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# Diagnosis and Management of Postpartum Retroperitoneal Hematoma: A Report of 3 Cases

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Data Collection B  
Statistical Analysis C  
Data Interpretation D  
Manuscript Preparation E  
Literature Search F  
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## Case series

**Patients:** Female, 35-year-old • Female, 28-year-old • Female, 29-year-old

**Final Diagnosis:** Retroperitoneal hematoma

**Symptoms:** Anemia • arterial hypotension • signs of hypovolemic shock • sudden onset abdominal pain

**Medication:** —

**Clinical Procedure:** —

**Specialty:** Obstetrics and Gynecology

**Objective:** Unusual clinical course

**Background:** The retroperitoneal hematoma is a very rare entity in obstetrics. A type of obstetric hematoma that extends into the retroperitoneal space, this hematoma usually occurs after laceration of the uterine artery, after uterine rupture, or by extension of a vaginal hematoma. Although the hematoma usually manifests as intense abdominal pain, sometimes the clinical signs can go unnoticed. This is the main reason it is important to report the cases in which retroperitoneal hematomas occur. In addition to clinical suspicion, experience in management can also help improve maternal morbidity and mortality from this cause.

**Case Reports:** We present a series of 3 clinical cases in which retroperitoneal hematomas occurred after instrumental deliveries. The 3 clinical cases described took place before the COVID-19 pandemic. In the first 2 deliveries, a vacuum was used, while in the third delivery, spatulas were used.

**Conclusions:** Our findings showed that suspicion is essential in patients with symptoms of nonspecific pain, as well as in patients with anemia that causes hemodynamic instability in the immediate postpartum period. The use of early computed tomography angiography in hemodynamically stable patients is essential to reach a diagnosis and to determine if the patient can be treated by embolization of the bleeding vessel.

**Keywords:** Embolization, Therapeutic • Hematoma • Maternal Mortality • Retroperitoneal Space

**Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/935787>

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## Background

Obstetric hematomas are a form of postpartum hemorrhage that are produced by the accumulation of hematic material in the connective tissue near the vagina, cervix, or parametrium in response to a vascular injury [1,2]. Obstetric hematomas are an uncommon entity, with a reported incidence rate in the literature from 1 in 300 to 1 in 1500 births [1,3,4]. This incidence can vary in different regions depending on the obstetric practices performed. A greater number of episiotomies and instrumental deliveries would be directly related to the increase in their incidence. Retroperitoneal hematomas are a rare type of obstetric hematoma that extend into the retroperitoneal space and usually occur after laceration of the uterine artery, after uterine rupture, or by extension of a vaginal hematoma [4,5].

Unlike hemorrhaging in other locations, retroperitoneal hemorrhaging can initially go unnoticed, presenting highly non-specific signs that make the condition considerably difficult to diagnose [1,2]. The onset of symptoms will depend on the increase in bleeding, manifesting as a sudden onset of abdominal pain, which might be accompanied by arterial hypotension or signs of hypovolemic shock [4].

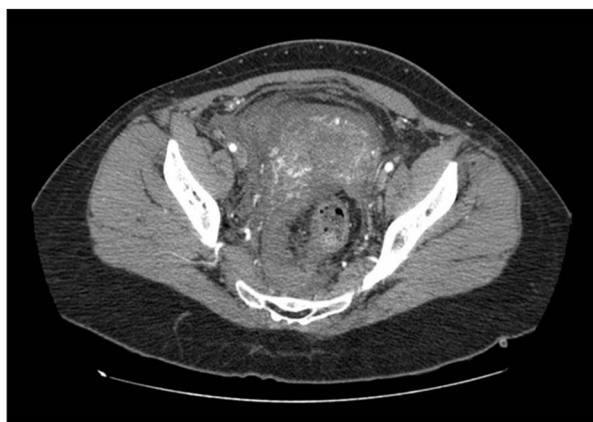
The diagnostic test of choice is computed tomography (CT) [5,6], with pelvic angiography being essential for hemodynamically stable patients for whom therapeutic embolization treatment is completed [4]. This technique is highly effective for resolving the symptoms but requires an expert practitioner because the procedure is not without complications [5].

