

## Case Report

Citation: Arudchelvam J, Masakorala ND, Nishanthan A et al., 2025. Bilateral Ovarian Artery Rupture Causing Retroperitoneal Haematoma: An Uncommon Etiology of Post-Caesarean Hypotension. Sri Lanka Journal of Medicine, pp . 31-34  
DOI: <https://doi.org/10.4038/sljmv.v34i3.597>

## Bilateral Ovarian Artery Rupture Causing Retroperitoneal Haematoma: An Uncommon Etiology of Post-Caesarean Hypotension

J Arudchelvam<sup>1</sup>, ND Masakorala<sup>1</sup>, A Nishanthan<sup>1</sup>, M Bandara<sup>1</sup>, J Danicious<sup>2</sup>, UDP Ratnasiri<sup>1</sup>

<sup>1</sup>National Hospital of Sri Lanka, Colombo, Sri Lanka

<sup>2</sup>The Castle Street Hospital for Women, Colombo, Sri Lanka.

## Correspondence:

J Arudchelvam

E mail: [joelaru@srg.cmb.ac.lk](mailto:joelaru@srg.cmb.ac.lk)

 <https://orcid.org/0000-0002-4371-4527>

### ABSTRACT

Retroperitoneal haematoma in the peripartum period is rare, occurring in 0.07% to 0.32% of deliveries. Common causes of postpartum retroperitoneal haematoma are trauma and spontaneous haemorrhage due to the rupture of arterial aneurysms, rupture of tumours and rupture of ovarian arteries. Rupture of the ovarian arteries is rare, accounting for only 5.24% of all cases. The diagnosis of retroperitoneal haematoma as a cause of hemodynamic instability in the peripartum period may be delayed due to its rarity and due to the difficulty of eliciting clinical signs in the peripartum period. This case report describes a patient who had rupture of bilateral ovarian arteries in the peripartum period.

**Keywords:** Ovarian artery, rupture, spontaneous retroperitoneal haematoma

### INTRODUCTION

Retroperitoneal haematoma in the peripartum period is rare, occurring at a rate of 1 in 309 to 1 in 1500 deliveries (1).

Common causes of postpartum retroperitoneal haematoma are trauma (occurring during the manipulation of the uterus during the caesarean section) and spontaneous retroperitoneal haematomas (without any preceding trauma). Spontaneous retroperitoneal haematomas occur due to rupture of aneurysms, rupture of tumours and rupture of ovarian arteries. Rupture of the ovarian arteries is rare, accounting for only 5.24% of retroperitoneal haematomas (2), (3).

The diagnosis of retroperitoneal haematoma as a cause of hemodynamic instability in the peripartum period may be delayed due to the rarity of this event and due to the difficulty of eliciting clinical signs in the peripartum period, especially following a caesarean section. This case report is on a patient who had rupture of bilateral ovarian arteries in the peripartum period.

