

Electroconvulsive Therapy for a Patient with a Penetrating Ulcer in the Aortic Arch

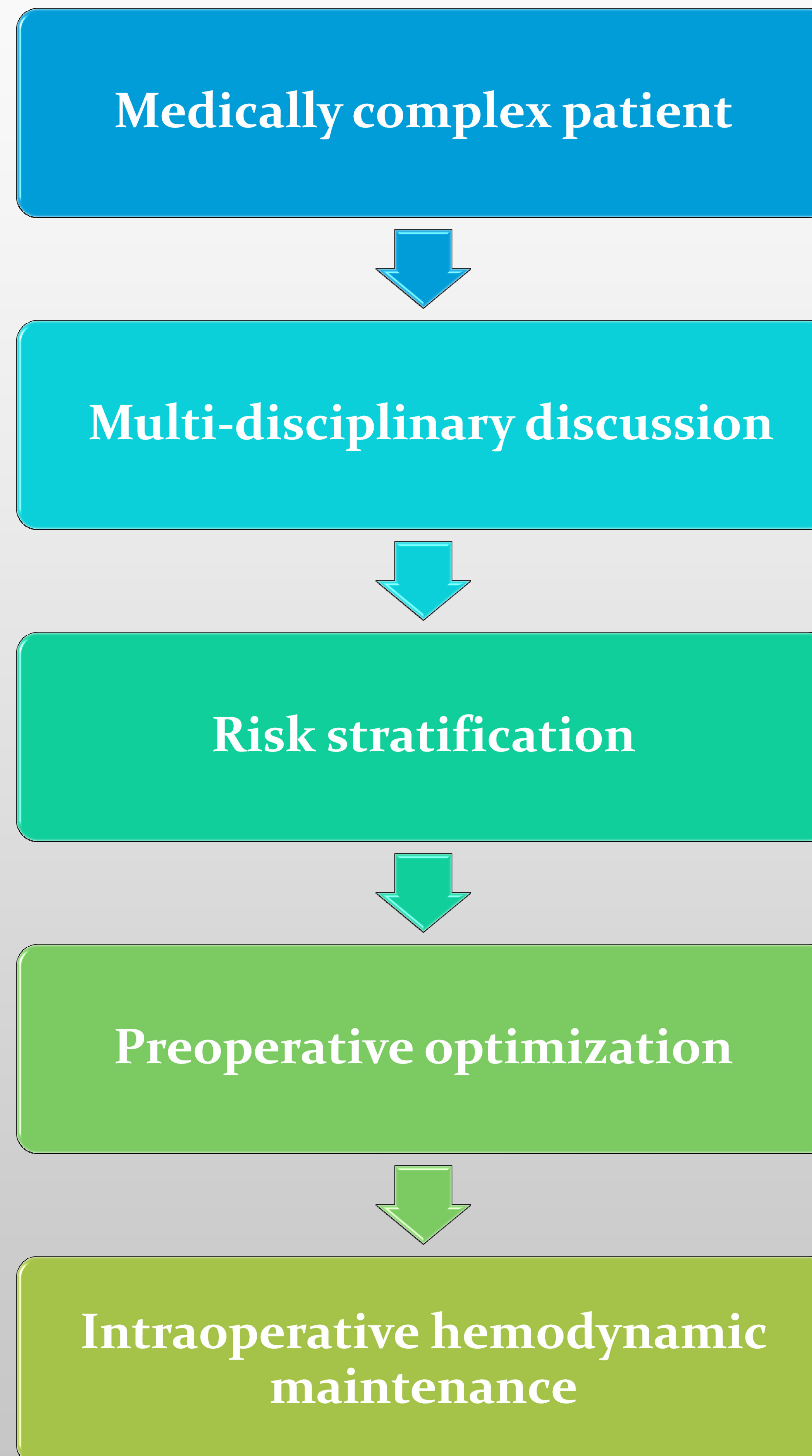
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Case: An 85 year-old male presented with major depressive disorder refractory to medical therapy. A series of eight electroconvulsive therapy (ECT) was planned. Past medical history includes a small penetrating ulcer in the aortic arch, an ascending aortic aneurysm measuring 4.3 x 4.4 cm, atrial fibrillation on anticoagulation and hypertension. Medications include metoprolol, coumadin, simvastatin, alprazolam and venlafaxine.

In light of the complex cardiac history, hemodynamic changes associated with ECT, albeit brief, may lead to complications including an increase in the size of aneurysm, rupture of aneurysm or aortic perforation. Although the patient had episodes of sustained blood pressures greater than 160mmHg secondary to pain and during recent hip surgery, he did not have any cardiac symptoms or events. Since then his blood pressure had been better controlled. After a multi-disciplinary discussion with the cardiologist, the psychiatrist, and the anesthesiologist regarding risks and benefits of ECT, the patient consented to therapy. The consensus among the team members was that the benefits of ECT, i.e. mental wellness and a better quality of life, outweigh the risks associated with the procedure.

For the ECT treatment, we induced general anesthesia with etomidate and succinylcholine with standard ASA monitors. Intra-operative beta-blocker therapy with labetalol was administered and positive pressure mask ventilation with 100% oxygen. Bifrontal electrodes were applied and electroconvulsive shocks were administered, yielding an average of 30 seconds of generalized seizure. A series of eight ECT sessions were performed in a similar manner without significant hemodynamic changes. He recovered from general anesthesia and ECT-induced seizures without incident. At the conclusion of therapy the patient had significant improvement of mental well-being and was discharged home.



Discussion: A penetrating aortic ulcer refers to an ulceration of an atheromatous plaque which extends deeply through the intima into the aortic media. Typically, the patient is elderly and has comorbidities of hypertension, dyslipidemia, atherosclerosis and abdominal aortic aneurysms.³ Complications include development of localized intramural hematoma secondary to erosion of aortic vasa vasorum by the ulcer, pseudoaneurysm formation, progression to overt dissection or rupture in up to 40% of patients.^{1, 2, 3}

Therefore, the possibility of hemodynamic instability during ECT treatment was concerning to our patient. During ECT, electroshocks delivered induce seizures lasting 30-60 seconds.⁵ In response to the electroshock, a catecholamine surge occurs which results in transient increase of blood pressure, heart rate and cardiac output.^{4, 5} The fluctuation of hemodynamics can lead to complications as noted above. Thus, ECT was relatively contraindicated in our patient.

However, during the patient's hospital stay, his depression worsened with psychotic features. At this point, the benefits from ECT outweighed the risks, and the focus thus shifted to peri-operative medical optimization to minimize the risks involved with ECT. Fortunately, with peri-operative as well as intraoperative institution of beta-blocker therapy, the patient tolerated the series of ECT treatments well and his mental well-being also improved dramatically.

In conclusion, this case illustrates the safety and efficacy of ECT even in a high-risk patient in whom ECT is relatively contra-indicated. A multi-disciplinary discussion could also help a medically complex patients to make an informed decision and optimize peri-operative management. The case highlights the critical role of the anesthesia personnel in monitoring and maintaining hemodynamics and ensuring the safety and well-being of high-risk patients. As the aging population grows and the number of high risk patients rises, anesthesia services may also become increasing important in determining favorable patient outcome.

References:

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