

Management of Ruptured Subcapsular Hepatic Haematoma Diagnosed at Emergency Caesarean Section

Dr Paul Elie Faraj¹, Dr Kristina Savickaite¹, Dr Ahmed Shelbaia¹, Miss Rasha Al-Jaboree¹

¹ Department of Obstetrics and Gynaecology, Luton and Dunstable University Hospital



Bedfordshire Hospitals

NHS Foundation Trust

INTRODUCTION

HELLP (hemolysis, elevated liver enzymes, and low platelets) syndrome may develop in 10-20 % of obstetric patients with pre-eclampsia or 0.16-0.25% of all pregnancies.^{1,2}

Pathophysiological development of hepatic haematoma/rupture is considered to be associated with massive hepatic congestion and necrosis caused by periportal and intravascular fibrin depositions secondary to vasoconstriction induced endothelial damage.²

Hepatic rupture is a rare obstetric complication. Reported prevalence is approximately 1 in 67 000 childbirths, however, co-existing conditions, for example, pre-eclampsia, eclampsia and HELLP syndrome increases the incidence of hepatic rupture to 1 in 2 000.³ Associated maternal mortality rate varies from 7.5% to 39%.^{4,5} Hepatic heamatoma and rupture commonly occurs between 28 and 36 weeks of gestation. It can also manifest postnatally or intrapartum.⁶

The most common symptoms of hepatic pathology is pain (~90% of cases) in epigastrium or right upper quadrant.⁷ Other presenting complains are nausea and vomiting, malaise, or even sudden circulatory collapse.

CASE HISTORY

A 29-years-old, fit and well, white British, primigravida with a monochorionic diamniotic twin pregnancy monitored by the multiple pregnancy antenatal clinic and started on Aspirin 150mg OD. The patient was booked for an elective caesarean section (ELCS) at 36 weeks. She presented at 36+1 weeks of gestation, two days prior to her ELCS, for the second dose of dexamethasone when she was found to have raised blood pressure and proteinuria. Subsequently, her blood pressure profile was normal and she was discharged. The following day, she presented at maternity triage with acute upper abdominal pain and raised blood pressure. The patient had a full pre-eclampsia (PET) workup, PLT count was 119x 10⁹/L, Alanine Aminotransferase (ALT) was 136 U/L and creatinine was 105 μmol/L and she was commenced on antihypertensive medication. Later that day, the patient became drowsy with worsening of her upper abdominal pain. A consultant decision for emergency C-section was made.

MANAGEMENT

At time of C-section, haemoperitoneum was noted and one litre of blood was evacuated and babies were immediately delivered. Major obstetric haemorrhage call was put out and consultant was asked to attend theatre. General Anaesthesia commenced and the general surgeon on-call was contacted to attend theatre. Midline laparotomy was performed and the ruptured subcapsular haematoma was confirmed. Four large packs were placed in the right upper quadrant and one was placed over the uterus prior to abdominal closure. Intraoperative platelets was found to be 40x10⁹/L. The patient had a total of 4-litre blood loss, was given oxytocin bolus of 5 units and 40 units infusion over 4 hours, 1 dose of ergometrine 500 mcg and 3 doses of carbetocin 250 microgram 15 mins apart. 4 units of packed red blood cells (RBC) and 2 units of fresh frozen plasma (FFP) transfused by the end of the operation.

MANAGEMENT

The patient was then transferred to Intensive Therapy Unit with HELLP, acute kidney injury (AKI), hypoglycaemia and suspected disseminated intravascular coagulation (DIC). Day 3 post-op the patient had relook laparotomy, packs were removed and veriest was placed over the ruptured capsule of the liver. Two Robinson drains were placed and the patient was extubated later that day. The patients recovery was complicated with PET, type 1 respiratory failure with evidence of consolidations and pleural effusion, AKI, DIC, sepsis, major blood transfusion requiring 14 units of RBC, 8 units of FFP, 7 pools of platelets, 8 units of cryoprecipitate and 4 units of Albumin infusions in total. Patient had an indwelling catheter for strict input output monitoring, mechanical thromboprophylaxis, antihypertensives, diuretics, antibiotics, morphine PCA and oxygen support throughout her recovery period and was discharged 2 weeks post her C-section.

