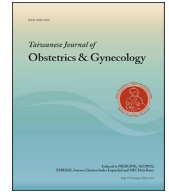




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Case Report

Managing vulvovaginal hematoma by arterial embolization as first-line hemostatic therapy

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ABSTRACT

Objective: A puerperal vulvovaginal hematoma may continue to grow after a surgical procedure and may require blood transfusion. Thus, we selected arterial embolization for hemostasis as the first-line management in two cases of large vulvovaginal hematoma.**Materials and methods:** Case 1 was a 32-year-old pregnant woman. After delivery, a 10-cm vulvar hematoma developed. An enhanced computed tomography (CT) scan revealed active bleeding. Arterial embolization was performed and complete hemostasis was obtained. Case 2 was a 34-year-old woman with a recurring hematoma after delivery. An enhanced CT scan revealed extravasation in the hematoma. Gelatin sponges were applied and complete hemostasis was obtained. In both cases, arterial embolization was successful without requiring blood transfusions.**Results and conclusion:** We successfully managed two cases of puerperal vulvovaginal hematoma by arterial embolization based on the evaluation of an enhanced CT scan. In conclusion, we suggest arterial embolization to be a viable option for first-line treatment in the management of vulvovaginal hematomas.© 2017 Taiwan Association of Obstetrics & Gynecology. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Postpartum birth canal hematomas are potentially a life-threatening complication during an obstetric emergency. Vulvovaginal hematomas often develop on the ipsilateral side of the episiotomy site. However, hematomas may also develop on the contralateral side of the episiotomy. Vulvar or vulvovaginal hematomas are usually upwardly restricted by the pelvic fascia and levator muscles that create the compartment. Thus, the size of a hematoma is mostly self-limiting but causes excruciating pain due to the increased pressure on the tissue.

Management of vulvovaginal hematomas [1] is usually optimal if the size of the hematoma is small or moderate. However, if the hematoma continues to grow, surgical intervention may be required by ligation of the bleeding vessels. Unfortunately, hematomas often develop again after the surgical procedure and embolization may be the only option for second-line treatment.

We report two cases of management of puerperal vulvovaginal hematoma. In both cases, we performed arterial embolization as the first-line hemostatic therapy and were successful in attaining hemostasis. Therefore, we suggest elective arterial embolization as a viable option for first-line treatment in the management of vulvovaginal hematomas.

Case Reports

Case 1

The patient was a 32-year-old gravida 1, para 1 woman admitted to another obstetric facility for the induction of labor at 41 weeks of gestation due to prolonged pregnancy. Labor was induced by intravenous oxytocin infusion and the patient vaginally delivered a healthy neonate without complications. The median episiotomy was sutured. Total bleeding was 372 g up to the end of the third stage of labor. About 1 hour after delivery, she complained of pain in the perineal area and the physician found a vulvar hematoma measuring 10 cm in diameter. Her blood pressure was 130/80 mmHg and her complete blood count showed a hemoglobin (Hb) level of 10.6 g/dL. She complained of severe pain in her perineum

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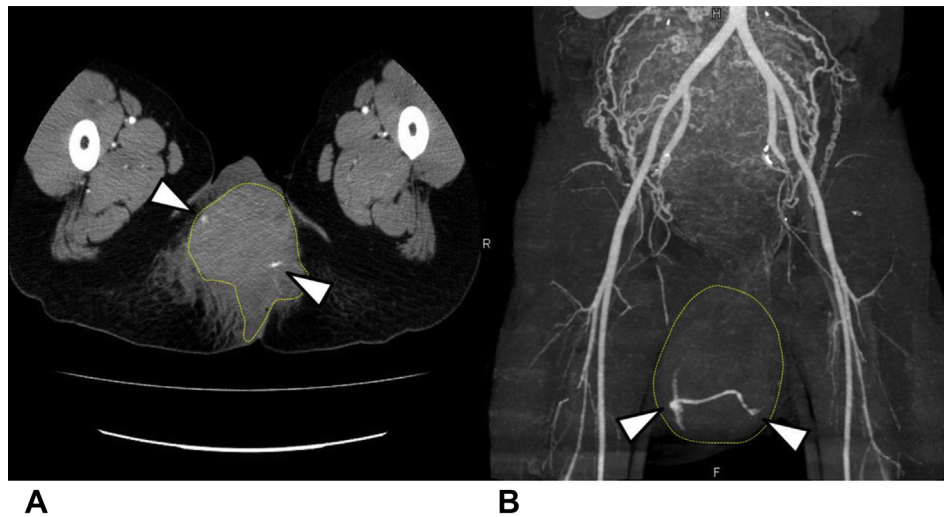


