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Simultaneous liver resection and double cardiac valve replacement. A case report

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ABSTRACT

INTRODUCTION: We present a rare case in which both a double cardiac valve replacement was performed as well as a hepatic resection.

PRESENTATION OF CASE: We report the case of a 36 year old patient who presented with intra abdominal bleeding thought to have been caused by a liver haemangioma she also had severe autoimmune cardiac valve disease. She underwent a simultaneous right hepatectomy with cardiac valve replacement.

DISCUSSION: Management of this challenging case is discussed.

CONCLUSION: We advocate the possibility of performing combined operations where both valve replacement and hepatic resection is required.

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1. Introduction

We aim to highlight a rare case in which both a double cardiac valve replacement was performed as well as a hepatic resection. We believe this to be the first case of its kind reported. Each operation would have put the patient at risk if performed individually and as a consequence were performed together. We advocate the possibility of performing combined operations where both valve replacement and hepatic resection is required.

2. Case description

We report the case of a 36 year old Caucasian female who presented with a 6 day history of progressive right upper quadrant abdominal pain. The patient had a known diagnosis of Systemic Lupus Erythematosus (SLE) and antiphospholipid syndrome for which she was on oral anticoagulation. Her blood tests revealed a haemoglobin (Hb) 6 g/dl and an International Normalised Ratio (INR) of 8. A computed tomography (CT) scan of the abdomen showed a large subcapsular haematoma with no evidence of active bleeding and no definite intrahepatic cause (Fig. 1). The patient was managed conservatively requiring intensive care admission in the first instance. Warfarin was reversal initially with Vitamin K and then 2000 units of Beriplex. She was also transfused 2 units of fresh frozen plasma and 2 units of red blood cells.

Following recovery the patient had a Magnetic resonance imaging (MRI) scan which revealed a possible liver haemangioma close to the resolving haematoma (Fig. 2) and therefore she was scheduled for an elective right hemi-hepatectomy to prevent any further risk of potential bleeding. At preoperative anaesthetic assessment the presence of multiple heart murmurs was noted. Exercise capacity was found to be limited to just 200 yards by general malaise and cardio-pulmonary exercise testing revealed she was a high risk candidate for surgery. On further review of the patient's original admission there were several episodes of raised respiratory rate and decreased oxygen saturations possibly attributed to an element of heart failure. With this and the cardiopulmonary exercise test result in mind an echocardiogram was performed showing severe mitral regurgitation, moderate mitral stenosis and moderate aortic regurgitation requiring aortic and mitral valve replacement.

Both operations would have provided increased morbidity and mortality risk to the patient if performed separately: the hepatectomy would have implied an elevated risk of mortality due to the cardiovascular co-morbidities but on the other hand the valve replacements would have required heparinisation for the cardiopulmonary bypass posing the risk of a further hepatic haemorrhage.

To minimise the risk a synchronous procedure was performed between the cardiothoracic and hepatobiliary surgeons. Preoperatively the patient had been off warfarin for six months, using prophylactic low molecular weight heparin for anticoagulation. She had a normal prothrombin time but the activated partial thromboplastin time was elevated at 49.

The chest and the abdomen were opened and surgical fields were exposed. Following laparotomy, the right liver lobe was

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Fig. 1. CT scan of the abdomen shows a large subcapsular haematoma with no evidence of active bleeding and no definite intrahepatic cause.

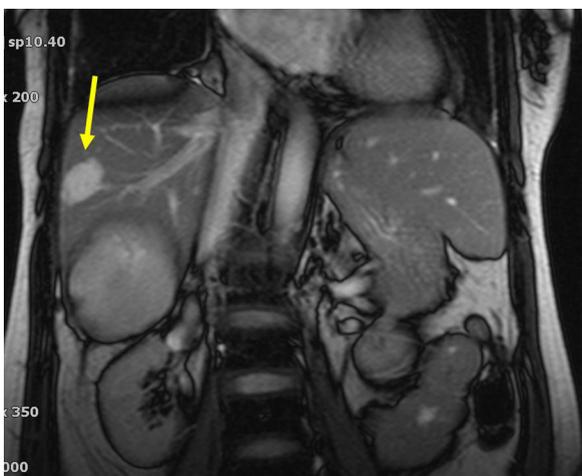


Fig. 2. MRI reveals a possible liver haemangioma close to the resolving haematoma.

mobilised. The upper surface of the liver was exposed up to the anterior surface of the suprahepatic inferior vena cava (IVC). The space between the right and middle hepatic veins was dissected and the right hepatic vein was encircled.

The right hepatic artery and the right portal vein were occluded to demarcate the parenchymal perfusion. The middle hepatic vein was identified with an intraoperative ultrasound scan.

The right hepatic artery was tied; the right portal vein and the right hepatic vein were divided using the Echelon Endoscopic Cutter 60-mm stapler.

The surgeon dissected the hepatic parenchyma from the patient's right side using the Cavitron Ultrasonic Surgical Aspirator (CUSA®), while the assistant surgeon used the TissueLink hemostatic sealer from the patient's left side. A right hemi-hepatectomy was first performed and the liver remnant was packed leaving the abdomen opened. Following this the patient was fully heparinised and placed onto cardiopulmonary bypass for total duration of 1 h 50 min, cross clamp time was 85 min. During this time both the aortic and mitral valves replaced with metallic valves. No major bleeding was observed within the abdomen. The heparinization was then reversed with Protamine Sulfate. The liver cut surface required further haemostasis but no further packing was required. Intraoperative losses totalled 3437 ml. Replacement was given by way of 6 units of red blood cells as well as 4 units of fresh frozen

plasma and 2 units of platelets. A cell saver was used intraoperatively to give autologous transfusion totalling 1520 ml. 3000 ml of colloid was also given during the procedure. Prior to the end of surgery the patient was given 2 grams of tranexamic acid at the advice of haematology to aid haemostasis. In recovery the patient had a further 4 units of fresh frozen plasma, 1 unit of red blood cells and 1 unit of cryoprecipitate. Total time for the operation from induction to recovery was 9 h 10 min.

The postoperative course was uneventful and initially managed in a high dependency cardiac unit. Liver synthetic function recovered and the patient's renal function was unaffected by the operation. Due to a gradual drop in haemoglobin by day 4 post operation she was transfused a final two units. Haemoglobin remained stable from this point on and no further transfusions were required. Heparin i.v. was run as a continuous infusion targeting an activated partial thromboplastin time (APTT) of 2.5 and was continued until postoperative day 7 when oral anticoagulation was restarted as appropriate. Post operative recovery for the patient was spent in the high dependency cardiac unit for 4 days before transfer to the ward where she was discharged after 6 days.

Final histology showed a large liver haematoma without apparent relation to a small adjacent liver haemangioma. No widespread vasculitis or pseudoaneurysm was noted and the case was labelled as spontaneous liver bleeding possibly secondary to oral anticoagulation.^{1–3} The cardiac valves showed typical findings of SLE.

This is the first case reporting simultaneous liver resection and double cardiac valve replacement. A few cases have been reported combining liver transplant and valve replacement^{4,5} which does not carry the challenge of having a liver cut surface to control.

We support the possibility to perform in these cases simultaneously cardiac and liver surgery. This approach is particularly useful in SLE patients needing liver resection (28% of SLE patients have valvular disease⁶) and patients with carcinoid heart disease precluding operation for resectable hepatic metastases.

Conflict of interest statement

The authors declare that there is no conflict of interest.

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None.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

FA, BCJ and JHD looked after the patient. FA and DH wrote the report. BH analysed the surgical specimens. All authors revised and approved the final report.

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