### CASE REPORT

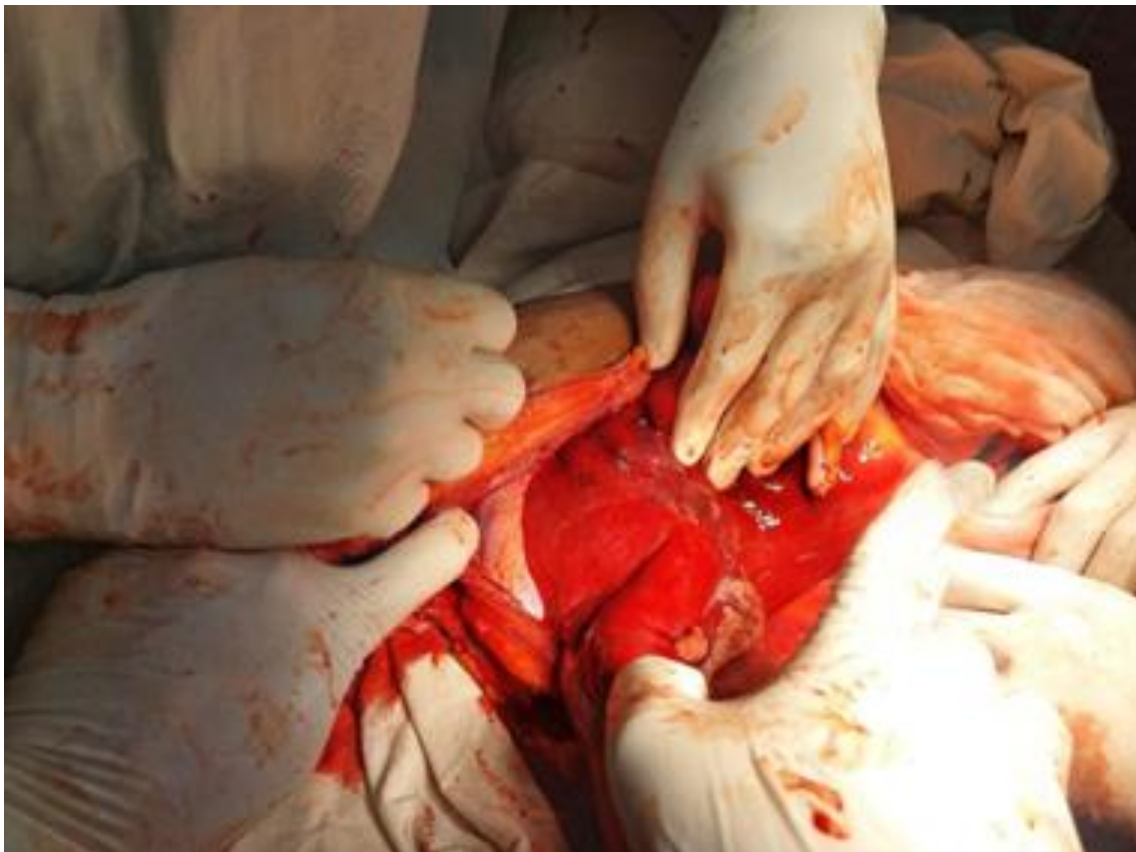
A 33-year-old female, who was diagnosed with placenta accreta in the lower segment of the uterus in her second pregnancy with 38 weeks of gestation, underwent an emergency Lower Segment Caesarean Section (LSCS) for antepartum

haemorrhage. The placenta was not adhered to adjacent structures. Total blood loss was one litre, and three units of packed red cells were transfused intraoperatively. The patient was transferred to the Intensive Care Unit (ICU). There was no significant per vaginal bleeding post operatively. Five hours later, the patient developed abdominal distension together with hemodynamic instability. An intra-abdominal bleeding was suspected, and the patient was taken to the theatre for an emergency re-laparotomy.

During the laparotomy, a large retroperitoneal haematoma was noted on the right-side lumbar region of the abdomen (Figure 1) with a small extension of the retroperitoneal haematoma to the left side. The right retroperitoneal haematoma was explored the haematoma was opened and about six hundred millilitres of haematoma was evacuated. Bleeding was noted from the right ovarian artery laceration. The ovarian artery was dilated, tortuous and had a very thin wall. But there were no aneurysms detected on the ovarian artery. The laceration was partial and was found at the level of the pelvic brim. The right ovarian artery was ligated and haemostasis was achieved.

The patient became haemodynamically stable. Since the left-sided retroperitoneal haematoma was small and the patient was haemodynamically stable. Therefore, the left side haematoma was thought to be the extension of the right-side haematoma and was not explored. The patient was sent back to the ICU. 12 hours later, the patient became haemodynamically unstable again. Distension was noted in the left lumbar region. An expanding haematoma in the left retroperitoneal area was suspected, and the patient was taken for relaparotomy. Upon relaparotomy, a large left-sided retroperitoneal haematoma was noted. Haematoma was evacuated, and a laceration of the left ovarian artery was noted. The left ovarian artery was similar in appearance to the right-sided artery. Haemostasis was achieved with ligation of the left ovarian artery.

