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RESEARCH ARTICLE

ANEURYSM RUPTURE IN THE POSTPARTUM PERIOD: A CASE REPORT OF AN EXCEPTIONAL CASE

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Abstract

Aneurysm rupture is a rare but not exceptional cause of hemoperitoneum during pregnancy or the postpartum period. We report a fatal case of postpartum hemorrhagic shock in a patient with multiple aneurysm ruptures. The objective is, on the one hand, to draw the obstetrician‘s attention to non-obstetric causes of postpartum hemorrhage, and on the other hand, to provide a literature review on the subject.

Introduction:-

Aneurysm rupture is a rare but not exceptional cause of hemoperitoneum during pregnancy or the postpartum period [1]. It constitutes a life-threatening emergency requiring a multidisciplinary approach. We present a case of postpartum hemorrhagic shock in a patient with poly-aneurysmal disease.

Case Report

Mrs. M.L., 36 years old, had a medical history of poorly controlled arterial hypertension and was known to have poly-aneurysmal disease. She had previously undergone a left nephrectomy due to hemorrhagic shock following the rupture of a left renal artery aneurysm, which required emergency nephrectomy for hemostasis.

From an obstetric perspective, the patient was pauciparous, a mother of two children delivered vaginally. She had a history of therapeutic termination of pregnancy due to her vascular condition, following the decision of an ethics committee, with the insertion of an intrauterine device (IUD), which the patient later removed on her own initiative without adopting any other form of contraception.

The patient attended our facility at three months of pregnancy for follow-up. After a meeting with the ethics committee, the decision was made to proceed with a second therapeutic termination of pregnancy. However, the patient refused and was subsequently lost to follow-up, with no further pregnancy monitoring.

She gave birth vaginally at a level 2 hospital, deliberately withholding information about her medical and surgical history. She was readmitted in emergency 24 hours later, presenting with severe postpartum hemorrhagic shock. An exploratory laparotomy revealed a large retroperitoneal effusion. The patient was then referred to a level 3 center (university hospital) for further management.

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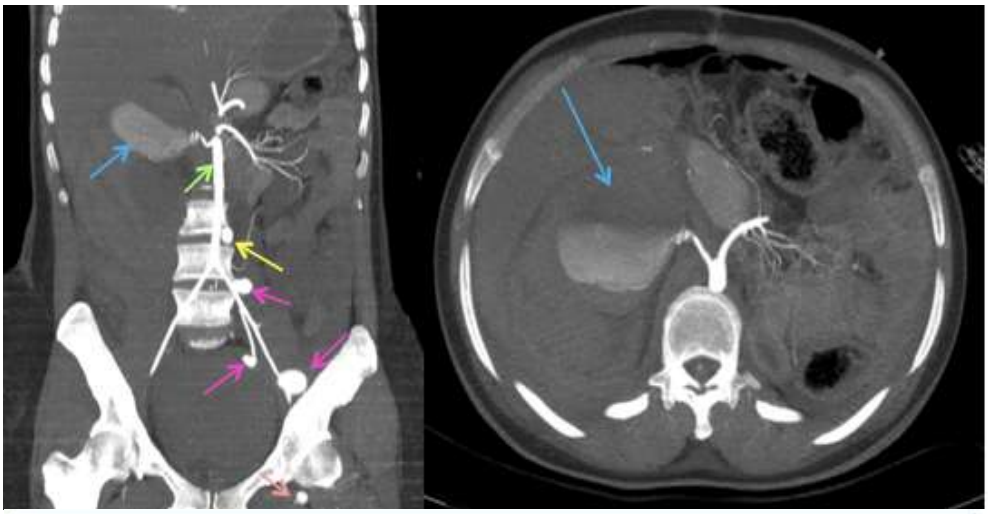
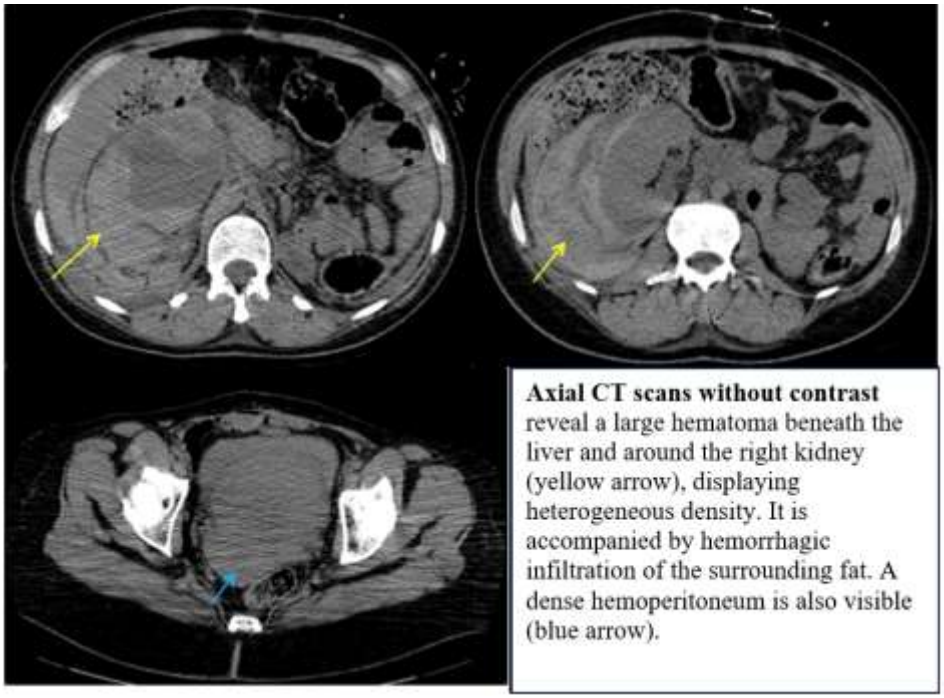
Upon admission, her blood pressure was 60/30 mmHg despite high doses of norepinephrine. Given her history of aneurysm, an angio-CT scan was performed, revealing:

1. A partially thrombosed aneurysm of the right renal artery, measuring 75 x 88 x 74 mm, complicated by rupture with a large peri-aneurysmal and peri-renal subhepatic hematoma.
2. Aneurysms of the inferior mesenteric artery (IMA), the right internal iliac artery, and the left primitive, internal, and external iliac arteries, some of which were partially thrombosed (Figure 1).
3. A moderate hemoperitoneum.



