Appendix 1

Case

At the Montreal General Hospital many patients go through our prehabilitation program, typically for a minimum of four weeks, and achieve significant improvement in modifiable risk factors and measurable parameters of fitness [e.g., Duke Activity Status Index (DASI), cardiopulmonary exercise testing (CPET) parameters, HbA1c]. They then proceed with surgery according to our institutional enhanced recovery after surgery (ERAS) pathways starting from a much better baseline than they were before their prehabilitation assessment and program. The following case highlights a different scenario which illustrates how implementation of a prehabilitation program may be used to inform perioperative decision making in challenging patients.

A 79-year-old male patient with a 30-pack year active smoking history presented with a right upper lobe cancer for a video-assisted thoracoscopic surgery (VATS) lobectomy. His medical history was notable for type 2 diabetes on oral agents, coronary artery disease with several stents, atrial fibrillation and hypertension. He had moderate chronic obstructive pulmonary disease (COPD) by gold criteria as well as chronic kidney disease with an estimated glomerular filtration rate (eGFR) of 31 mL/min per 1.73 m^2 and multifactorial anemia. His brain natriuretic peptide levels were 162 pg/mL. He had a 6-minute walk distance of only 210 m and reported a very poor DASI of 10.75. He had lost weight since his diagnosis and had appetite issues. He was deemed to be at very high perioperative risk.

Because of these findings he was referred for prehabilitation prior to surgery. His assessment revealed a predictably low VO_2 peak of 9.9 mL/kg/min and he was severely malnourished as per the patient-generated subjective global assessment (PG-SGA) score. His intervention consisted of a combined aerobic and resistance exercise program along with inspiratory muscle training, increased caloric intake with protein supplementation and intravenous (IV) iron infusion.

Unfortunately, despite participating in the program, on reassessment this patient did not demonstrate an improvement. This information was reviewed with the interdisciplinary team including surgery, oncology, anesthesia and of course the patient and their family, leading to the decision to proceed with stereotactic body radiotherapy as an alternative to lung resection in this patient. While the goal of prehabilitation is to improve perioperative outcomes, this case highlights how the thorough assessment and response to prehabilitation can also be used to inform decisions about patient care trajectories.

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