The patient was sent back to the ICU. She had an uneventful postoperative period and recovered completely.



**Figure 1: Intraoperative image showing the right-side retroperitoneal haematoma**

## DISCUSSION

The ovarian artery arises from the abdominal aorta at the level of the second lumbar vertebra (L2). It runs distally in the retroperitoneal area on the Psoas major muscle. At the pelvic brim it turns medially and runs in the suspensory ligament of the ovary. The ovarian artery anastomoses with the ascending branch of the uterine artery (the utero ovarian communicating artery) in the mesosalpinx. The ovarian artery supplies the ovary, fallopian tube and the uterus.

During pregnancy the ovarian and uterine vessels undergo significant changes. These changes are initiated by; the development of placenta, hormonal and the physiological changes that occur during pregnancy e.g. Increased blood volume and cardiac output (4). In response to these changes, these arteries increase in diameter and tortuosity and the wall of the artery becomes thin. The smooth muscle cells in the media increase in length (5).

The blood flow within these arteries is also increased due to increased flow through the placenta. The blood flow through the utero ovarian communicating arterial system also increases. The uterine arterial flow increases from 20–50 ml/min (normal) to 450–800 ml/min during pregnancy with a corresponding increase in the ovarian arterial blood. Because of the dilatation and thinning of the arterial wall there is an increased risk of rupture. And due to increased flow within the artery there will be increased bleeding.

Postpartum retroperitoneal haematoma can occur due to trauma and spontaneously without trauma (spontaneous retroperitoneal haematoma e.g. due to rupture of arterial aneurysms, hypertension, endometriosis, coagulation disorders, etc. (6)). The trauma to the ovarian arteries can occur during the caesarean section, due to the stretching of the ovarian arteries by the manipulation of the uterus (1). This was the probable reason in the above-described case.

Peripartum rupture of the ovarian artery is rare and there are very few reported cases of bilateral ovarian artery rupture in the peripartum period.

The reported cases are from the ovarian artery aneurysms (7), (8), (9), (10). In one series of retroperitoneal haematomas, 5.24% were due to the rupture of the ovarian arteries (2).

Patients after rupture of ovarian arteries can present immediately with features of bleeding or they can even present after 4 to 5 days later (4). Patients develop abdominal or loin pain, a mass and haemodynamic instability. But following delivery especially after LSCS these clinical signs can be missed.

Ultrasound scan (USS) of the abdomen and Computerized Tomographic scan (CT) of the abdomen can confirm the diagnosis. USS is difficult to perform in the postoperative period. CT abdomen can identify the source of bleeding and will assist in planning the management. But it is not readily available and performing a CT scan for an unstable patient is not practical. Therefore, CT was not done in the above-described patient.

The left ovarian arterial laceration in the above patient also occurred during the caesarean section during uterine manipulation. It probably manifested later due to the retroperitoneal location.

Management options include emergency laparotomy and ligation or angiography and embolization. There are case reports mentioning embolisation of the ruptured ovarian artery embolised with gelatin foam (4). Embolisation can be attempted in a patient, who becomes haemodynamically stable after resuscitation. In the above-described patient, embolization was not attempted due to lack of facilities and haemodynamic instability.

Therefore, rupture of arteries in the retroperitoneal location should be considered in the peripartum period in cases of haemodynamic instability with no manifested haemorrhage.

**Author declaration****Acknowledgement**

None.

**Authors' contributions:**

Conceptualisation and Design: JA, NDM, AN, MB, JD, UDP; Writing – Original Draft: JA; Literature Review: JA; Image Preparation: JA; Writing – Review & Editing: JA, NDM, AN, MB, JD, UDP.

**Conflicts of interest:**

The authors declare that there is no financial or non-financial conflict of interest.

**Funding statement:**

Self-funded.

**Ethics statement:**

Written informed consent was obtained from the patient before they participated in the case, ensuring their understanding of the purpose, procedures, and potential implications involved.

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