



Infective Endocarditis and Ectopic Pregnancy – A High Risk Case for Life Threatening Bleeding

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Abstract

A 37-year-old female with a history of ectopic pregnancy was found to have vegetation in the mitral valve and diagnosed as infective endocarditis. After emergency mitral valve surgery and 6 weeks of antimicrobial treatment, she was discharged home. Prompt diagnosis and early involvement of multidisciplinary team are prerequisite for successful outcome in this case.

Background

Infective endocarditis in ectopic pregnancy is rare and not reported in literature. We present a patient with a history of ectopic pregnancy with vascularized retained product of conception in the previous caesarean section scar and infective endocarditis with a 1.3 cm × 1.9 cm vegetation on the mitral valve. To the best of our knowledge, this is the first reported case of ectopic pregnancy with mitral valve surgery in the literature.

Case Presentation

A 36-year-old female was referred to the cardiac surgeons for the management of infective endocarditis involving the mitral valve. Blood cultures revealed group B *Streptococcus* bacteremia.

Initially, the patient tried home termination of pregnancy. She attended accident and emergency for unexplained fever. She was treated with methotrexate for medical termination of pregnancy and developed bacteremia and infective endocarditis. As a result of ongoing abdominal pain, per vaginal bleeding, fever, shortness of breath and being generally unwell, she was admitted to hospital for management of retained products of conception. High ongoing Beta-Human Chorionic Gonadotrophin (B-HCG) levels raised suspicion of ectopic pregnancy. Magnetic Resonance Imaging (MRI) demonstrated retained products of conception and a 'scar' ectopic pregnancy, with implantation of the embryo in the myometrial defect following previous uterine incision.

She had no history of cardiac comorbidity. Her obstetric history included three caesarean sections. Electrocardiogram showed sinus tachycardia with a heart rate of 130/min. C-Reactive Protein (CRP) was 110 mg/L and B-HCG was 1085 IU/L, other hematological reports were normal. The renal function was normal with eGFR 84 ml/min and creatinine 103 umol/L.

Transthoracic echocardiogram revealed a large irregular shaped vegetation measuring 1.3 cm × 1.9 cm attached to the posterior leaflet of the mitral valve with severe mitral regurgitation. Ejection fraction was 77% and there was a trace of tricuspid regurgitation. Trileaflet aortic valve did not show any evidence of stenosis and regurgitation. Coronary artery angiogram was not performed due to the patients age and case urgency.

MRI pelvis showed retained product of pregnancy attached to the thin perimetrium of the previous caesarean section scar. Bulky uterus consistent with recent pregnancy - this extended up to the sacral prominence. There was a thick (1.2 cm deep) rim of T2 bright, avidly enhancing/very vascular material in the region the anterior lower segment C-section scar (max AP diameter 5 cm), with adjacent low T2/T1 non-enhancing material distending the lower endometrial canal. Findings were consistent with recent scar ectopic and the suggestion of retained products of conception. No evidence of spread out with the uterine serosa/into the abutting urinary bladder wall - thin layer of myometrium anterior to it. No gestational sac was seen (Figure 1).

Cardiac surgeons, cardiologists, cardiac anesthetists and gynecologists were involved in decision-making. It was decided to perform urgent mitral valve surgery to prevent embolic complications. Scar ectopic pregnancy is associated with high spontaneous bleeding risk and there were concerns

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Received Date: 17 Mar 2023

Accepted Date: 29 Mar 2023

Published Date: 03 Apr 2023

Citation:

Barua A, McCall P, Shaikhrezai K. Infective Endocarditis and Ectopic Pregnancy – A High Risk Case for Life Threatening Bleeding. *Ann Clin Case Rep.* 2023; 8: 2401.

ISSN: 2474-1655.