INVESTIGATIONS

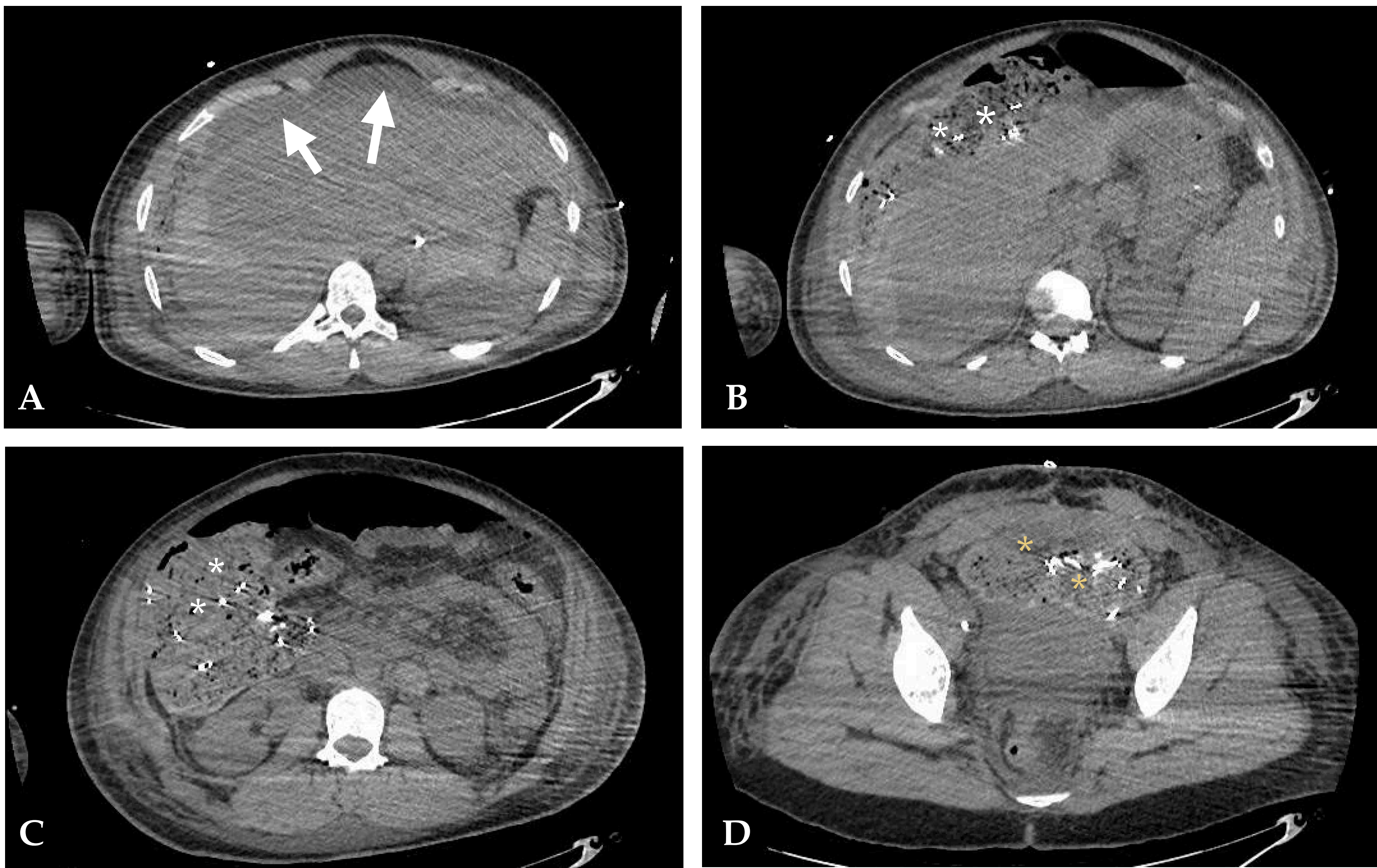


Figure 1. Computed Tomography (CT) Abdomen pelvis. A. There is a large perihepatic/subcapsular acute Haematoma (white arrows). Maximum depth of 3.5 cm. No active bleeding or contrast extravasation. Surgical packing in the perihepatic/subphrenic region (white asterisks in B & C) as well as in the pelvis (yellow asterisks in D).

DISCUSSION

In approximately 40% of hepatic rupture cases, diagnosis is established intraoperatively.⁴ Risk factors for hepatic rupture are multiparty, advanced maternal age (≥ 40 y.o.), white ethnicity. Risk increases after 32 weeks gestation and within 15 hours postpartum.⁸

Currently there is no standard management, but early surgical interventions reduce mortality significantly. If the patient is stable, conservative management is appropriate. It includes computed tomography (CT) to assess the injury, transfer to tertiary hepatobiliary centre, coagulopathy correction, blood transfusion and regular CT and/or MRI monitoring.⁹

Perihepatic packing demonstrated 82% of survival rates.⁴ This management option with haemostatic agents is effective to control liver haemorrhage and expanding haematoma in unstable patients. Other surgical management techniques include drainage of hepatic lesion, hepatic artery ligation, liver suturing, fibrin gluing or omentum patches and energy sources, which can be used where liver suturing is not easily achievable. Alternatively, anatomic and non-anatomic resection or total hepatectomy with or without a temporary porto-caval shunt prior to liver transplantation should be considered in extensive liver injuries.¹⁰

Alongside surgical management, low doses of factor VIIa (< 40 mcg/kg) can be given with fresh frozen plasma. It can help to reduce fluid overload and risk of pulmonary oedema.⁴

In the setting of easily accessible experienced interventional radiologist service, hepatic artery embolisation can be considered in haemodinamically stable patients.

