Anterior Mediastinal Mass: Anesthetic Management and CBP Effects

Cantor D, Fitzsimons M
Mgh, Boston, MA, USA

Introduction: Management of patients with anterior mediastinal masses presents a unique and often unpredictable challenge to the anesthesiologist. Induction of anesthesia can result in both cardiovascular and respiratory embarrassment and even complete cardiovascular collapse. We present the management for the resection of an anterior mediastinal mass causing RVOT obstruction and its implications on CPB.

Case Presentation: A 40-year-old male with a PMH of HTN presented for resection of a large anterior mediastinal mass. His chief complaint was of dry cough. A chest CT demonstrated a 17.5 x 15.2 x 9.7 cm mass in the anterior mediastinum compressing the RVOT, SVC, and great vessels. A TTE showed the mass compressing the RVOT, causing a peak RVOT gradient of 37 mm Hg and a 22 mm Hg mean gradient. Prior to induction, IV access and a radial arterial line were placed in the right upper extremity, as was a triple lumen central venous catheter in the right IJ. Femoral arterial and venous access were established for emergent CPB in case of cardiac collapse. After induction with etomidate and fentanyl and successful mask ventilation, vecuronium was given, and the patient was intubated. Cerebral oximetry was monitored in case of hypothermic circulatory arrest. Initiation of warm CPB was complicated by difficulty in achieving adequate pump flow, and cerebral oximetry values declined from 69% to a nadir of 5% over 30 minutes. Neck flexion relieved the obstruction and cerebral oximetry returned to baseline.

After successfully weaning off CPB, TEE demonstrated normal anatomy with resolution of the RVOT obstruction. The post-CBP period was complicated by a consumptive coagulopathy. A total of 15 units pRBCs, 14 units FFP, 20 units of cryoprecipitate, 1080 units of factor IX, and 36 units of platelets were transfused. The patient had an uneventful post-operative course. A TTE one month post-operatively demonstrated normal systolic function and a trans-pulmonic valve gradient of 5 mm Hg.

Discussion: Much attention is appropriately directed to the induction of anesthesia for patients with anterior mediastinal masses. There are no current guidelines for management of these patients, although local protocols have been published. In concordance with recent data suggesting that perioperative cardiorespiratory complications is best predicted by presence of severe signs and symptoms of cardiorespiratory obstruction, our patient, who was essentially asymptomatic, had an uneventful induction of anesthesia and no post-operative cardiopulmonary complications. Interestingly, the patient tolerated the compression on his RVOT and SVC well until institution of CPB at which point his venous return became impaired. The patients SVC was almost obliterated by the tumor and additional stretch from neck extension may have led to impeded venous drainage, as mild neck flexion improved cerebral oximetry values. Our case demonstrates that anterior mediastinal masses can alter hemodynamics while on CPB and that a similar vigilance afforded to induction of anesthesia should be applied to initiation of CPB.

References:
3)Anesth 2004;100:826-34.