Our main objective in this article was to report on a series of cases within the context of standard clinical practice in an obstetrics and gynecology department of a tertiary Spanish hospital. We also report the therapeutic diagnostic management carried out in each patient and review the established scientific literature on the subject. The reporting of cases will help raise awareness among gynecologists and obstetricians so they can recognize the retroperitoneal hematoma as a significant cause of morbidity and mortality, which requires high clinical suspicion and a multidisciplinary approach.

## Cases Reports

### Case 1

A 35-year-old woman with no relevant medical history underwent an induced labor owing to premature rupture of membranes at week 40 of pregnancy. After instrumental delivery (vacuum-assisted owing to the risk to the fetus's wellbeing) that was complicated by shoulder dystocia and resolved

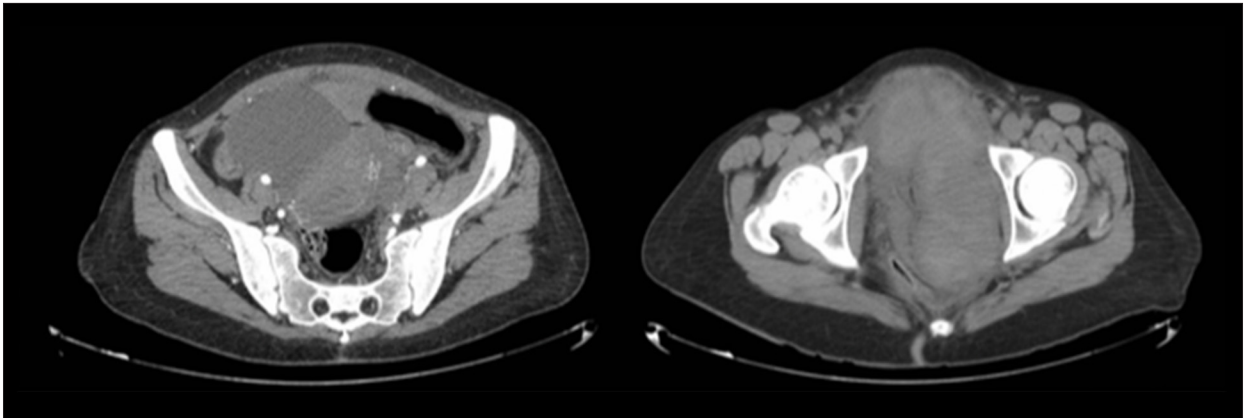


**Figure 1.** Case 1: abdominal and pelvic computed tomography angiography with contrast. A 10×7-cm hematoma on the right posterolateral wall of the vagina compresses and laterally displaces the rectum.

