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Hemorrhagic shock due to ruptured left common iliac artery aneurysm during pregnancy

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Introduction

Massive obstetric hemorrhage is a major cause of maternal death and morbidity, with placenta previa, abruptio placentae, and postpartum hemorrhage representing the main causes [1]. However, there are also some reports of massive hemorrhage subsequent to ruptured aneurysm of the aorta or its branches during pregnancy. The diagnosis of unruptured aneurysms during pregnancy is so difficult that most aneurysms are recognized only after they have ruptured. A delay in the correction of hypovolemia or surgical treatment may lead to the death of the mother, the fetus, on both. This report describes the clinical course of a patient with hemorrhagic shock due to a ruptured aneurysm of the left common iliac artery, which could not be diagnosed preoperatively.

Case report

A 28-year-old woman with one previous pregnancy was referred to the Ishikawa Prefectural Central Hospital at week 30 of gestation because of abdominal pain and shock. She had no remarkable past history and her previous pregnancy and delivery had been uneventful.

There had been no abnormalities during this pregnancy, except that slight urinary sugar was detected at week 20 of gestation. On the morning of the third day of week 30, the patient suddenly felt severe back pain. She consulted an obstetrician, who was unable to find any abnormalities. As the lumbar pain worsened in the evening and her face lost color, the patient was brought to our hospital by ambulance.

On physical examination, she was conscious, but her face looked pale and the palpebral conjunctiva was anemic. She was sweating profusely. Her blood pressure was 62/20 mmHg and her heart rate was 120 bpm. However, no genital bleeding was found.

Blood examination showed a hemoglobin level of 6.4 g·dl^{-1} and a total protein level of 3.4 g·dl^{-1}. Chest X-ray showed no sign of intrathoracic bleeding. Abdominal echography performed by an obstetrician showed no evidence of obstetric bleeding, such as abruptio placentae. Because the fetal heart rate decreased to 40 bpm, an emergency cesarean section was performed without further investigation of the cause of the hemorrhagic shock.

On arrival at the operating room, her blood pressure was 60/10 mmHg and her heart rate was 125 bpm. Anesthesia was induced with ketamine 60 mg, and succinylcholine 90 mg was used to facilitate tracheal intubation. Anesthesia was maintained with sevoflulane (0.5%–1.0%) in 40% oxygen and 60% nitrous oxide using mechanical ventilation. Blood gas analysis revealed severe acidosis, with pH 6.98, $PaCO_2$ 33 mmHg, PaO_2 212 mmHg, base excess (BE) −20.2 mmol·l^{-1}, and HCO_3^- 7.8 mmol·l^{-1}. The hematocrit was below 15%.

Three minutes after incision, a neonate was delivered. The Apgar score was zero at 1 and 5 min. The neonate could not be resuscitated. There were no abnormalities in the uterus and intraperitoneum. A huge hematoma, however, was found in the retroperitoneum, which was caused by a ruptured aneurysm in the left common iliac artery. For about 30 min, until the abdominal aorta was clamped, the systolic blood pressure remained around 40 mmHg. The blood pressure increased to 80–120 mmHg after the aorta was clamped. An artificial vessel replacement was performed. The

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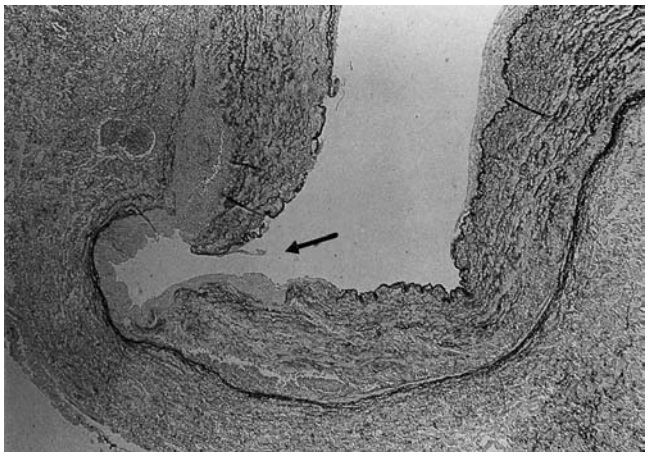

Fig. 1. Section of the left common iliac artery demonstrated that the internal elastic lamina was cracked (*arrow*) and dissection occurred at the lowest part of the tunica media. There was no reactive fibrosis in the vessel wall. Elastic fiber stain, ×40

blood loss during surgery was 4150 g. Eighteen units of packed red blood cells and 20 units of fresh frozen plasma were given during the operation.

