

Surgical management of non-obstetric vulvar hematoma in a pediatric patient: A Case Report

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ABSTRACT

Introduction: Vulvar hematoma is an uncommon condition in pediatric patients, often caused by blunt trauma to the perineum. Its management differs from that in adults due to children's anatomical and physiological characteristics. Proper diagnosis and treatment are essential to prevent complications such as necrosis, infection, or recurrent bleeding.

Methods: An 11-year-old girl presented with pain and swelling in the genital region following a fall in a sitting position with a mobile phone underneath her. Physical examination revealed a right-sided vulvar hematoma measuring 7×7×5 cm. Due to the progressive enlargement and pain, surgical evacuation was performed under anesthesia, followed by drainage and wound suturing with Vicryl 2.0 thread. Postoperative management included pediatric co-treatment, analgesics, and antibiotics.

Results: The patient showed significant improvement within three days post-surgery, with a reduction in swelling and pain. The drain was removed on the second postoperative day, and wound healing progressed well without complications. The case emphasizes the importance of prompt intervention to prevent pressure necrosis and infection, especially in large hematomas or those with progressive symptoms.

Conclusion: Non-obstetric vulvar hematoma, although rare in children, requires prompt evaluation and management. Surgical evacuation is recommended for large or progressively enlarging hematomas to prevent necrosis and other complications. Appropriate surgical technique, postoperative care, and interprofessional collaboration ensure optimal patient outcomes.

Keywords: Adolescent; Hematoma; Surgery; Trauma; Vulva.



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INTRODUCTION

A hematoma is a soft mass caused by the accumulation of blood due to trauma to subcutaneous soft tissue. The vulva consists of soft tissue composed mainly of smooth muscle and loose connective tissue and is innervated by branches of the pudendal artery. Although vulvar hematoma is a common obstetric complication, it can also occur outside the obstetric context (O'Brien *et al.*, 2022). Vulvar hematoma is often observed as a result of blunt trauma to the genitalia, which can be caused by a variety of factors, including postpartum injury, physical violence, sexual intercourse, and injury from falls with legs astride. In cases of non-obstetric trauma involving the female genitalia, the incidence of vulvar hematoma is reported to be around 30% accompanied by urologic injury (Pratama *et al.*, 2024).

In children, the reported incidence ranges from 0.2 - 8%, with the majority of injuries (73-82%) occurring due to blunt injuries and a smaller proportion occurring due to penetrating trauma (Bergus *et al.*, 2024). Therefore, a thorough clinical examination of the urethra is essential, and urethral catheterisation should be performed before any corrective measures are taken. Traumatic injuries to the vulva can vary in severity, from mild to severe (Rotinsulu and Ati, 2025). Due to the abundant blood supply and absence of valves in the perineal veins, the chance of a significant hematoma is high. Perineal pain is the main symptom that prompts clinicians to examine patients with suspected postpartum genital hematoma. In obstetric cases, early recognition is essential to reduce associated morbidity, improve patient clinical outcomes, and shorten hospital stay (Golbasi *et al.*, 2021).

Recent case reports have highlighted the increasing incidence of non-obstetric vulvar hematomas in pediatric and adolescent populations, often related to recreational accidents or domestic trauma (Syaharuddin, Fardi and Damayanti, 2025). However, the literature remains limited regarding standardised management approaches. Conservative treatment may be sufficient for small, stable hematomas, yet larger lesions with progressive pain or swelling typically require surgical intervention. In resource-limited settings, timely surgical evacuation can be lifesaving, reducing the risk of hemodynamic instability and promoting faster recovery (Kurakula *et al.*, 2023). The novelty of the current discussion lies in emphasising age-specific anatomical vulnerability and the critical role of early surgical decision-making in adolescent patients, aspects that are often overlooked in general gynecologic trauma literature (Imai *et al.*, 2025).

Moreover, adolescent genital trauma presents psychosocial implications, including embarrassment, fear, or parental anxiety, which can delay presentation to healthcare facilities. Addressing these barriers through empathetic communication and multidisciplinary care involving pediatric and surgical teams enhances both physical and emotional outcomes. Understanding the interplay between anatomical immaturity, vascular fragility, and the psychosocial context of adolescence contributes to a more comprehensive approach to care. Therefore, this report aims to discuss the pathophysiology, clinical features, and management of vulvar hematoma in adolescents following non-obstetric trauma, emphasizing the importance of prompt surgical evacuation in significant or progressive cases. By integrating recent evidence and clinical experience, this article contributes novel insights into improving diagnostic awareness and therapeutic outcomes in pediatric gynecologic trauma.

