion of Takotsubo cardiomyopathy within the anesthesiologists’ differential diagnosis important, but also the addition of a novel potential etiology for this disease represents an important contribution to the medical literature.

Maintaining an extensive differential diagnosis list is even more important when the patient presenting with symptoms is considered low-risk by history, but is scheduled to undergo a non-cardiac procedure. The determination as to the risk profile of a patient for perioperative cardiac events during scheduled non-cardiac surgery can be made using the guidelines published by the Journal of The American College of Cardiology, with the most recent update having been published in December 2014 [4]. Given the preoperative history and test results of the patient described in the current report, the anesthesiologist who referred to the guidelines would have had decreased suspicion for the eventual postoperative course of this patient.

The postoperative course observed in the setting of ECG changes and increased plasma levels of troponin I point to a potential acute coronary syndrome [5]. Takotsubo cardiomyopathy has been estimated to represent 1-2% of patients with suspected acute coronary syndrome in the cardiology literature [6]. The most common symptom is chest pain, observed in 70-90% of patients, with dyspnea and pulmonary edema seen less commonly [6]. Stress, whether psychological or emotional, typically occurs in conjunction with the symptoms, leading to the alternative description of the disease as “broken-heart syndrome” [7]. Other potential etiologies have focused on sudden and massive catecholamine release leading to coronary artery spasm, tachycardia, ST segment depression and hypertension (the “catecholamine heart” syndrome).

While many potential pathophysiological mechanisms have been described, no definitive pathophysiological mechanism has yet been determined. Proposed mechanisms include multi-vessel epicardial coronary spasm, coronary endothelial dysfunction, catecholamine cardiotoxicity, and neurogenic stunned myocardium [3, 8]. The lack of definitive mechanism combined with masquerading symptoms can make the diagnosis within the perioperative period challenging. Perioperative Takotsubo cardiomyopathy has been described in the preoperative, intraoperative, and postoperative periods, associated with both emotional and iatrogenic catecholamine surges with surgery or the anticipation thereof [9].

The excellence and clinical utility of this case report stem from several facets of the presentation. The entire arc of the patient’s course, ranging from hemodynamic stability intraoperatively to deterioration postoperatively, is presented with completeness and attention to detail. A thorough overview of the diagnostic and treatment methodologies in the literature are described. In this report [2], the authors describe a favorable approach to clinical management – stabilization of cardiopulmonary status followed by immediate
interrogation via cardiac echocardiography and coronary angiography, which has been described as the “best single tool” for diagnosis of Takotsubo cardiomyopathy [8]. The proposed triggering mechanisms of intraoperative fluid overload and hypertensive crisis are novel within the literature. Alternative explanations, such as the effect of pneumoperitoneum on blood catecholamine levels, are presented for the reader’s consideration.

In conclusion, the report meets one of the seminal criteria proposed in a recent Anesthesia & Analgesia editorial by Hessel and London [10] as to what is needed in the medical literature to help answer unresolved questions regarding rare case reports: the manuscript [2] proposes a previously undescribed potential etiology of this rare, yet well-established perioperative syndrome.

References

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