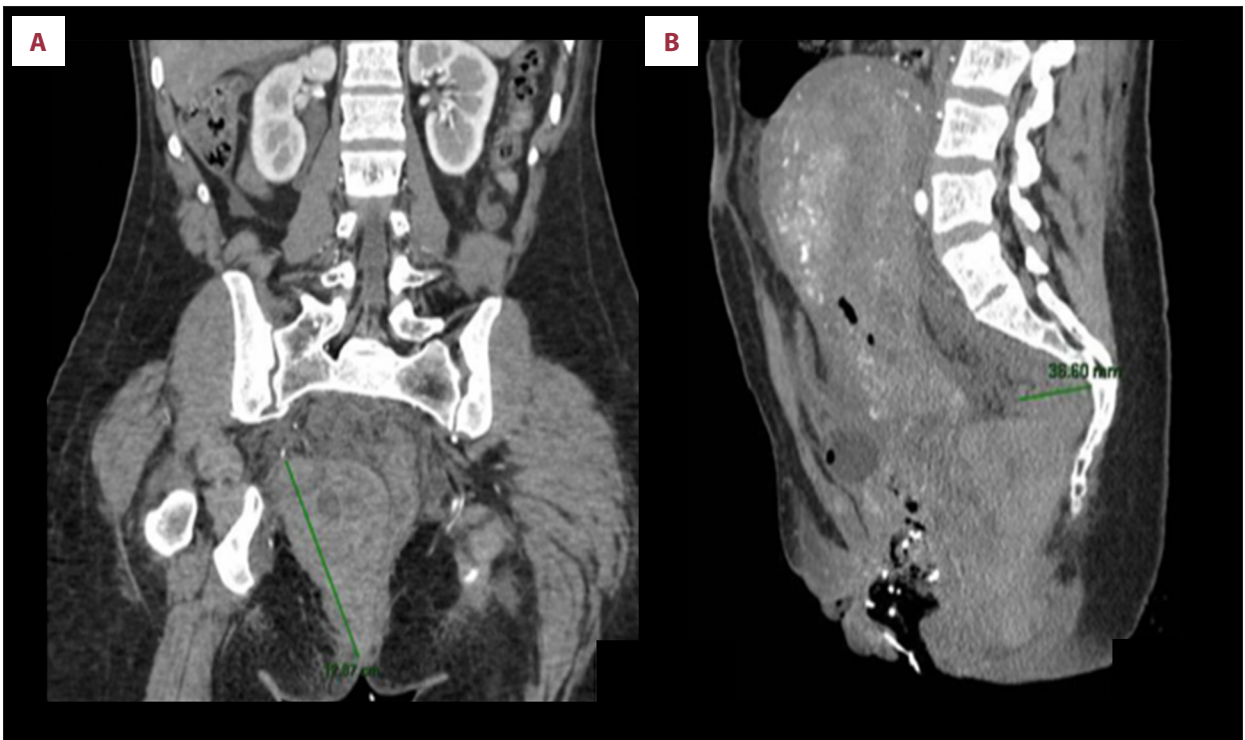
by primary maneuvers, the mother gave birth to a male infant weighing 3.405 kg. She was subsequently sutured for a grade II laceration without incident. In the immediate postpartum period, the patient presented anemia in the transfusion range. During the examination, a bulge was palpated in the posterolateral face of the vagina. There was also induration of the buttock. The patient underwent transvaginal and abdominal ultrasounds, which revealed a hematoma on the vaginal wall. CT angiography showed a hematoma on the right posterolateral wall of the vagina, measuring 10×7 cm, without identifying the origin of the bleeding (Figure 1). Given the patient's clinical and hemodynamic stability and the inability to locate the bleeding vessel, a conservative approach was decided upon, and the patient was transfused 3 units of packed red blood cells. Ultimately, based on the hematoma's stability in the follow-up CT conducted 16 h after the CT angiography, the patient's clinical improvement, and the absence of complications, the patient was discharged with a prescription for Augmentin (875 mg/125 mg, 1 tablet every 8 h as prophylaxis). During the follow-up 2 months after the episode, the patient was asymptomatic, and the examination revealed no findings.

### Case 2

A 28-year-old woman with no relevant medical history was admitted for labor. She underwent an instrumental delivery (vacuum-assisted owing to protracted labor) and gave birth to a male infant weighing 3.235 kg. In the immediate postpartum period, the patient had buttock pain and severe anemia, which persisted after the administration of 2 units of packed red blood cells. During the examination, a bulge that occupied the entire left lateral and anterior face of the vagina was palpated. Ultrasonography revealed a hematoma that could not be delimited, occupying the entire left hemipelvis. Given these findings, CT angiography was performed, indicating a



**Figure 2.** Case 2: abdominal and pelvic computed tomography angiography with contrast. A 16×10×19-cm retroperitoneal hematoma displaces bladder to the right, elevates the uterus, and collapses the sigmoid colon.



