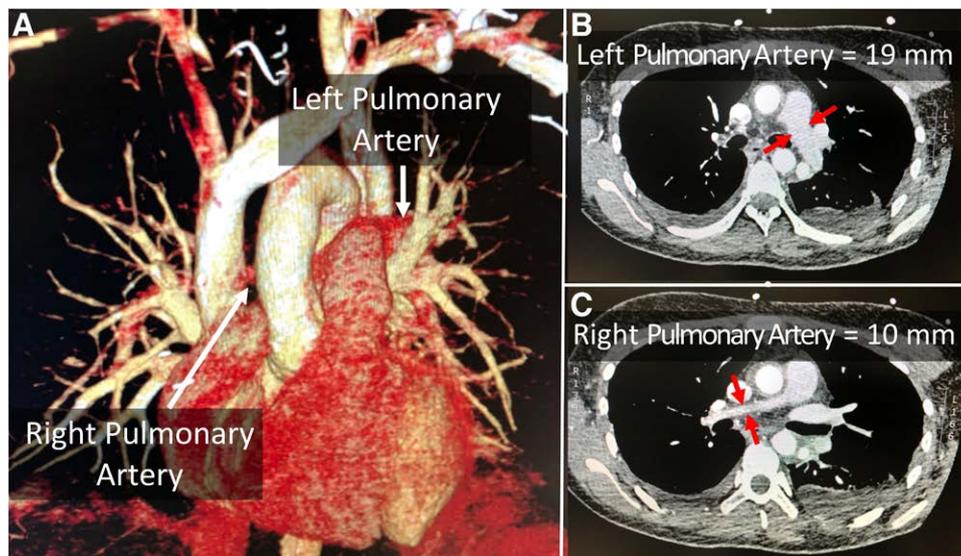


Dependent Lung Pulmonary Artery Hypoplasia as a Cause of Hypoxia during One-lung Ventilation

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Hypoxemia remains a well-described occurrence during one-lung ventilation.¹ We recently observed unexpected refractory hypoxemia during one-lung ventilation in a previously healthy nonsmoking 30-yr-old female undergoing left thoracotomy in the right lateral decubitus position to facilitate complex descending aorta to left subclavian/carotid artery bypass grafting to treat upper limb and cerebral ischemia resulting from Takayasu's arteritis. Despite endotracheal suctioning, reconfirmation of optimal bronchial blocker positioning, optimizing the fraction of inspired oxygen, and using both dependent lung positive end-expiratory pressure and nondependent lung continuous positive airway pressure,² the PaO_2 remained ~ 50 mmHg. No intracardiac shunt was seen on transesophageal echocardiography. Only intermittent two-lung ventilation temporarily corrected the hypoxemia. A postoperative computed tomography angiogram three-dimensional reconstruction (panel A) was performed to evaluate the vascular reconstruction and showed a hypoplastic right pulmonary artery (10 mm diameter; panel B) compared to a normal left pulmonary artery (19 mm diameter; panel C). We speculate that this hypoplasia resulted in enhanced shunting

to the nondependent, nonventilated lung; this is a previously unreported potential cause for one-lung ventilation hypoxemia. Although pulmonary hypoplasia is estimated to occur in only 1:200,000 of the population, consideration should be given to reviewing the routinely acquired preoperative computed tomography scan to assess for pulmonary artery size differential as a rare potential risk factor for hypoxemia during one-lung ventilation. If present, anticipation of an increased risk for hypoxemia should prompt rapid escalation of adjunct therapies (*i.e.*, positive end-expiratory pressure; continuous positive airway pressure; two-lung ventilation, with consideration to conversion of a thoracoscopic technique to open thoracotomy). Extracorporeal membrane oxygenation is also a potential option.

Competing Interests

The authors declare no competing interests.

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Published online first on February 16, 2021. From the Department of Anesthesiology, Perioperative and Pain Medicine (H.P.G., G.W.), and the Division of Cardiac Surgery, Department of Surgery (M.H.Y.), Max Rady College of Medicine, University of Manitoba, Winnipeg, Canada; and the Cardiac Sciences Program, St. Boniface Hospital, Winnipeg, Canada (M.H.Y.).

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