Figure 1. Contrast-enhanced computed tomography scans before artery embolization. (A) Axial image. (B) Coronal maximum intensity projection image. Arrows show the extravasations of the contrast medium in the bilateral side of hematoma. The hematoma is outlined in yellow. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

and a hematoma that had developed was gradually increasing in size and she was transferred to our institution.

At admission, she was alert with a blood pressure of 110/69 mmHg and a heart rate of 80 beats/min. Initial laboratory test data revealed a Hb level of 10.2 g/dL. Emergency enhanced computed tomography (CT) was performed at arrival in the emergency ward and a vulvovaginal hematoma (10 cm in diameter) was observed below the levator ani muscles with active extravasation at the right anterior side of her vulva (Figure 1).

We selected embolization as the first-line method to achieve hemostasis. Angiography revealed the bleeding vessel and was confirmed to be in the branch of the right internal pudendal artery. Gelatin sponges were applied by catheter and complete hemostasis was obtained. The following day, the hematoma was opened and a 307-g blood clot evacuated. Her vulval pain was relieved immediately after the procedure. Blood loss during the procedure was 100 g and a Penrose drain was inserted to speed up the healing process. Her postoperative blood Hb level was 8.1 g/dL. She was discharged from our hospital at 6 days postpartum without complications.

Case 2

A 34-year-old primiparous woman had been under the care of another obstetric facility and, at 39 weeks and 3 days of gestation, she had a normal vaginal delivery. During the crowning of the fetal head in the course of labor, a subcutaneous hematoma, 6 cm in diameter, developed on the left side of the vulva. Thus, a left mediolateral episiotomy was performed. After delivery, the episiotomy was repaired and the hematoma was opened once and sutured. However, soon after delivery, the hematoma recurred at the same site and gradually became enlarged. The total amount of blood loss following the procedure exceeded 800 g and she was transferred to our institution.

At arrival, her blood pressure was 124/77 mmHg and her pulse rate 87 beats/min. She was alert and complained of severe vulval pain. For our initial evaluation, emergency enhanced CT was performed and revealed extravasation of the contrast medium into the hematoma. The location of the hematoma was confirmed to be the left paravesical space below the levator ani muscles (Figure 2).

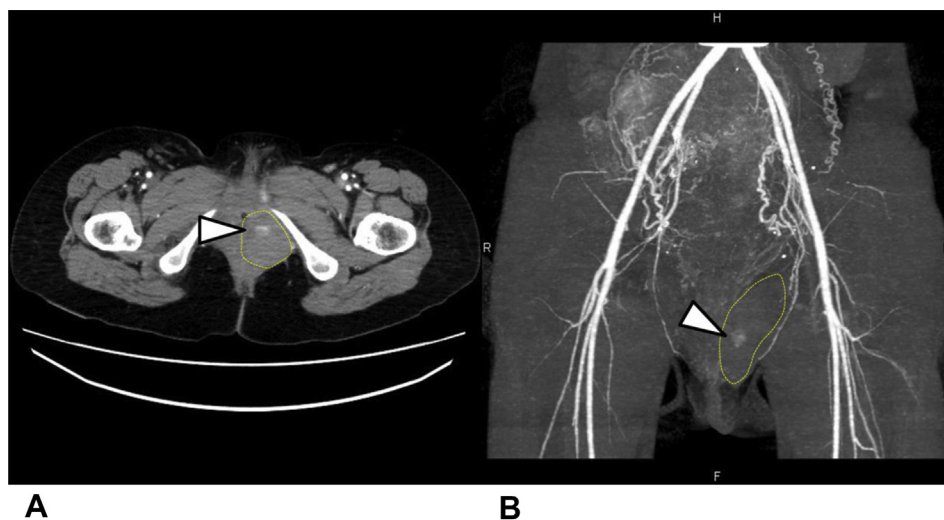


Figure 2. Contrast-enhanced computed tomography scans before artery embolization. (A) Axial image. (B) Coronal maximum intensity projection image. Arrows show the extravasation of the contrast medium on the ipsilateral side of the hematoma. The dashed yellow line indicates demarcation of the hematoma. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Thus, we decided to perform emergency arterial embolization as the first-line treatment.