RESEARCH METHODOLOGY

This study employs a case report design to present, describe, and analyse a single instance of a non-obstetric vulvar hematoma in a pediatric patient. Case reports are appropriate for highlighting rare clinical conditions and contributing to the existing body of medical knowledge by detailing the diagnostic and therapeutic processes involved.

Patient and Case Description

An 11-year-old female patient presented with genital pain, swelling, and redness following a fall in a sitting position with a mobile phone accidentally positioned between the floor and her genital region. The symptoms progressively worsened over 12 hours before hospital admission. After a 6-hour observation period with increasing pain and swelling, surgical intervention was deemed necessary.

Clinical and Diagnostic Assessment

A comprehensive physical examination revealed a right vulvar swelling (oedema) approximately $7 \times 7 \times 5$ cm in size, with bluish discoloration of the labia majora. No active external bleeding was noted. Preoperative evaluation included a general physical examination, local inspection, and assessment for potential urinary retention or hemodynamic instability. Laboratory investigations (complete blood count and coagulation profile) were conducted as indicated to ensure surgical safety.

Surgical Procedure

Under aseptic conditions and appropriate anaesthesia, hematoma evacuation was performed using a No. 15 scalpel blade. A 3 cm incision was made at the mucocutaneous junction of the right labia majora, followed by evacuation of approximately 30 cc of clotted blood. After hemostasis was achieved, a drain was inserted and subsequently removed on the second postoperative day. The incision site was sutured using Vicryl 2-0 absorbable thread.



Figure 1. a-d. (a) Vulvar hematoma. (b) Intraoperative vulvar hematoma evacuation. (c) Vulvar hematoma post-hematoma evacuation. (d) Day 10 post-hematoma evacuation



Figure 2. Stool cell post-hematoma evacuation

Postoperative Management

The patient received postoperative care in collaboration with the paediatric team. Analgesics and antibiotics were administered as required. The patient's condition improved progressively over the three-day hospital stay, and she was discharged without complications. Follow-up visits were scheduled to monitor wound healing and rule out hematoma recurrence or infection.

Ethical Considerations

Informed consent was obtained from the patient's guardian for both treatment and publication of this case. Patient anonymity and confidentiality were maintained throughout the study in accordance with the Declaration of Helsinki and institutional ethical guidelines.

RESULT

Table 1. Characteristics of respondents

Parameter	Observation / Result
Patient	11-year-old female
Chief Complaint	Pain and swelling of the genital area following blunt trauma (fall in sitting position)
Duration Before Admission	12 hours after injury
Physical Findings	Right vulvar swelling ($7 \times 7 \times 5$ cm), bluish discolouration of the labia majora
Diagnosis	Non-obstetric vulvar hematoma
Hematoma Volume	Approximately 30 cc of clotted blood
Procedure Performed	Surgical evacuation via a 3 cm incision at the mucocutaneous border of the right labia majora
Suture Material	Vicryl 2-0 absorbable thread
Drain Placement	Installed intraoperatively, removed on postoperative day 2
Hospital Stay	3 days
Postoperative Course	Gradual improvement, no complications
Outcome	Complete recovery without recurrence or infection
Follow-up	Wound healed well; no hematoma recurrence on day 10 postoperative.

The presented case illustrates a rare instance of non-obstetric vulvar hematoma in a pediatric patient, managed successfully through surgical intervention. The patient exhibited the classical symptoms of pain and localized swelling, which progressively worsened within 12 hours post-injury. The large size of the hematoma ($7 \times 7 \times 5$ cm) and worsening symptoms necessitated prompt surgical evacuation rather than conservative management. Intraoperatively, a significant amount of clotted blood (approximately 30 cc) was evacuated, and a drain was installed to prevent reaccumulation. The use of absorbable Vicryl 2-0 sutures facilitated wound healing with minimal tissue irritation. Postoperatively, the patient's clinical condition improved progressively, with no signs of infection, necrosis, or hematoma recurrence. Early mobilisation and proper wound care contributed to a short hospital stay and a full recovery within 3 days. These findings align with existing literature suggesting that large or progressively expanding vulvar hematomas require surgical management to prevent complications such as infection, pressure necrosis, or hemodynamic instability. Conservative treatment is typically reserved for more minor, stable hematomas, whereas operative intervention ensures rapid symptom relief and better outcomes in extensive cases.

