

Fatal Retroperitoneal Hemorrhage in Pregnancy due to Screw-Related Vascular Injury After Kyphoscoliosis Surgery

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ABSTRACT

This case report presents a fatal maternal complication that occurred three years after kyphoscoliosis surgery in a 27-year-old primigravida. At 33 weeks of her first pregnancy, the patient developed a massive retroperitoneal hemorrhage secondary to spontaneous vascular injury caused by protruding pedicle screws from prior posterior spinal instrumentation. The increased intra-abdominal pressure and progressive uterine expansion during advanced pregnancy are thought to have exacerbated contact between the screw tips and the iliac vessels, eventually extending to the abdominal aorta. This catastrophic vascular injury precipitated a large retroperitoneal hematoma and subsequently triggered placental abruption, culminating in maternal mortality despite emergency surgical intervention. To the best of our knowledge, this represents a rare but critical obstetric complication in women with a history of complex spinal instrumentation. The case emphasizes the need for careful multidisciplinary prenatal surveillance, pre-delivery imaging of vascular and implant relationships, avoidance of excessive uterine pressure during delivery, and heightened awareness of screw-related vascular risks during pregnancy and cesarean planning.

Keywords: Congenital kyphoscoliosis, spinal instrumentation, screw-related vascular injury, pregnancy, cesarean

INTRODUCTION

Congenital kyphoscoliosis is a complex spinal deformity that is typically diagnosed in childhood or adolescence and is often surgically treated with posterior spinal fusion or instrumentation. These surgeries may permanently alter retroperitoneal and pelvic vascular anatomy.¹ Pregnancy in such patients poses both mechanical and systemic challenges, including reduced respiratory capacity, pain management difficulties, and complex delivery planning. Literature indicates a higher rate of Cesarean deliveries in such patients, although serious vascular complications are rarely reported.² This report discusses a fatal vascular injury in the third trimester of pregnancy and offers insights into the management of similar cases.

CASE REPORT

A 27-year-old primigravida at 33+2 weeks of gestation presented with complaints of hematemesis, chills, and constipation. She had a known history of congenital kyphoscoliosis and thoracolumbar spinal instrumentation. Her body mass index was 35 kg/m² with no history of hypertension

or diabetes. On admission, her vital signs were stable. Her hemoglobin level dropped from 9.2 to 8.6 g/dL during follow-up. NST was reactive, and BPP score was 8/8. Gastrointestinal bleeding was initially suspected. However, due to worsening abdominal pain and hemoglobin drop, an obstetric evaluation was performed with suspicion of placental abruption. Pelvic magnetic resonance imaging (MRI) revealed a retroperitoneal hematoma extending to the mediastinum, with normal placental structures. While preparing for surgery, the patient's condition deteriorated, and fetal bradycardia developed, prompting an emergency cesarean section (CS) (Figures 1, 2).

Intraoperative Findings

A CS was performed under general anesthesia. A 2200 g female infant was delivered (Apgar 3/7). Placental abruption was noted in approximately 50% of the placenta. While closing the uterus, a hematoma extending from the pelvis to the mediastinum was identified in the retroperitoneal space. Vascular surgery consultation was obtained. Dissection revealed a partial avulsion and arterial bleeding extending from the external iliac vein to the abdominal aorta. Despite vascular clamping, ligation, and surgical repair, bleeding could not be



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controlled. The patient received 5 units of RBC, 4 units of FFP, and 6 units of cell-saver blood. Despite resuscitation efforts, the patient suffered three cardiac arrests and was eventually declared deceased (Figures 3-5).

DISCUSSION

This case underscores how spinal deformities and previous surgeries can alter pelvic vascular anatomy, leading to life-threatening complications during pregnancy. Retroperitoneal hemorrhage in our patient was most likely provoked by screw-related vascular injury exacerbated by the gravid uterus. Imaging plays a pivotal role in diagnosis and preoperative planning. MRI is the preferred modality in pregnancy due to the absence of ionizing radiation and its ability to provide detailed soft tissue and vascular evaluation. However, MRI is limited by susceptibility artifacts created by metallic implants, which can obscure fine details. CT, in contrast, offers superior visualization of bony structures and implant positioning but involves ionizing radiation, which poses potential fetal risks and therefore is less desirable during pregnancy.^{3,4}

From an obstetric perspective, excessive fundal pressure, such as the Kristeller maneuver, should be strictly avoided in patients with spinal instrumentation due to the potential risk of exacerbating vascular compression and screw-related injury. Similarly, care must be taken to avoid undue uterine compression during cesarean delivery and fetal extraction, as increased intra-abdominal pressure may directly aggravate vascular contact with implants.⁵

This case highlights the importance of pre-delivery pelvic imaging in women with prior kyphoscoliosis surgery and posterior spinal instrumentation. Delivery should ideally be planned with a multidisciplinary team including obstetrics, perinatology, radiology, vascular surgery, and anesthesiology.



