Preoperative Evaluation and Perioperative Complications in Patients with Cancer and Ventricular Dysfunction

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During cancer treatment, surgery may be indicated for patients with diverse purposes, such as diagnosis, staging, oncologic cure, palliative treatment, support, or restorative treatment. Oncologic surgery may be conducted as an initial cancer treatment or after conducting treatments such as chemotherapy or radiotherapy, thus underscoring the cardiotoxic potential of different cancer therapies.[1]

In patients undergoing non-cardiac surgeries, the prevalence of comorbidities, the clinical condition before surgery, and factors inherent to the surgical procedure, such as urgency, magnitude, type, and duration, in addition to local experience, infrastructure, and the surgical team contribute to the risk of perioperative complications.[2] In oncologic surgery, risk factors include the type and stage of the tumor and concomitant cancer therapies.

It is worth emphasizing that there is a shortage of robust evidence, such as randomized clinical trials, to validate the indications of the main guidelines for evaluation and perioperative management of non-cardiac surgeries, and this scenario is more evident when dealing with oncologic surgeries.[2,3]

Preoperative clinical evaluation before oncologic surgery is important; however, it should not delay the surgical procedure. In this context, cardio-oncology plays a role in minimizing risks, but it avoids depriving patients of the indicated cancer treatment, in this case surgery. In rare situations, when facing a high surgical risk, it is possible to discuss with the oncologist whether a non-surgical treatment option that also offers improved prognosis is available.

In recent decades, several preoperative risk scores have been developed, and they have been used in the preoperative assessment of patients undergoing non-cardiac surgery.[4-6] However, it is evident that there is a low representation of patients with cancer in the studies that validated these clinical scores, in addition to a small number of studies that have evaluated surgeries for specific tumors. Recently, the Heart Failure Association and the International Cardio-Oncology Society proposed an instrument for assessing cardiac risk in cancer treatment based on clinical and laboratory factors, in addition to previous cardiotoxic treatments performed.[7]

In patients with cancer, aspects such as frailty and performance status may represent relevant aspects in the preoperative assessment of patients, and scores that specifically assess them may be useful.[3,8,9]

Ventricular dysfunction is a risk factor for the occurrence of peri- and postoperative complications, and it can occur due to different causes at all ages. This condition increases the morbidity and mortality associated with the surgical procedure.[10] Surgical procedures have the potential to aggravate this underlying condition. This can be avoided by implementing appropriate risk stratification before surgery and optimizing perioperative therapy with the adoption of measures recommended in heart failure guidelines.[11]

Tests such as electrocardiogram, echocardiogram, and biomarkers assist in the preoperative evaluation and postoperative management of patients with ventricular dysfunction.[12] Other tests, such as those associated with stress, magnetic resonance imaging, tomography, or even coronary angiography, should only be performed in an exceptional, individualized manner and in contexts where they can potentially modify the cardiological or oncological practice, thus avoiding delays in surgery or unnecessary emotional stress for patients.

It is recommended to control risk and lifestyle factors, such as smoking, obesity, blood pressure management, diabetes, and dyslipidemia, for all patients with the aim of reducing peri- and postoperative complications.[7]

The type of anesthesia and the drugs used during anesthesia warrant attention in patients with ventricular dysfunction. Volume and perfusion status should be assessed regularly. A multidisciplinary team with specialists in ventricular assist devices must necessarily be involved in the perioperative management of patients who require mechanical circulatory support.

Rhythm and conduction disorders may be present in patients with ventricular dysfunction who are undergoing surgery. During preoperative evaluation, it is necessary to consider the risk of symptomatic bradyarrhythmias and the need for artificial cardiac stimulation (transvenous and/or transcutaneous pacemaker). Patients with cancer are also

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susceptible to tachyarrhythmias, especially supraventricular ones. Special mention should be made of cardiac arrhythmias during the postoperative period in these patients, especially atrial fibrillation and thromboembolic events. Specific aspects should be taken into account in the management of these complications, such as drug interactions and risk of bleeding, mainly related to the medications in use, tumor type and stage, and comorbidities.[13]

The surgical technique can influence patient outcomes; therefore, in patients with cancer and ventricular dysfunction, if possible, priority is given to using less invasive techniques and performing surgical procedures with a team and center experienced in oncologic surgery and high-risk patients. These measures aim to optimize the surgical result by reducing the chances of prolonging the surgical procedure or unnecessary additional procedures.

Patient participation in decision-making is recommended, but unfortunately studies have indicated a relatively high prevalence of limited level of schooling in patients with cardiovascular diseases, especially heart failure,[14] which is associated with worse outcomes.[15] It is, therefore, evident that specific actions are needed for these patients when undergoing oncologic surgery, so that they are aware of the risk-benefit ratio of the available therapeutic options.

The occurrence of various postoperative complications is increased both in patients with cancer and in patients with ventricular dysfunction. In the presence of heart failure, with or without symptoms, even minor postoperative complications may be poorly tolerated, reducing medium- and long-term survival.[16]

The organization of multidisciplinary cardio-oncology services makes possible the global and individualized assessment of patients with ventricular dysfunction who are candidates for oncologic surgery, and it optimizes pre-, peri- and postoperative management by implementing practices based on specific guidelines for this context.[17]

It is, therefore, worth emphasizing the need for further studies in patients with cancer and ventricular dysfunction in specific clinical scenarios related to tumor type and stage. Only in this way will it be possible to base clinical practice on more robust evidence than that which is currently available for the management of these patients.

Author Contributions

Conception and design of the research: Issa AC; Acquisition of data: Issa AC, Zagni G, Vidotti V; Analysis and interpretation of the data: Issa AC, Guimarães T; Writing of the manuscript: Issa AC, Vidotti V, Santos M; Critical revision of the manuscript for important intellectual content: Issa AC, Zagni G, Vidotti V, Guimarães T, Santos M, Silva CMPDC.

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