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# Hemoperitoneum caused by spontaneous rupture of a leiomyoma: A case report

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ABSTRACT

Uterine myomas, fibroids or leiomyomas are benign neoplasms that can present as abnormal uterine bleeding and pressure symptoms. Significant complications are infrequent, but they can be life-threatening. This is a case of a ruptured fibroid where excessive intra-abdominal bleeding resulted in hemoperitoneum. In this clinical scenario, timely recognition and intervention were essential to prevent morbidity and mortality.

This article discusses the diagnostic challenges and surgical management of a case of hemoperitoneum resulting from spontaneous haemorrhage from a ruptured vessel on the surface of a subserosal leiomyoma.

A 42-year-old patient with a known multi-fibroid uterus awaiting elective surgery presented with acute-onset abdominal pain to the emergency department. She had a distended, tender abdomen. Laboratory tests and contrast computerised tomography revealed haemorrhage with no clear source of bleeding. Emergency midline laparotomy revealed active bleeding from the surface of a posterior subserosal leiomyoma with 1950 mL hemoperitoneum. A total abdominal hysterectomy was performed, and the patient had an uncomplicated recovery.

The pre-operative haemoglobin level was 80 g/L, which normalized after several blood transfusions. Histopathological examination confirmed multiple leiomyomas and haemorrhage associated with ischaemic changes.

Hemoperitoneum from a bleeding degenerating leiomyoma is an exceedingly uncommon complication. The atypical presentation of abdominal pain and the presence of a multi-fibroid uterus posed diagnostic challenges. This case underscores the importance of considering leiomyomas as a potential cause of acute abdominal pain and bleeding. Timely surgical intervention, supported by a multidisciplinary approach, is essential for optimal patient outcome.

## 1. Introduction

Uterine leiomyomas, myomas or fibroids are benign tumours which occur in the myometrium of the uterus. They are commonly found in women of reproductive age, and have higher incidences in certain ethnicities [1]. Some studies report the lifetime incidence to be as high as 70% [2].

Many patients remain asymptomatic; however, the most common symptoms are abnormal uterine bleeding (AUB), dysmenorrhoea and chronic pelvic pain, which occur in 25% of cases [2]. AUB often causes anaemia, iron deficiency and associated lethargy [3]. Patients can also present with dyspareunia, torsion of the fibroid, protrusions of fibroids through the cervix, bladder and bowel symptoms, infertility and recurrent miscarriage [4]. Leiomyomas are one of the most common indications for hysterectomies in Australia [5].

These tumours can significantly decrease a person's quality of life [6] and in rare cases carry significant morbidity and mortality if there is delayed diagnosis and management [3,4]. Hemoperitoneum due to a bleeding leiomyoma is exceptionally uncommon but carries the potential for catastrophic consequences. This case report serves as a critical illustration of such an unusual and perilous event.

## 2. Case Presentation

A 42-year-old patient presented to the emergency department (ED) with severe, sudden-onset acute abdominal pain. She had no precipitating illness, symptoms or trauma. She was booked to have an elective hysterectomy in the following week at a peripheral hospital.

Her obstetric and gynaecological history included the known history of a multi-fibroid uterus with significant AUB, for which she was

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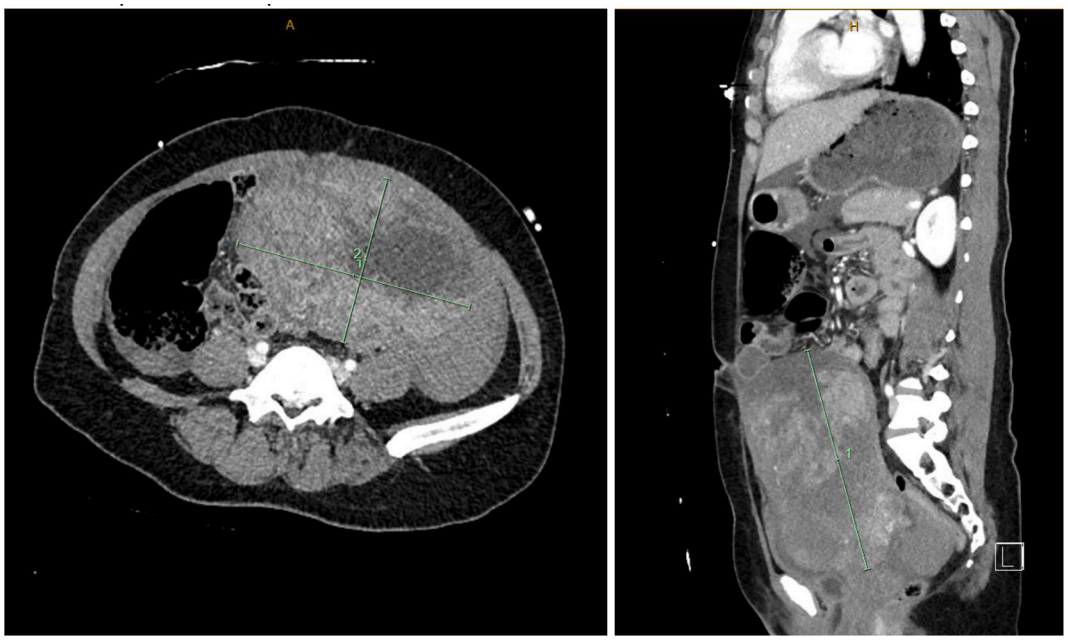