Coronal and axial CT scans with contrast injection reveal a large saccular aneurysmal dilation of the right renal artery, partially thrombosed (blue arrow), along with additional saccular formations involving the inferior mesenteric artery (yellow arrow), and the left common, internal, external iliac, and deep femoral arteries (pink arrows). The aorta appears small in caliber (green arrow), reflecting the patient's hemodynamic state.



Axial CT scans without contrast reveal a large hematoma beneath the liver and around the right kidney (yellow arrow), displaying heterogeneous density. It is accompanied by hemorrhagic infiltration of the surrounding fat. A dense hemoperitoneum is also visible (blue arrow).

Exploration revealed a large retroperitoneal hematoma within the renal compartment, covering active bleeding from a ruptured renal artery aneurysm, along with extensive intestinal ischemia due to a ruptured mesenteric artery aneurysm.

Given the presence of multiple aneurysms, the vascular surgeons opted for conservative management.

The patient underwent a right nephrectomy for hemostasis, with the placement of a drain in the right renal compartment. A multidisciplinary team (urologists, vascular surgeons, and visceral surgeons) performed a right hemicolectomy, and a decompressive stoma was also created. The patient was subsequently transferred to the intensive care unit.

Postoperative recovery was marked by a cardiopulmonary arrest due to refractory hemorrhagic shock that was unresponsive to vasopressors. Despite 30 minutes of appropriate cardiopulmonary resuscitation, the patient could not be revived.

Discussion:-

Aneurysm rupture in the postpartum period is rare but not exceptional, accounting for one-third of indirect maternal deaths in the postpartum phase [2]. Few cases have been reported in the literature. One proposed risk factor is the increased arterial flow caused by compression of the aorta and iliac vessels by the gravid uterus [1,3,4].

In pregnant women, the rupture rate for aneurysms smaller than 2 cm is approximately 62%, compared to only 2-5% outside of pregnancy [5,6]. Additionally, other congenital or connective tissue disorders involving vascular and systemic damage may lead to arterial connective tissue anomalies [1,2,3]. Our patient had no apparent congenital cause, and radiological imaging did not reveal any vascular malformation. Any artery may be involved—uterine, renal, splenic, etc. [1,3,4]. The distinct feature of our case is the multiple aneurysm locations (renal, iliac, and inferior mesenteric).

Digestive artery aneurysms are detected in only 0.01% to 0.2% of autopsies [7]. Splenic artery aneurysms are associated with pregnancy in 27% of cases, with a cumulative rupture risk in multiparous women [7]. As for aortic aneurysms, Yang G et al. [8] reported 11 cases over three years, 6 of which were discovered postpartum. Renal artery aneurysm rupture has been described in a pregnant patient with Ehlers-Danlos syndrome type IV [9]. However, our patient did not present any morphological features suggestive of Ehlers-Danlos syndrome.

Fibromuscular dysplasia is an idiopathic, non-atherosclerotic, and non-inflammatory systemic arteriopathy affecting small- and medium-sized arteries, most frequently the renal arteries. It is rare but must be considered, particularly in young women with renovascular hypertension, often the first symptom. Our patient had a history of poorly controlled arterial hypertension [10]. This condition could be a plausible etiology, particularly in a multimodal form.

In the third trimester, obstetricians often focus on common causes of abdominal pain, such as placental abruption or uterine rupture [11]. However, vascular abnormalities should also be considered, especially in cases of unexplained abdominal or pelvic pain, chest pain, dyspnea, or back pain [7].

Rupture may occur in one or two stages, explaining why hemorrhage can develop days after delivery [8,9]. Angiography is essential for both diagnosis and treatment. However, no consensus exists on the management of aneurysms discovered during pregnancy, as multidisciplinary collaboration and ethical deliberation are required. The treatment plan depends on the stage of pregnancy, aneurysm size, and the patient‘s consent.

There is no consensus on the optimal mode of delivery. While cesarean delivery does not prevent vascular rupture, it can minimize the risks associated with uterine contractions, hemorrhage, and hematoma formation [5,6]. In Yang G et al.'s study [8], 3 out of 11 women with aortic dissection underwent cesarean sections. Early therapeutic termination of pregnancy has been reported in various series [12,13]. Charlotte V.C. et al. [8] described a case of a 28-week pregnant woman with a uterine artery aneurysm rupture, successfully treated with embolization, allowing the pregnancy to continue [13].

Emergency splenectomy during pregnancy has been reported in more than 100 patients in the scientific literature, with maternal and neonatal mortality rates ranging from 75% to 95% [1].

In our patient‘s case, despite the nephrectomy and hemicolectomy performed for hemostasis and the implementation of hemodynamic resuscitation measures, the outcome was fatal due to multiple ruptured aneurysms in the renal and mesenteric arteries.

Conclusion:-

Postpartum aneurysm rupture is a life-threatening emergency that requires a multidisciplinary approach. Particular attention must be given to the patient‘s medical history for early identification and management of vascular anomalies.

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