Figure 1. Coronal pelvic MRI demonstrating a large retroperitoneal hematoma extending cranially towards the mediastinum. The gravid uterus is displaced superiorly, and hematoma formation is visible adjacent to the vascular and spinal structures

MRI: Magnetic resonance imaging



Figure 2. Sagittal cervical-thoracic MRI showing posterior spinal instrumentation and altered vertebral alignment in a patient with congenital kyphoscoliosis. The presence of metallic screws causes susceptibility artifacts, partially obscuring visualization

MRI: Magnetic resonance imaging

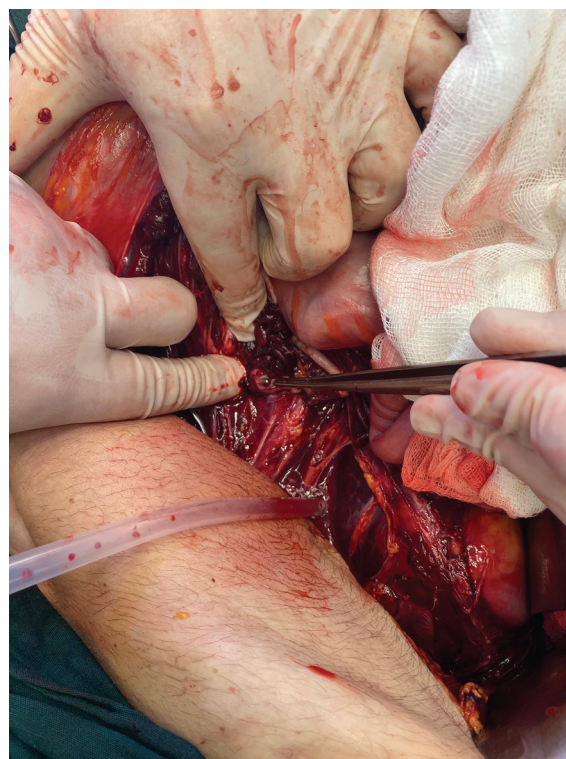


Figure 3. Intraoperative photograph during cesarean section showing protrusion of spinal instrumentation screws into the abdominal cavity in a patient with a history of kyphoscoliosis surgery

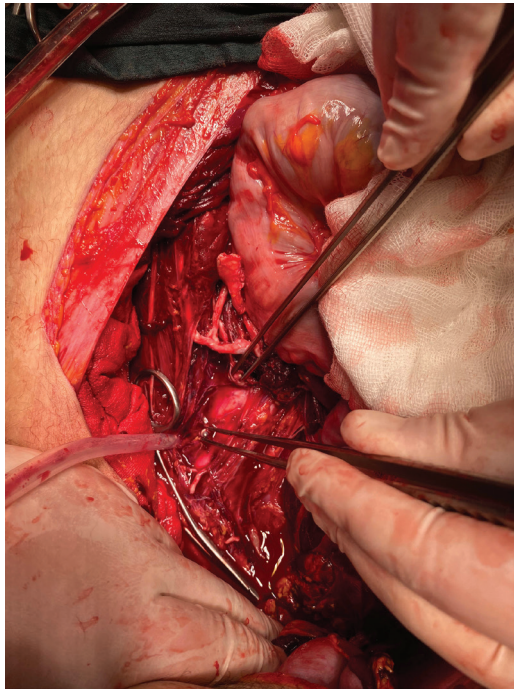


Figure 4. Surgical exploration demonstrating screw penetration in close proximity to the iliac vessels, contributing to retroperitoneal hematoma formation

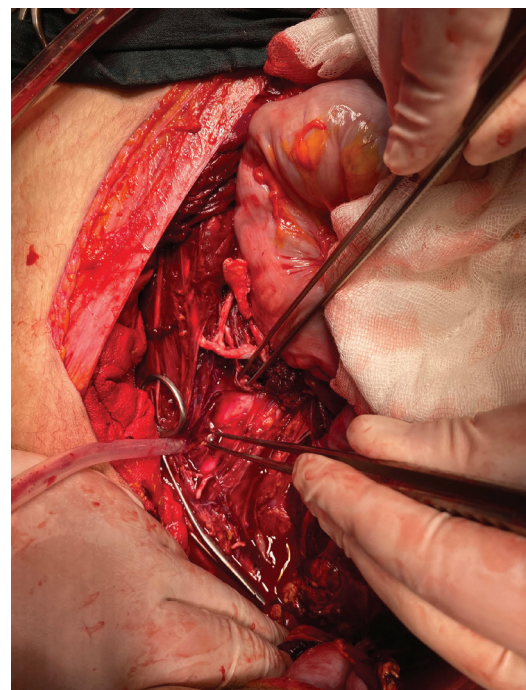


Figure 5. Intraoperative view revealing extensive vascular injury involving the iliac arteries and abdominal aorta caused by protruding pedicle screws, which subsequently triggered retroplacental hematoma and placental abruption

Ethics

Informed Consent: Written informed consent was obtained from the patient's family for publication of this case report and accompanying images.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.A., H.U., S.B., S.S.A., M.A.K., Concept: S.A., M.A.K., Design: S.A., Data Collection or Processing: S.A., H.U., S.B., S.Ö.Y., Analysis or Interpretation: S.A., Literature Search: S.A., H.U., S.Ö.Y., Writing: S.A., H.U.

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