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Case Report

Hemoperitoneum from ruptured vein overlying a uterine myoma: a case report and review of the literature

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Summary

Uterine myomas are very common tumors in women, but there are few reports of cases causing hemoperitoneum. Here, the authors report a case of a ruptured vein overlying a uterine myoma due to trauma. A 28-year-old nulliparous woman with a history of uterine myomas came to the emergency department with acute lower abdominal pain after falling on her hip while snowboarding. Ultrasound and contrast-enhanced computed tomography revealed multiple myomas and free fluid in the pelvic cavity. Her vital signs became unstable and an emergency laparotomy was performed. There was massive hemorrhage into the abdominal cavity and venous rupture over the site of a subserosal myoma. Following myomectomy, the bleeding stopped and her vital signs gradually became stable. Rupture of a vein overlying a uterine myoma is rare; however, intra-abdominal bleeding should be considered in women with a history of large fibroid presenting with shock and circulatory collapse with or without a history of trauma.

Key words: Intraperitoneal hemorrhage; Ruptured uterine leiomyoma; Trauma.

Introduction

Uterine myomas are common tumors found in women of reproductive age. The incidence of uterine myomas is 5.4% to 77%, depending on the population studied and the method of diagnosis [1]. Uterine myomas are well-circumscribed lesions composed of smooth muscle and a pseudocapsule with feeding vasculature often surrounding the myoma. Additionally, pedunculated myomas are identified by the direct vascular supply seen on sonography [2].

Uterine myomas can cause menorrhagia, distress, and abdominal discomfort. Furthermore, they can also cause acute abdomen due to torsion of a subserosal fibroid or red degeneration. Uterine myomas rarely cause hemoperitoneum, and the incidence or prevalence of hemoperitoneum due to ruptured vein is uncertain [3]. Here, the authors report a case of massive hemoperitoneum following rupture of a vein overlying a uterine myoma and review the relevant literature.

Case Report

A 28-year-old single, nulliparous, came to the present hospital seeking a second opinion after receiving a diagnosis of multiple uterine myomas of 13 cm in maximum diameter. She had noticed abdominal distention one year earlier and the swelling had increased two months prior to presentation. She was otherwise asymptomatic with an unremarkable past history. She had an irregular 16- to 40-day menstrual cycle and dysmenorrhea but no menorrhagia. She was advised to undergo myomectomy.

About two weeks later, she was admitted to the emergency department with acute lower abdominal pain that began after she had fallen onto her hip while snowboarding. There was diffuse abdominal pain with rebound tenderness and rigidity. The authors immediately established an intravenous line and administered saline and an appropriate amount of norepinephrine because she showed features of hypovolemic shock. Consequently, her general condition became stable. Urinary β-human chorionic gonadotropin test was negative. Her initial hemoglobin level was 9.8 g/dL. Transabdominal ultrasound revealed free fluid in the pelvic cavity, as well as multiple uterine masses. The authors determined the origin of the bleeding by CT because she was stable and prompt examination was possible using CT. Contrast-enhanced CT showed a high-density area in the pelvic cavity centering around the uterine myomas, and there was suspicion of bleeding originating from the uterine myomas (Figure 1). Hepatic and splenic injury was not detected. Her vital signs became unstable and the hemoglobin level dropped to 8.5 g/dL about one hour after arrival. Therefore, the authors decided to perform an

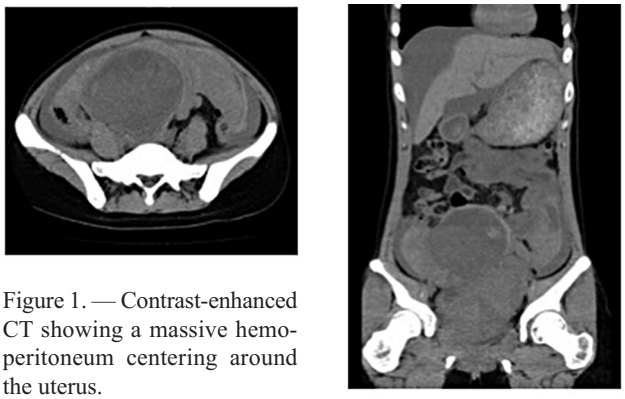

Figure 1. — Contrast-enhanced CT showing a massive hemoperitoneum centering around the uterus.

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Figure 2. — Gross findings. Ruptured vein on the surface of the myoma nodule.

emergency laparotomy. A midline vertical incision was made in the lower abdomen and massive hemorrhage was seen in the abdominal cavity; an extremely large hemoperitoneum was seen estimated at about 4,000 mL. Examination of the pelvis revealed multiple myomas and rupture of a superficial vein overlying a subserosal myoma on the fundus of the uterus, which measured approximately 13 cm in maximum diameter (Figure 2). Myomectomy was performed because she was nulliparous and wanted to have children. Four units of blood were transfused as her hemoglobin had dropped to 5.5 g/dL at the end of the operation, and her hemoglobin increased to 8.7 g/dL after transfusion.

She was observed in the intensive care unit for one day. The postoperative course was uneventful. Her condition improved and hemoglobin increased to 9.2 g/dL on postoperative day 7. She was subsequently discharged eight days after surgery.