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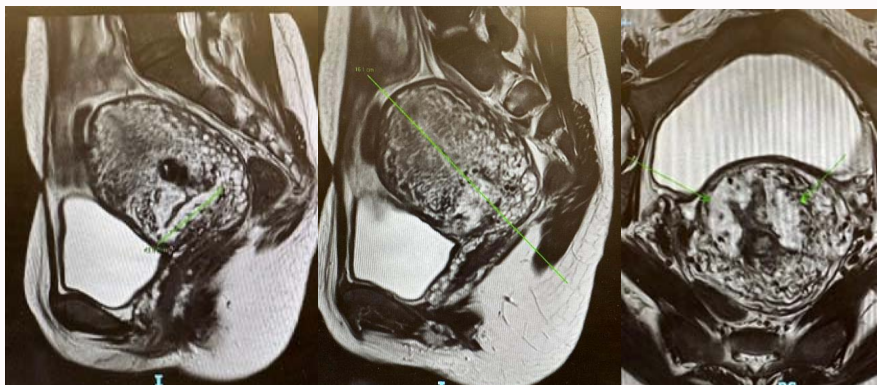


Figure 1: MRI pelvis demonstrating the retained product of pregnancy.



Figure 2: CT pelvis demonstrating the retained product of pregnancy.

that the anticoagulation required for Cardiopulmonary Bypass (CPB) may cause hemorrhage from the heavily vascularized retained product of conception. To explore the possibility of endovascular embolization of the uterine mass, a CT abdomen and pelvis with contrast was performed. This demonstrated a highly vascularized pelvic mass containing a number of distended, sinusoidal vessels was confirmed and early drainage into the iliac veins on each side suggestive of retained product of ectopic pregnancy (Figure 2). Following review by the interventional radiology team, embolization was not felt to be a suitable option for management.

Following multi-disciplinary team decision making it was decided that a gynecology team would be prepared in theatre. This was so emergent control of bleeding, including emergency hysterectomy, could be performed if required.

The intraoperative period was uneventful. Transesophageal echocardiography confirmed the preoperative findings (Figure 3). The patient was fully heparinized to an Activated Clotting Time (ACT) above 480 sec, placed on CPB *via* aorto-bicaval cannulation (Superior Vena Cava [SVC] and inferior Vena Cava [IVC]), and cooled to 32°C. Carbon Dioxide (CO₂) was insufflated across the operative field throughout the procedure. The oblique sinus was exposed and the IVC mobilized. Tapes were passed around SVC and IVC and the bypass drainage was checked by snaring the tapes. After confirming satisfactory drainage, the snares were released. Waterston's groove was dissected. The cross clamp was applied on the ascending aorta and 1,000 ml of cold blood cardioplegia along with adenosine 6 mg were delivered anterogradely *via* the aortic root. Intermittent cardioplegia doses were delivered in 20-min intervals throughout the CPB period *via* the aortic root. The left atriotomy

was developed and the native valve was interrogated. Mitral retractor was applied to elevate the left atrium and expose the valve. At this stage the heart was vented by sump suckers for adequate operative field clearance. Posterior leaflet revealed a 2 cm × 2 cm vegetation. Anterior leaflet's infection extending up to the papillary muscle. All infected tissues were dissected (Figure 4). The entire anterior leaflet with associated chordae tendineae were excised along with the posterior leaflet. The Left Atrium (LA) and Left Ventricle (LV) were washed with cold saline multiple times. A series of 2-0 pledgeted Ti-Cron™ mattress sutures were arrayed (pledgets in LA) around the mitral valve annulus and a size 27 mm On-X™ mechanical mitral valve (patient's preference) seated in the intra annular position. Tilting disks were tested and found to be opening satisfactorily. De-airing was performed with left ventricle massage and Valsalva maneuver. The cross clamp was removed after TOE confirmed that de airing was satisfactory, the mitral valve was well seated and there was no paravalvular leak. The patient was weaned from CPB on low levels of cardiovascular support and was transferred to the Intensive Care Unit (ICU) in a stable condition.

