Obstetric Anaesthesia
Annual Scientific Meeting 2021 goes virtual
10-11 June 2021

A haemodynamic conundrum in pregnancy: severe aortic regurgitation secondary to a quadricuspid aortic valve complicated by severe pre-eclampsia

MW Gibbs, AM Oliveira*, LD Dougall, NL Fernandes
Department of Anaesthesia and Perioperative Medicine, University of Cape Town and Groote Schuur Hospital, Cape Town, South Africa
*New Somerset Hospital, Cape Town South Africa

Introduction

Aortic regurgitation is usually well tolerated in pregnancy.[1] However the large increase in afterload due to severe preeclampsia may result in acute cardiac failure in these patients. We present a case of a pregnant patient who had severe aortic regurgitation secondary to an undiagnosed quadricuspid aortic valve (QAV) complicated by severe preeclampsia.

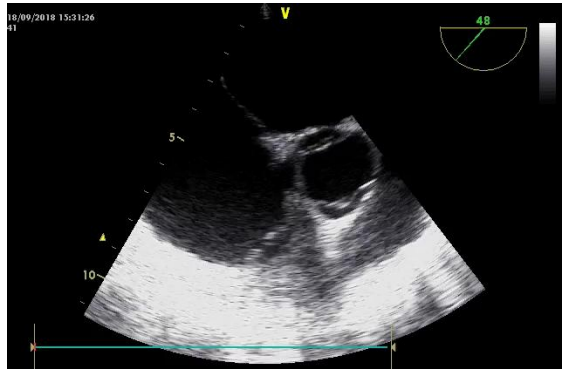
Case report

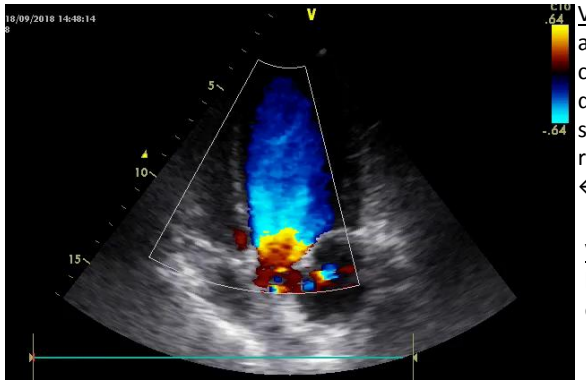
A 23 year old unbooked primigravida was admitted at a tertiary centre in South Africa at 27 weeks gestation with shortness of breath, bilateral pleural effusions, elevated blood pressure and proteinuria. Four days after initiating treatment for preeclampsia, the patient developed pulmonary oedema and required an emergency caesarean section for fetal distress. The managing anaesthetist, suspicious of an underlying cardiac lesion due to a collapsing pulse (heart rate 97/min) and a loud systolic cardiac murmur, performed a focused transthoracic echocardiogram (TTE) before induction of anaesthesia. The TTE showed moderate to severe aortic regurgitation, an ejection fraction of more than 60%, no regional wall motion abnormalities, mild tricuspid and mitral regurgitation and large bilateral pleural effusions.

General anaesthesia was commenced via modified rapid sequence induction. An intraoperative point-of-care transoesophageal echocardiogram (TOE) was performed which demonstrated an abnormal aortic valve with four cusps. Postoperatively, the patient was extubated and admitted to the maternal high care unit and required further diuresis and continuous positive airway pressure (CPAP) before resolution of both preeclampsia and pulmonary oedema. A subsequent formal TTE confirmed a quadricuspid aortic valve with thickened valvular cusps and severe regurgitation, mild tricuspid and pulmonary regurgitation, and normal ventricular function. Four months post-partum the patient had fully recovered with minimal symptoms with a normal effort tolerance.

TTE and TOE

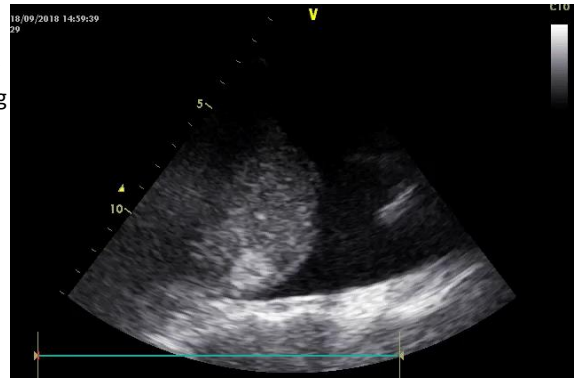
Video 1: TOE: Mid-oesophageal aortic valve short axis demonstrating quadricuspid aortic valve





Video 2: TTE: apical 5-chamber view demonstrating severe aortic regurgitation ←

Video 3: TTE: large pleural effusion→



Discussion

A quadricuspid aortic valve is a rare congenital cardiac defect found in only around 0.0059 - 0.0065% of people during transthoracic echocardiographic examinations.[2] QAV predominantly causes aortic regurgitation, which tends to be well tolerated in pregnancy due to the decrease in afterload provided by a decreased systemic vascular resistance.[1] It is not unusual for patients with undiagnosed cardiac lesions in lower-to-middle income countries to present in pregnancy to specialised cardiac services for the first time. Preeclampsia is also a common cause of maternal morbidity and mortality in South Africa.[3] The combination of these two pathologies may have significant adverse effects. The large increase in afterload in a patient with compromised diastolic function resulted in the patient developing severe pulmonary oedema. The value of point-of-care TTE was invaluable in the intraoperative management of this patient and contributed to the correct diagnosis and further therapy.

References

1. Nanna M, Stergiopoulos K. Pregnancy complicated by valvular heart disease: An update. *J Am Heart Assoc*. 2014;3(3):1-18. doi:10.1161/JAHA.113.000712
2. Yuan S-M. Quadricuspid Aortic Valve: A Comprehensive Review. *Brazilian J Cardiovasc Surg*. 2016;31(6):454-460. doi:10.5935/1678-9741.20160090
3. Gebhardt GS, Fawcus S, Moodley J, Farina Z. Maternal death and caesarean section in South Africa: Results from the 2011 - 2013 saving mothers report of the national committee for confidential enquiries into maternal deaths. *South African Med J*. 2015;105(4):287-291. doi:10.7196/SAMJ.9351