Discussion

Uterine myomas occur in one out of every 4–5 women of reproductive age and it has been estimated that 20–50% of myomas are symptomatic. Common symptoms are metrorrhagia, menorrhagia, abdominal pain due to degeneration, and torsion of subserosal pedunculated myoma. Hemoperitoneum from rupture of vessels overlying a myoma is rare. The present authors searched the English-language literature from 1970 to April 2016 in PubMed by using the key words “hemoperitoneum” and “uterine myoma” or “fibroid”, and only 14 cases were found excluding pregnant women (Table 1) [4, 5, 7-16]. Seven of the 14 patients were primiparous, with the age of onset between 22 and 54 (median, 38) years. In many cases, patients visited the hospital with the chief complaint of acute abdominal pain, and two patients were taken to the emergency room in cardiopulmonary arrest. Size of the myoma is not likely to be a risk factor because hemoperitoneum occurred in a case with a uterine size roughly equivalent to that at ten weeks of gestation, as well as in a case with the uterus measuring 24×15×11 cm. A previous report found that the onset of vessel rupture associated with uterine myoma had no relationship with age, parity, or size of the myoma [4], as was the case in the present patient.

Various precipitating factors have been implicated in the

Table 1. — *Case reports of rupture of vessels overlying uterine myomas.*

Reference	Age	Parity	Symptom	Precipitating factor	Operation	Blood loss (mL)	Location	Type	Size of myoma	Vessel
[9]	45	1	Abdominal pain	None	Hysterectomy	500	Fundus	Subserous	10 weeks’ gestation (uterine size)	Vein
	49	2	Abdominal pain	Sitting quietly	Total hysterectomy	750	Fundus	Subserous	N.A.	Vein
[10]	39	2	Seizure	None	Myomectomy	Numerous large clots	Fundus	Subserous	6 cm	Vessel
[8]	34	0	Shock	Softball game	Myomectomy	3,000	Fundus	Subserous	22 cm	Vein
	44	2	Abdominal pain	Defecation	Hysterectomy	2,000	Fundus	Subserous	Larger than fist size	Artery
[11]	44	2	Epigastric pain	None	Myomectomy	3,000	N.A.	Subserous	6.5×6.0×4.5 cm	Vein
[4]	28	0	Abdominal pain	None	Myomectomy	3,500	N.A.	Subserous	24×15×11cm	Vein
[12]	38	0	Abdominal pain	None	Myomectomy	2,000	N.A.	Subserous	10 cm	Varices
[13]	48	3	Abdominal pain	None	Subtotal hysterectomy	2,000	Fundus	Subserous	14 cm	Artery
[7]	28	0	Cardiopulmonary arrest	None	Autopsy	1,600	Fundus	Subserous	10 cm	Vein
[14]	28	0	Abdominal pain	Bowel movement	Myomectomy	2,000	Fundus	Subserous	14- to 16-weeks’ gestation	Vein
[15]	36	3	Abdominal pain	Bowel movement	Myomectomy	1,500	Fundus	Subserous	15 cm	Vein
[16]	22	0	Abdominal pain	None	Myomectomy	3,000	N.A.	Subserous	13 cm	Artery
[5]	54	2	Cardiopulmonary arrest	N.A.	Myomectomy	3,000	Posterior wall	Subserous	6 cm	Arterial aneurysm

N.A., not available.

rupture of the vessels overlying the myomas. One of these is increased abdominal pressure resulting from trauma, as was seen in the present case, as well as physical exertion or bowel movement. Increased abdominal pressure may cause passive congestion of the superficial veins of the myoma, and consequently, rupture of the vessels [4]. Elevation of blood pressure during menstruation and pregnancy may be another cause. There is also a theory suggesting that the overstretching of the vessels during the growth of uterine myomas induces vessel rupture [5]. In a review of approximately 50 cases reported before 1961, it was suggested that the force of tension created on the surface of the tumor may tear a superficial vein and cause spontaneous bleeding as the tumor pushes itself out of the myometrial confines [6].

In all 14 cases shown in Table 1, myomas associated with venous rupture were the subserosal type and were mostly pedunculated [4, 5, 7-16]. Usually, many superficial vessels are present because the serosal layer is very thin. It is presumed that the superficial vessels of subserosal myomas are predisposed to rupture because they lack the muscular layer that protects the myoma from increased pressure, such as the layer overlying an interstitial myoma. In addition, it seemed that the vessels overlying the myoma readily overstretch.

In all cases shown in Table 1, the transfusion of blood was needed because of hypovolemic shock caused by extensive intra-abdominal bleeding. Mortality from hypovolemic shock has been reported [7]. Also in all cases, imaging tests including ultrasound and CT were performed and hemoperitoneum was diagnosed. However, it is difficult to detect the site of bleeding by imaging alone. In the present case, contrast-enhanced CT showed a high-density area around the uterine myomas and the present authors supposed that the bleeding was not from the liver or spleen. In previous reports, cases were often misdiagnosed as ectopic pregnancy or ovarian tumor [6, 8]. In the present case, ectopic pregnancy was excluded by a pregnancy test, but the authors could not rule out the possibility of injury to the mesentery before surgery, because this rare complication was not considered.

In conclusion, hemoperitoneum due to venous rupture overlying a uterine myoma is extremely rare. However, it is a life-threatening condition and therefore needs prompt surgical intervention. Thus, it is important to keep in mind the possibility of venous rupture overlying a uterine myoma when a female patient presents with acute abdomen and hemoperitoneum.

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