**Figure 3.** Case 3: abdominal and pelvic computed tomography angiography with contrast. A 6.4×11×13-cm hematoma on the right side of the pelvis displaces the vagina to the right (A). Uterus is increased in size in relation to the recent delivery and the image is compatible with a 3.7-cm blood collection in the presacral space; a gauze-compatible image can be seen inside the vagina (B).

retroperitoneal hematoma located in the lesser pelvis, occupying from the left lateral face of the vagina (collapsing the sigmoid colon and shifting the bladder) to the anterior wall of the abdomen and measuring 16×10×19 cm. No active contrast extravasation was observed (Figure 2). The patient was therefore not considered a candidate for embolization, and a conservative approach was decided upon. The patient was prescribed intravenous antibiotic therapy with Augmentin (1 g/8 h) and metronidazole (500 mg/8 h) and underwent antithrombotic

prophylaxis with heparin (20 mg/24 h), once the stability of the hematoma was confirmed in a follow-up CT scan. At 13 days after the birth, the hematoma spontaneously drained through the lateral face of the vagina. In the following days, the size of the hematoma decreased, and the patient was discharged, with the hematoma measuring 9.8×7.5 cm. During the follow-up at 2 months, the patient was asymptomatic, and the gynecological examination was normal.

### Case 3

A 29-year-old woman with no relevant medical history was admitted for premature rupture of membranes at week 37 of pregnancy. The woman underwent instrumental delivery (spatulas due to the risk to fetal wellbeing) and gave birth to a male infant weighing 3.280 kg. In the immediate postpartum period, the patient had hypogastric pain, active vaginal bleeding, and anemia in the transfusion range. The patient underwent an examination under anesthesia, which revealed a 4-cm laceration in the right lateral face of the vagina, as well as a bleeding vessel. The vessel was sutured and vaginal tamponade was performed. Given the lack of improvement and worsening anemia after the transfusion of 2 units of packed red blood cells, a CT was performed, revealing a retroperitoneal hematoma measuring 6.4×10×10.5 cm (Figure 3) and identifying the origin of the bleeding as coming from a branch parallel to the uterine artery and from a pudendal branch. Selective embolization of these vessels was performed, accessed by the left radial artery, with 2 vials of 250-micron microparticles. The patient was prescribed antibiotic therapy with intravenous Augmentin (1 g/8 h) and antithrombotic prophylaxis with Clexane (40 IU/24 h). The patient's condition progressed favorably, with a reduction in hematoma size (observed in a follow-up CT scan), and she was discharged at 20 days after the birth in good general condition and without anemia, per the laboratory test results. A follow-up CT scan was performed at 8 months after the embolization, and no residual hematoma was observed.

### Discussion

Retroperitoneal hematomas are an uncommon condition in the postpartum period but can be life-threatening if not detected in a timely manner [1,6]. Although episiotomies and instrumental deliveries have been the risk factors most closely linked to obstetric hematomas, there are other factors related to this condition, such as primiparity, fetal macrosomia, protracted labor, coagulation disorders, and varicose veins in the genital tract [6]. The 3 cases presented here have in common that the complication occurred after an instrumental delivery with fetal weights greater than 3000 g. In cases 1 and 3, an episiotomy was performed, and in case 2, a second-degree tear occurred.

In terms of its etiology, the formation of the hematoma is not only due to direct trauma of the tissues but also to tissue necrosis produced by the extrinsic compression of the blood collection itself [2,7]. In those cases in which there is some maternal coagulopathy or the vascular repair during the suture was not effective, inadequate hemostasis will perpetuate the growth of the hematoma [7]. In case 3, the patient underwent an examination under anesthesia, which revealed a 4-cm laceration in the vagina with a bleeding vessel, which was sutured.