Angiography identified the bleeding vessel to be the left internal pudendal artery and gelatin sponges were introduced by catheter and complete hemostasis was obtained. Two days later, under anesthesia, the hematoma, approximately 6 cm in diameter, was opened through the episiotomy wound and was resutured. During the procedure, blood loss was 21 g and her postoperative Hb level was 8.2 g/dL. Blood transfusion was not required and her vulval pain disappeared soon after the operation. She was discharged from our institution on the following day.

Discussion

We treated two cases of postpartum vulvovaginal hematoma successfully with embolization as the first-line hemostatic therapy. Vulvar hematoma involves the vestibular bulb or branches of the pudendal artery: the posterior rectal, perineal, and posterior labial arteries [1]. Paravaginal hematomas may involve a branch of the descending uterine arteries. These hematomas are usually restricted to upward invasion because of the pelvic fascia and levator ani muscles that create the compartment. Thus, the size of a hematoma is mostly limited unless it ruptures, in which case it causes excruciating pain due to the increased pressure on the tissue. Usually, first-line management of a vulvovaginal hematoma is successful if the size of hematoma is small or moderate. However, if the hematoma continues to grow, surgical intervention is required. Hemostasis may be obtained by ligation of the bleeding vessels, if possible, or if the hematoma cavity is sutured with or without vaginal gauze packing. Unfortunately, identification of the bleeding vessel may be difficult and excessive bleeding requires a blood transfusion. Sometimes, another hematoma develops and embolization is the option for second-line treatment [2,3]. At present, it is rare to perform an emergency arterial embolization in the management of vulvovaginal hematoma as first-line treatment.

Our strategy for managing puerperal hematoma, if the patient's status is stable, is to perform enhanced CT for initial evaluation. Following the identification of the type of hematoma and the presence of bleeding vessels, we recommend methods for hemostasis, if required. Our basic criteria for starting intervention follow the classic criteria for a surgical approach to severe pain and/or a large or growing hematoma. In addition, we recommend embolization if enhanced CT indicates active bleeding but the bleeding vessel is difficult to identify or is suspected of having multiple foci.

Villela et al [4] reported two cases of successfully managing vulvovaginal hematomas by applying interventional radiology. In one case, initial surgical repair was not successful and embolization was performed. In the other case, vulvovaginal hematoma developed following a vacuum delivery and vaginal gauze packing was applied to reach hemostasis. However, hemostasis was not obtained and embolization of the superior gluteal, internal pudendal, and obturator arteries successfully controlled the bleeding. Both

cases required large-volume blood transfusion during the treatment. Distefano et al [3] reported a successfully managed case of puerperal hematoma using arterial embolization as the first-line hemostasis. They performed enhanced CT first and found a supralevator hematoma of 10 cm in diameter that led to their decision.

In both of our cases, blood transfusions were not required during or after the treatment because we did not open the hematomas until hemostasis had been obtained. To obtain surgical hemostasis, the hematoma is opened, the blood clots removed, and the bleeding vessels are identified for ligation. However, by opening the hematomas, the pressure in the hematoma is decreased and bleeding recurs. Usually, it takes time to identify the bleeding site. Thus, during the procedure, bleeding continues until the bleeding vessel is ligated. Even if surgical intervention is selected, initial enhanced CT may identify the bleeding site or vessel before starting a procedure. According to Dahdouh et al [5], a growing hematoma displaces structures including blood vessels and so the anatomical situation may have changed. Surgical intervention may become difficult in such cases but arterial embolization is useful in such situations. It has been reported that the success rate for management using embolization may be as high as 70–80% [6,7].

In conclusion, we recommend initially performing enhanced CT examination to identify the location of a hematoma and bleeding vessel and, if an actively bleeding vessel is confirmed, emergency arterial embolization should be selected as the first-line treatment to obtain hemostasis. After hemostasis has been obtained, the hematoma should be opened and drained.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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