DISCUSSION

A hematoma is a collection of blood beneath the intact epidermis and appears as a fluctuant, soft lump. It can be excruciating to palpate. The vulva consists of loose connective tissue and smooth muscle, which receive their blood supply from branches of the pudendal artery, which originates from the internal iliac artery. Injury to the labial branch of the internal pudenda artery, located in the superficial fascia of the anterior and posterior pelvic triangles, can result in a significant vulvar hematoma (Lopez, Focseneanu and Merritt, 2018). Although venous bleeding is possible, arterial bleeding generally arises from a branch of the pudendal artery. Anatomically, there is no definitive explanation, but approximately 70% of all reported vulvar hematomas occur in the right labia (Lapresa Alcalde *et al.*, 2019).

During labor, a vulvar hematoma may result from direct or indirect injury to the soft tissues. Interestingly, most vulvar hematomas form after normal labor rather than labor with complications. Vulvar hematomas are more common in the obstetric population, with an incidence of 1:300 to 1:1000 deliveries. Severe non-obstetric vulvar hematomas are rare, and few cases have been reported in the literature. The incidence is approximately 3.7% and accounts for 0.8% of all gynecologic emergency cases (A Zejnullahu, A Zejnullahu and Kosumi, 2022).

These hematomas are more common in childhood or early adolescence because the labia majora, which are composed of fatty tissue for their protective function, are not fully developed in prepubertal girls. In adult women, the labia majora are composed of fatty tissue that protects abundant blood vessels and nerve endings from trauma (Ali, Xu and Lei, 2024). However, in children and adolescents, this protection is not optimal, so vulvar trauma is more common. Non-obstetric vulvar hematoma can result from various forms of perineal trauma, such as injury from a straddling fall, fall from a height, foreign body ingress, sexual assault, sexual intercourse, or surgery to the vulva (Swaminathan, Sharathkumar and Dowlut-McElroy, 2022). Blunt trauma to the vulva may occur secondary to reflex adduction of the thighs before trauma occurs. The anatomical position of the vulva and its rich vascular supply make it prone to hematoma formation when perineal injuries occur. In the case of a fall, the patient may experience pressure on the soft tissues of the vulva against the underlying pelvic bones, leading to lacerations and hematoma formation. If there is no trauma, another possible cause is spontaneous vascular rupture (Aghajani *et al.*, 2022).

Pain is the most common symptom of a vulvar hematoma. Patients may describe it as perineal pain, abdominal pain or buttock pain. Intermittent bleeding may also be present. Depending on the size and location of the vulvar hematoma, urologic or neurologic signs and symptoms may be present (Liang *et al.*, 2023). Due to mechanical obstruction of the urethra, patients may experience urinary retention or difficulty urinating. In severe cases, patients may experience hemodynamic instability and require fluid resuscitation or emergency blood transfusion. If a vulvar hematoma is suspected, a detailed history should be taken to determine possible causes, including previous history of sexual intercourse, accidents involving perineal injury, and recent history of childbirth or surgery. It is also important to carefully inquire about possible sexual assault (Oong and Eruo, 2025).

As bleeding into the vulva is mostly restricted by Colles' fascia and the urogenital diaphragm, hematomas in these areas will be visible on physical examination. The appearance may be a painful, fluctuating lump of varying size (Galante *et al.*, 2022). Because Colles' fascia provides little resistance, vulvar hematomas may reach 15 cm or more in diameter. Patients may report a lump or swelling in the groin area if asked during consultation (Hamilton *et al.*, 2021). Complete blood tests, blood typing and screening, and coagulation screening are performed when deemed necessary. If a blood transfusion is possible, a blood sample should also be taken for cross-matching. After the physical examination, perineal sonography is a useful tool in assessing the location and extension of the hematoma and can assist in expectative management through serial imaging at the bedside. Transperineal sonography is a useful non-invasive technique for follow-up and monitoring of patients undergoing expectative management of vulvar hematoma.

For cases suspected of retroperitoneal involvement, arteriovenous malformation, or aneurysm, CT-angiography is recommended as a more accurate imaging modality. Guerriero et al. recommend MRI for more detailed lesion mapping and exclusion of retroperitoneal involvement. MRI angiography of the pelvis may be helpful in detecting aneurysms.