**Fig. 1.** CT imaging showing transverse and sagittal views of the uterus with large leiomyomas and hemoperitoneum present.

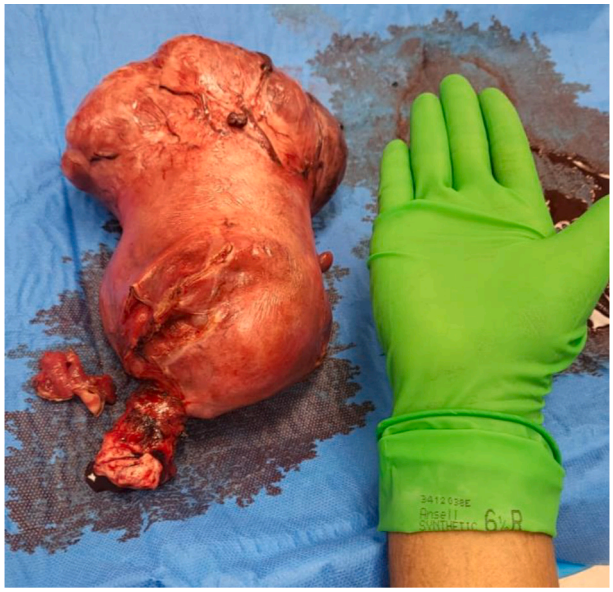

**Fig. 2.** Laparotomy imaging - detached multi-fibroid uterus.

awaiting definitive surgical management. She had three children, two born via vaginal delivery and the third via caesarean section.

She presented in hypovolemic shock with tachycardia (110 bpm), tachypnoea (RR 50) and was hypotensive (95/60 mmHg). She was afebrile and had normal oxygen saturation on room air. Her body mass index (BMI) was 21. The distended abdomen revealed a previous Pfannenstiel incision and was tender on light palpation but peritonism was not elicited.

Her initial blood tests reported a haemaglobin (Hb) of 98 g/L, lactate of 8.3, normal renal function, liver function and an iron store deficiency. Three hours post-admission, her Hb was 80 g/L. Bedside focused assessment with sonography for trauma (FAST) in ED revealed extensive hemoperitoneum and an enlarged multi-fibroid uterus.

Urgent abdominal computerised tomography (CT) with contrast demonstrated an enlarged uterus measuring 134 × 95 × 170 mm (H x W x D) with presumed fibroids and features suggestive of acute haemorrhage [Fig. 1]. There was a large-volume hemoperitoneum, indicating a more recent haemorrhage but no focal haemorrhage point and no active arterial blush of contrast extravasation were seen. Other organs appeared normal and no other obvious source of bleeding was identified.

The patient was transfused with three units of packed red blood cells and urgent exploratory laparotomy was performed. An infraumbilical midline incision was made and 1950 mL of blood was evacuated from the abdominal cavity. The uterus was enlarged with a fundal subserosal fibroid which had evidence of a small active arterial bleeder from the posterior aspect where there were many engorged vessels. The arterial bleed was observed at the junction of the fundus and the fibroid. Bilateral ovaries and fallopian tubes appeared unremarkable, and the appendix and liver appeared normal. A total abdominal hysterectomy was performed. The specimen was removed and sent for histology [Fig. 2], and a Blake drain was inserted on free drainage. There was a total estimated blood loss of 2250 mL. The patient was commenced on antibiotics.