Postoperative course and recovery were uneventful with the patient spending one day in ICU and 10 days in hospital. Microbiology of the excised mitral valve tissue showed presence of numerous gram-positive cocci. The patient was on six weeks of antibiotics, ceftriaxone and doxycycline, as guided by the infective endocarditis team. HCG level dropped gradually from 1085 to 408 in a week's time. Postoperative blood culture report showed no growth of microorganism. Echocardiography one week following surgery demonstrated "well seated" mitral valve, no sign of mitral regurgitation, an antegrade velocity of 1.5 m/s and good LV systolic function.

Five weeks after discharge from hospital, patient developed uncontrolled vaginal bleeding and readmitted to hospital. Prophylactic common iliac artery balloon replacement was carryout along with total abdominal hysterectomy for control of on-going bleeding.

Discussion and Conclusion

Infective endocarditis in pregnancy is extremely rare with a reported incidence of 1 in 100,000 pregnancies [1]. The cardiovascular system goes through considerable change and adaptation during pregnancy. IE during the physiological change of pregnancy should be managed meticulously to minimize the mortality. Moreover, early involvement of a multidisciplinary team for management of



Figure 3: Transesophageal echocardiography demonstrating the vegetation.

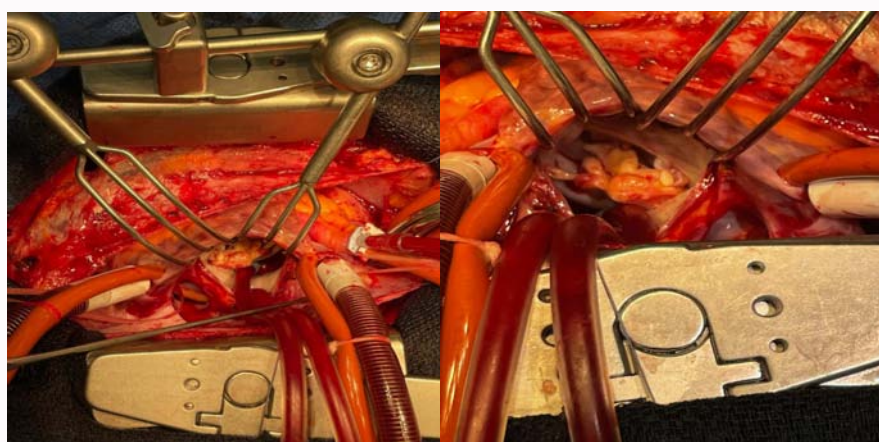


Figure 4: The posterior leaflet of the mitral valve.

IE reduces mortality and morbidity in this condition [2,3]. From the beginning, we involved the cardiologist, cardiac anesthetist, obstetrician and cardiac surgeons to deal with this complex case. To our knowledge, this is the first case in literature reporting infective endocarditis following medical termination of ectopic pregnancy.

For two reasons, the case is unique. Firstly, initial attempt to termination of pregnancy at home which resulted in infective endocarditis and secondly vascularized retained product of conception in thin walled perimetrium that could lead to life threatening hemorrhage during cardiopulmonary bypass.

Early surgical management for infective endocarditis depends on hemodynamic conditions such as heart failure and cardiogenic shock, risk of embolic event and risk of persistent infection. European Society of Cardiology (ESC) guidelines suggest urgent surgery with aortic and mitral valve vegetations with severe stenosis and regurgitation and low operative risk, or any vegetation >15 mm (class IIa) [4]. However, American College of Cardiology/American Heart Association (ACC/AHA) guidelines recommend early surgery for left sided mobile vegetation >10 mm irrespective of lesion or severity of operative risk (class IIb) [5]. The management in pregnancy is not different from the general population. Our patient was hemodynamically stable. We considered urgent surgery due to the size of vegetation and evidence of severe mitral regurgitation.

Our case report highlights that catastrophic bleeding from retained products of pregnancy during cardiopulmonary bypass might result in hemorrhagic shock and mortality. The aggressive

involvement of gynecologist during cardiac surgery is essential for better outcome and to avoid mortality and morbidity.

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