Critical care input is required to safely and properly manage common complications that include pleural effusion, acute respiratory distress, pulmonary or cerebral oedema, subphrenic collection, intrahepatic abscess, renal failure, thrombotic events, coagulopathies (e.g. DIC), abdominal compartment syndrome.^{4,11}

CONCLUSIONS

Hepatic rupture is a life-threatening obstetric complication in the background of pre-existing thrombocytopenia along with uncontrolled haemorrhage from liver that further increase the risk of coagulopathy.

Optimal feto-maternal outcomes require high-level of suspicion, specialised, focused and exhaustive management, including surgical techniques and intense haemostatic resuscitation, in unwell patients presenting with hepatic haematoma and/or rupture.

REFERENCES

- ¹ Sibai BM. Diagnosis, controversies, and management of the syndrome of hemolysis, elevated liver enzymes, and low platelet count. *Obstet Gynecol.* 2004 May;103(5 Pt 1):981-91. doi: 10.1097/01.AOG.0000126245.35811.2a. PMID: 15121574.
- ² McCormick PA, Higgins M, McCormick CA, Nolan N, Docherty JR. Hepatic infarction, hematoma, and rupture in HELLP syndrome: support for a vasospastic hypothesis. *J Matern Fetal Neonatal Med.* 2021 Jun 15:1-6. doi: 10.1080/14767058.2021.1939299. Epub ahead of print. PMID: 34130599.
- ³ Pavlis T, Aloizos S, Aravosita P, Mystakelli C, Petrochilou D, Dimopoulos N, Gourgiotis S. Diagnosis and surgical management of spontaneous hepatic rupture associated with HELLP syndrome. *J Surg Educ.* 2009 May-Jun;66(3):163-7. doi: 10.1016/j.j Surg.2009.04.001. PMID: 19712916.
- ⁴ Dubey S, Rani J. "Hepatic rupture in preeclampsia and HELLP syndrome: A catastrophic presentation". *Taiwan J Obstet Gynecol.* 2020 Sep;39(5):643-651. doi: 10.1016/j.tjog.2020.07.003. PMID: 32917311.
- ⁵ M.F. Escobar Vidarte, D. Montes, A. Pérez, S. Loaiza-Osorio, A. José Nieto Calvache Hepatic rupture associated with preeclampsia, report of three cases and literature review *J Matern Fetal Neonatal Med,* 27 (2018),
- ⁶ Sibai BM, Ramadan MK, Usta I, Salama M, Mercer BM, Friedman SA. Maternal morbidity and mortality in 442 pregnancies with hemolysis, elevated liver enzymes, and low platelets (HELLP syndrome). *Am J Obstet Gynecol.* 1993 Oct;169(4):1000-6. doi: 10.1016/0002-9378(93)90043-I. PMID: 8238109.
- ⁷ Barton JR, Sibai BM. Care of the pregnancy complicated by HELLP syndrome. *Obstet Gynecol Clin North Am.* 1991 Jun;18(2):165-79. PMID: 1945249.
- ⁸ Gil MP, Rosquil EU, Martí IP, Manterola J del R, Vázquez TL, Izquieta MR. Hematoma hepático espontáneo en gestante a término durante el trabajo de parto. *An Sist Sanit Navar.* 2017 Aug 31;40(2):295-7
- ⁹ Wilson SG, White AD, Young AL, Davies MH, Pollard SG. The management of the surgical complications of HELLP syndrome. *Ann R Coll Surg Engl.* 2014 Oct;96(7):512-6. doi: 10.1308/003588414X13946184901362. PMID: 25245729; PMCID: PMC4473436.
- ¹⁰ Varotti G, Andorno E, Valente U. Liver transplantation for spontaneous hepatic rupture associated with HELLP syndrome. *Int J Gynaecol Obstet.* 2010 Oct;111(1):84-5. doi: 10.1016/j.ijog.2010.05.010. Epub 2010 Jul 8. PMID: 20619409.
- ¹¹ Neligan PJ, Laffey JG. Clinical review: Special populations—critical illness and pregnancy. *Crit Care.* 2011 Aug 12;15(4):227. doi: 10.1186/cc10256. PMID: 21888683; PMCID: PMC3387584.