Diagnosing a retroperitoneal hematoma in the postpartum period is not an easy task owing to the nonspecific clinical manifestations, low incidence, and few references in the literature regarding its identification. Locating the hematoma is therefore essential, not only to establish the diagnosis but also to predict the possible progression of the symptoms [7]. Vaginal hematomas, such as those that occurred in the first 2 cases, located between the urogenital diaphragm and the levator ani muscle, are due mainly to injuries to the descending branch of the uterine artery and tend to extend laterally toward the perineum and rectum. These hematomas can therefore be recognized in an examination as a fluctuating and highly painful swelling (when palpated) that protrudes from the vaginal wall [8]. In addition to vaginal palpation, the most characteristic manifestation of the retroperitoneal hematoma is acute and high-intensity pain that occurs within 24 h of childbirth and, if left to progress, is accompanied by signs of hypovolemia [6-8].

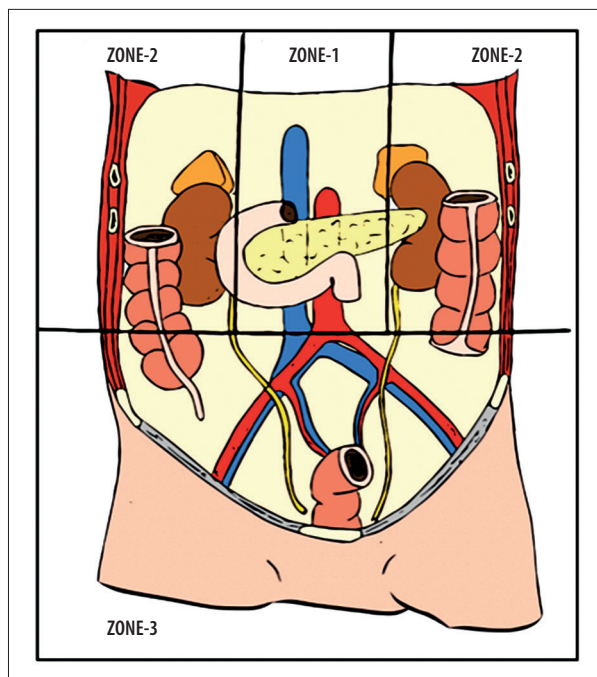
Regarding the presence of hypovolemic shock, the acute anemia experienced by the patients in all 3 reported cases necessitated the transfusion of between 2 and 3 units of packed red blood cells.

By contrast, if the location of the hematoma is above the levator ani muscle, the hematoma can extend toward the broad ligament or toward the retroperitoneal space, as occurred in our case 3 [8,9]. This type of injury is usually located in the uterine artery or in one of its branches and is frequently associated with cervical lacerations, vaginal cul-de-sac lacerations, and suture dehiscence of these lacerations.

In certain cases, the hematomas are secondary to rupture of the lower uterine segment [8]. The symptoms in these cases are fairly nonspecific and start with symptoms of hypovolemia or, in other cases, continuous hypogastric pain associated with signs of abdominal guarding [7,9]. The rupture of the lower uterine segment, reported as a possible cause of hematoma in the literature, was not corroborated in any of the cases presented here.

In cases of large hematomas, vaginal palpation can provide evidence of uterine deviation toward the side contralateral to the hematoma [9].

When there is a clinical suspicion, the first test should be ultrasonography. If the results are not diagnostic, the imaging technique of choice is CT [10]. Pelvic angiography is essential for hemodynamically stable patients because it will indicate the location of the vascular laceration or bleeding point, which will be shown through contrast extravasation [9,10]. Identifying the pelvic vascular map is required before any procedure, with the aim of determining the anatomy of the uterine arteries and their collaterals [10]. CT was performed in all



**Figure 4.** Retroperitoneum division zones: Zone 1: initial surgical management. Zones 2 and 3: conservative treatment can be chosen in certain situations. (Redondo et al.).