The histopathology specimen weighed 1036 g; multiple leiomyomas and haemorrhage from a subserosa leiomyoma with associated ischaemic-type changes were reported. Coincidently, cervical intraepithelial neoplasia 3 (CIN 3) was also found, which was noted to be completely excised with clear margins.

Postoperatively the patient's haemaglobin stabilised, and she was discharged 4 days later after a short stay in ICU. She presented for her 8-week post-operative follow-up with a well healed surgical incision and no concerns to report.

## 3. Discussion

Uterine leiomyomas are common, benign monoclonal smooth muscle tumours [3]. They are often asymptomatic; however, significant morbidity can arise due to pain and bleeding leading to hemoperitoneum and hypovolemic shock. Common gynaecological causes of hemoperitoneum include ruptured ectopic pregnancies or ruptured corpus luteal cysts [7]. Both were excluded in this case through a negative β-human chorionic gonadotropin (bHCG) level, ultrasound and contrast-enhanced CT imaging. It is important to exclude other causes of bleeding such as ruptured corpus luteum or ruptured ectopic

pregnancies, especially in women of reproductive age. Rapid resuscitation and additional surgical opinions can be sought to improve outcomes and aid in management.

Only 100 cases of fibroid-related hemoperitoneum have been reported [8]. The mechanism of hemoperitoneum secondary to uterine leiomyomas most commonly results from serosal vessel rupture, with venous rupture also capable of causing significant bleeding [9,10]. This patient had a subserosal fibroid measuring 118 × 84 × 65 mm. Large leiomyomas are more likely to bleed than are small ones [8]. Often, no acute cause of bleeding is found; however, laceration, avulsion, torsion, or rupture of a degenerative fibroid or fibroid capsule may contribute to this rare complication [11]. Other documented risk factors include intense physical activity, menstruation, trauma and exercise [8].

Medical management of symptomatic leiomyomas includes combined estrogen-progesterone contraceptives, progestin-releasing intrauterine devices (IUDs), tranexamic acid and gonadotropin-releasing hormone (GnRH) agonists and antagonists [12]. Interventional radiology (IR) guided embolization has also been utilised [13].

The surgical treatment for symptomatic leiomyomas include laparoscopy, myomectomy, laparotomy and hysterectomy [12]. For elective procedures, pre-operative treatment with GnRH antagonists and agonists are useful to reduce the size of leiomyomas, which can improve surgical access [14]. Postmenopausal patients who have completed their families may choose to have a hysterectomy. Myomectomy is an alternate treatment option in individuals who wish to preserve their fertility. It is important to appropriately counsel patients who have not completed their families, as the intervention may be different.

The management for leiomyoma-related hemoperitoneum includes early identification, acute resuscitation and urgent control of the bleeding.

This case report adds to the growing literature documenting the rare complications of uterine leiomyomas. In this instance, the patient presented to a tertiary hospital which had multiple imaging modalities, multiple surgical specialities available and an intensive care unit (ICU). The patient was able to be rapidly assessed, resuscitated and stabilised for theatre. These options can be limited in rural settings. If a bleeding leiomyoma is suspected, it may prompt early retrieval, stabilisation or even lifesaving surgery by these teams.

## 4. Conclusion

Bleeding intra-abdominal leiomyomas are a rare but an important differential to consider with a hemoperitoneum of unclear origin in a woman. They can bleed rapidly, causing acute hypovolemic shock, with significant morbidity and mortality. Urgent resuscitative measures and rapid access to multiple imaging modalities allow for rapid diagnosis and improved patient outcomes. The treatment modality will depend on the patient's request for fertility preservation. Further research into non-surgical management of symptomatic leiomyomas could significantly improve the quality of life of many patients.

### *Contributors*

Michael McKendrick contributed to acquisition and analysis of data as well as drafting of the report and revision of the manuscript.

Vinita Rajadurai contributed to acquisition and analysis of data and was involved in the patient's care and revision of the manuscript.

Jennifer Weishaupt contributed to acquisition and analysis of data and was involved in the patient's care.

Venkata Kasina contributed to acquisition and analysis of data and was involved in the patient's care.

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### *Conflict of interest statement*

The authors declare that they have no conflict of interest regarding the publication of this case report.

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