At the end of surgery, her blood pressure was 110/70 mmHg and her heart rate was 95 bpm; blood gas analysis showed pH 7.53, $PaCO_2$ 35 mmHg, PaO2 156 mmHg (FiO_2 0.4), BE 6.5 mmol·l^{-1}, and HCO_3^- 29.2 mmol·l^{-1}. Mechanical ventilation was continued in the intensive care unit, and she was extubated 12 h after surgery. There were no neurological deficits, and her postoperative course was uneventful.

Pathological examination showed dissection of the lowest layer of the middle membrane of the left common iliac artery (Fig. 1). As a result, the patient received a diagnosis of rupture of a dissecting aneurysm of the left common iliac artery. There were no other pathological findings, such as cell infiltration or fibrosis in the internal, medial, and adventitia tunica.

Discussion

Although an arterial aneurysm during pregnancy is rare, it can be catastrophic if it ruptures. It mostly occurs in the third trimester, during labor, or in the early postpartum period. Pregnancy is related to the development of arterial aneurysm and or dissection. The hemodynamic and hormonal alterations that occur during pregnancy appear to be the cause of such arterial changes [2].

Pregnant women with Marfan's syndrome are well known to have a high risk of ruptured aortic aneurysm due to congenital abnormalities in their connective tissue. Therefore, in such patients, an assessment of aortic dilation with transesophageal echocardiography should be performed both before and during pregnancy. If progressive aortic dilation is found, therapeutic abortion or surgical intervention may be considered [3].

However, in pregnant women without such congenital disease, presupposition of the development of aneurysms is difficult, and follow-up cannot be conducted. Successful diagnosis and treatment of aneurysms prior to rupture during pregnancy is exceptional [4]. In our case of hemorrhagic shock due to a ruptured aneurysm, emergency surgical repair enabled us to save the mother.

In Japan, there have been few reports of ruptured aneurysm in pregnant women without congenital soft tissue disease. Furthermore, there are almost no descriptions in medical textbooks of dissecting aneurysms as an obstetric emergency. However, in recent years, some cases of ruptured aneurysm have been reported [5–7]. In the case of aneurysms of arterial branches, splenic artery or renal artery aneurysms are frequently reported. Ruptured aneurysms of the iliac artery in pregnant women, as in our case, are extremely rare [8–10]. The possibility of rupture of a dissecting aneurysm must be considered when we encounter hemorrhagic shock in a pregnant woman without obstetric hemorrhage. Early diagnosis and treatment of a ruptured arterial aneurysm are imperative to save the mother and fetus.

In summary, we have described a case of an emergency cesarean section and artificial vessel replacement in a pregnant woman with hemorrhagic shock due to the rupture of an iliac artery aneurysm. We must be aware of the possibility of rupture of a dissecting aneurysm when we come across a case of hemorrhagic shock with no findings at obstetric examination.

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References

1. Bonnar J (2000) Massive obstetric haemorrhage. Baillieres Best Pract Res Clin Obstet Gynaecol 14:1–18
2. Guillem P, Bondue X, Chambon JP, Lemaitre L, Bounoua F (1999) Spontaneous retroperitoneal hematoma from rupture of an aneurysm of the ovarian artery following delivery. Ann Vasc Surg 13:445–448
3. Elkayam U, Ostrzega E, Shotan A, Mehra A (1995) Cardiovascular problems in pregnant women with the Marfan syndrome. Ann Intern Med 123:117–122
4. Laubach MD, Van Tussenbroek F, Debing E, De Catte L, Foulon W (2000) Uterine artery pseudo-aneurysm: diagnosis and therapy during pregnancy. J Perinat Med 28:321–325
5. Ikeda E, Nawa S, Naitou M, Fujita Y (1997) A case of ruptured aneurysm of renal artery in late pregnancy (in Japanese with

English abstract). Nippon Sinzokekkangeka Gakkaizasshi (Jpn J Cardiovasc Surg) 27:118–120
6. Kosaka K, Okagaki M, Horie K, Simaoka M, Yokota H (1997) A ruptured of splenic artery aneurysm in pregnancy: a case of succeeding to save the mother and fetus (in Japanese). Nippon Sankafujinka Gakkaizasshi (Acta Obstet Gynaec Jpn) 49:343–346
7. Ishii S, Ozaki S (1998) A case of postpartum rupture of a renal artery aneurysm (in Japanese with English abstract). Nippon Sankafujinka Gakkaizasshi (Acta Obstet Gynaec Jpn) 50:967–970
8. Vo NM, Russell JC, Becker DR (1983) Ruptured iliac artery aneurysm: analysis of 56 cases. Conn Med 47:535–538
9. Barker SGE, Burnard KG (1989) Retrograde iliac artery dissection in Marfan's syndrome. J Cardiovasc Surg (Torino) 30:953–954
10. Nolte JE, Rutherford RB, Nawaz S, Rosenberger A, Speers WC, Krupski WC (1995) Arterial dissections associated with pregnancy. J Vasc Surg 21:515–520