3 of our patients to identify, as indicated in the literature, the possible presence of active bleeding as well as the location of the hematoma.

Historically, retroperitoneal hematomas have had an initial surgical approach. Currently, the surgical or conservative approach will depend on the etiology, size, extent, and, above all, location and hemodynamic stability [7,9,10]. None of our patients required surgery since they were hemodynamically stable. Also, in case 3, in which active bleeding was observed, embolization was effective.

To determine the need for surgery, we need to consider the location of the hematoma, which will suggest the underlying vascular injury and the patient's hemodynamic state, which, if unstable, will make surgery the chosen approach. In terms of location, the retroperitoneum is divided into 3 zones [3,7] (**Figure 4**): the first (zone 1) includes the midline retroperitoneum; the second (zone 2) includes the perinephric space; the third (zone 3) includes the pelvic retroperitoneum. Therefore, zone 1 injuries require an initial surgical management owing to the high probability of vascular injury. Injuries in zones 2 and 3 are eligible for conservative treatment in hemodynamically stable patients who do not present with an increasing lesion size and lack signs suggestive of compartment syndrome [3,7,9].

Due to its greater safety index and precision, percutaneous artery embolization is the alternative choice to open surgery,

provided the patient is hemodynamically stable [10]. The aims of percutaneous artery embolization, after identifying the bleeding vessel, are selective catheterization and embolization of the most distal artery possible [9,11,12]. These goals are not always achievable, however, and in certain circumstances, such as when there is no contrast extravasation in the angiography (due to intermittent bleeding, arterial spasticity, or vasoconstriction), bilateral embolization of the uterine arteries should be performed, because if it is performed unilaterally, repermeabilization can occur through collateral branches, thereby resulting in the reappearance of the bleeding [12]. Gelatin foam is the most widely used embolic agent owing to the clinical experience using it and its low cost [12]. Thanks to its resorbable nature, the foam allows for the preservation of arterial perfusions and fertility [13-15].

When hemostasis using transcatheter embolization techniques is not effective (typically due to the presence of anatomical variations), surgeons can opt for ligation through laparotomy of the uterine artery or the internal iliac artery [13]; however, the success rates do not exceed 83% [15,16].

Lastly, in those cases in which a conservative approach is opted for in hemodynamically stable patients, postpartum prophylactic antibiotic therapy might be indicated to prevent superinfection of the hematoma, although there are no recommendations that endorse its generalized use. In all 3 of our cases, prophylactic antibiotic therapy was prescribed to prevent superinfection of the hematoma. Although there is no agreed guideline, we propose that it should be done based on the antimicrobial resistance of each center. We believe that the antibiotics used in each of our patients were effective since none had fever spikes or analytical signs of infection.

In addition, the use of low-molecular-weight heparin at prophylactic dosages once the symptoms have stabilized appears appropriate given that the prothrombotic state of the postpartum period adds to the patient's immobility due to this complication, which, together with blood loss greater than 1 L, increases the risk of postpartum thrombotic events [17].

## Conclusions

Based on our findings, we conclude that the diagnostic suspicion of a retroperitoneal hematoma is essential in patients with symptoms of nonspecific pain located in the hypogastrium, vagina, or buttock, as well as in patients with anemia that causes hemodynamic instability in the immediate postpartum period. This clinical suspicion should be increased in instrumental deliveries, such as the 3 cases that we have presented, or if an episiotomy has been performed. Performing CT angiography early in hemodynamically stable patients, as

was done in the 3 cases that we have presented, is essential to reach a diagnosis and to determine if the patient is a candidate for treatment by embolization of the bleeding vessel. In non-subsidiary cases of embolization in which a conservative approach is chosen, the use of antibiotic therapy to prevent superinfection of the hematoma is useful, as is the use of low-molecular-weight heparin to avoid thromboembolic events in these patients. Both of these resources were used in the patient in case 2.

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