There is no consensus on the management of non-obstetric vulvar hematomas. Most vulvar hematomas are small and can be managed conservatively. However, large hematomas (>10 cm in diameter) or those that continue to enlarge and cause severe pain and discomfort to the patient require surgical intervention. Emergency surgical management is also required if the hematoma is large enough to cause hemodynamic instability or if urological or neurological signs and symptoms develop. A catheter may be inserted if the patient has difficulty urinating. In this case, hematoma evacuation was performed, followed by drain placement, which was removed 2 days postoperatively (Maroun *et al.*, 2020).

Propst et al. observed that if there is no acute hematoma expansion, conservative management may yield good results. However, Benrubi et al. found that conservative management of hematomas was associated with a longer length of hospital stay, increased need for antibiotics and blood transfusions, and greater follow-up surgical interventions. Conservative management usually involves ice packs, local compression, bed rest, and analgesics. If conservative management is ineffective, surgery may be performed. In fact, conservative management of large hematomas is associated with more extended hospitalisation periods, increased need for antibiotics and blood transfusions. A conservative approach is also not recommended for acutely developing hematomas (Van Essen *et al.*, 2022).

Surgical management includes drainage of the hematoma, evacuation of blood clots, ligation of bleeding points, and assessment of signs of necrosis (complications of vulvar hematoma). Surgery can be performed under local anesthesia (Banasiewicz *et al.*, 2023). The incision should be made at the point of maximum edema, at the mucocutaneous border or through the vaginal mucosa. All blood clots should be removed to visualize the depth of the lesion, but without excessive manipulation of the traumatized area, if there is a bleeding point that needs to be stopped. In the majority of cases, the surface shows diffuse venous bleeding. Removal of the blood clot is important to reduce the risk of pressure necrosis and infection. If drainage is performed, a Penrose drain should be placed in the lowest area and removed 24 hours later. The intravaginal approach provides better cosmetic results (Altman *et al.*, 2020).

Alternatively, selective arterial embolisation can be performed. Arterial embolisation is then described as the last therapeutic option with good results (Silver *et al.*, 2024). It is performed after contrast CT to investigate and locate actively bleeding vessels, which are difficult to identify or suspected of having multiple foci. This procedure reduces hospitalisation duration compared with surgery (Björnsson *et al.*, 2020). However, due to the lack of technical platforms and high cost, this procedure cannot be performed in current practice and is not a primary option in resource-limited settings (Sounkere-Soro *et al.*, 2022).

Necrosis is a complication that requires surgical debridement. It arises from the pressure applied by a large or enlarged hematoma on the surrounding tissues. Pressure necrosis can be prevented by prompt surgical evacuation of the blood clot. As with any operatively treated condition, infection is a potential complication, and the patient should be followed up immediately after discharge from the hospital to check for hematoma recurrence or infection. Prophylactic antibiotics may be prescribed if clinically necessary. Early mobilization is beneficial in minimizing the risk of venous thromboembolism. However, there remains significant controversy regarding the recommended bed rest period before postoperative mobilisation. Other postoperative care relevant for patients undergoing vulvar surgery includes wound care, administration of postoperative analgesics, and antibiotics if required. In addition, as hematomas may recur after surgery, constant monitoring of the patient's vital signs is essential. The patient was treated by a paediatrician colleague for approximately 3 days, with progressive clinical improvement.

CONCLUSION

Non-obstetric vulvar hematoma is a rare but significant condition that may occur following blunt perineal trauma, especially in children and adolescents whose protective labial tissues are not fully developed. This case highlights the importance of prompt diagnosis and appropriate management to prevent complications such as necrosis, infection, or hematoma recurrence. Surgical evacuation, as performed in this case, proved to be an effective intervention for a large, progressively enlarging hematoma, leading to rapid symptom resolution and complete recovery within a short hospital stay.

Early clinical assessment and imaging are recommended to determine the extent of vulvar hematoma and guide appropriate management. Conservative treatment may be considered for small, non-progressive hematomas; however, surgical evacuation should be prioritized in cases presenting with severe pain, large hematoma size, or hemodynamic instability. Postoperative monitoring and follow-up are essential to ensure proper wound healing and to detect any recurrence or secondary infection. Education of healthcare providers on recognizing and managing pediatric vulvar trauma is also advised to optimize outcomes and prevent long-term complications.

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Conflict of Interest

There are no potential conflicts of interest relevant to this article.

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