

# Vulvar hemangiomas in an 11-year-old girl: Successful conservative management with low-dose propranolol

## Hemangiomas vulvares numa menina de 11 anos: tratamento conservador bem-sucedido com propranolol em baixa dose

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### Abstract

Infantile hemangiomas are common benign soft tissue tumors affecting the pediatric population. We present a case report of an 11-year-old girl with vulvar hemangioma accurately diagnosed and effectively managed using low-dose propranolol. The patient was treated with oral propranolol at 0.7 mg/kg/day for three months, with significant clinical improvement and near-complete lesion resolution. The patient showed an excellent response with minimal side effects, emphasizing the significance of thorough clinical evaluation and the success of pharmacological therapy in avoiding surgical or aesthetic interventions, particularly considering the hemangioma's location and the patient's age.

**Keywords:** Adolescence; Vulvar hemangioma; Benign soft tissue tumors.

### Resumo

Os hemangiomas infantis são tumores benignos comuns de partes moles que acometem a população pediátrica. Apresentamos o relato de caso de uma menina de 11 anos com hemangioma vulvar, diagnosticado e tratado de forma eficaz com propranolol em baixa dose. A paciente foi tratada com propranolol oral na dose de 0,7 mg/kg/dia por três meses, apresentando melhora clínica significativa e quase completa resolução da lesão. Observou-se excelente resposta ao tratamento, com efeitos colaterais mínimos, ressaltando a importância de uma avaliação clínica criteriosa e o sucesso da terapia farmacológica para evitar intervenções cirúrgicas ou estéticas, especialmente considerando a localização do hemangioma e a idade da paciente.

**Palavras-chave:** Adolescência; Hemangioma vulvar; Tumores benignos de partes moles.

### INTRODUCTION

Hemangiomas are proliferative lesions characterized by increased cell turnover, resulting from an imbalance in angiogenesis, which leads to peripheral vascularization. They can affect various parts of the body without a specific preference<sup>1</sup>. Most cases are diagnosed within the first months of life and following a self-limited course. Vulvar localization is uncommon

and represents a diagnostic and therapeutic challenge due to the sensitive anatomical site and potential functional and psychosocial implications, particularly in

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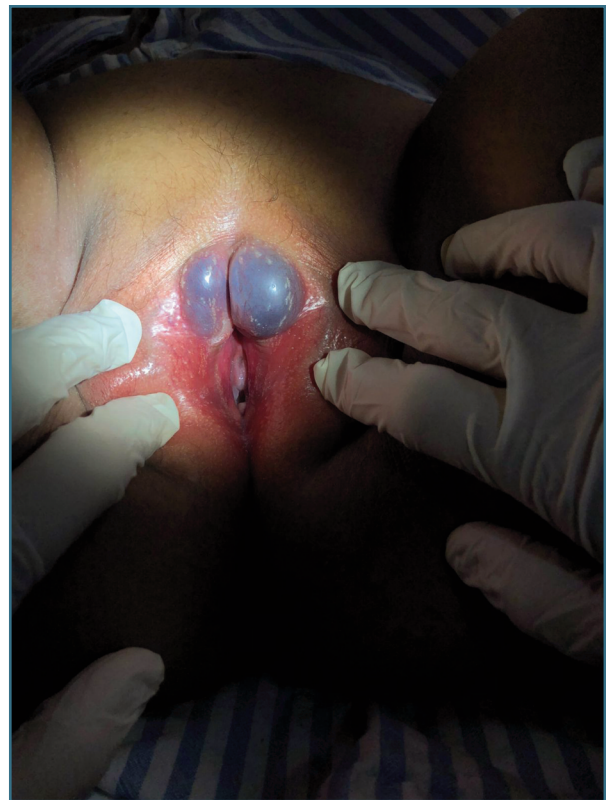
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pediatric patients<sup>2,3</sup>. The clinical presentation varies depending on the depth of the lesion. Edema and localized burning are common symptoms, although it can also be asymptomatic<sup>1</sup>. The estimated prevalence in the pediatric population is 4.5%, with the majority of hemangiomas located in the facial and cervical regions (60%) and rarely in the female genital tract<sup>2,3</sup>. However, reports of vulvar hemangiomas presenting or persisting during pubertal development are exceedingly rare, and the available literature is largely limited to infant populations<sup>1,4,5</sup>. As a result, evidence guiding management in adolescents is scarce, and therapeutic decisions are frequently extrapolated from infantile hemangioma protocols. Data on conservative, non-surgical treatment approaches in this specific context remain limited, despite the importance of avoiding surgical morbidity during genital maturation<sup>3,6</sup>. In this setting, the present case addresses an important clinical and scientific gap by describing the use of low-dose oral propranolol as a conservative therapeutic option in a pubertal patient with vulvar hemangiomas.

## CASE REPORT

An 11-year-old girl presents to the pediatric and adolescent gynecology outpatient clinic with a complaint of a vulvar lesion. According to her mother, the lesion appeared two years ago, when the patient was nine years old, and has progressively enlarged since then. The patient reports occasional edema in the lesion, particularly when the area is touched, but denies pruritus, discharge, pain, or any other associated symptoms. She has no other comorbidities or ongoing medication use. The patient presented no gastrointestinal or pelvic bulk symptoms and had no history of blunt genital trauma. Physical examination was complete and included assessment of compressibility, which did not suggest other vascular malformations.

The patient's weight is 63.0 kg, and her height is 145 cm. Her pubertal milestones include telarche at 10 years old and pubarche at 11 years old, with menarche still not occurring. The mother's prenatal course was uneventful, and she delivered the patient vaginally after induction for post-term pregnancy at 42 weeks, with a birth weight of 3360 g. The mother was 21 years



**FIGURE 1.** Vulvar hemangioma in a 11-year-old girl. Baseline clinical presentation: bilateral vulvar hemangiomas observed at initial evaluation in an 11-year-old girl prior to treatment initiation, measuring approximately 2.5 × 1.0 cm on the right side and 3.0 × 2.0 cm on the left side.

old at the time of her first and only pregnancy and is a non-smoker.

The patient was at Tanner stage B3P2, and vulvar inspection revealed a normal-sized clitoris and an estrogenized vulva. Two lesions suggestive of hemangiomas were observed at the transition between the mons pubis and the labia majora, bilaterally, parallel to the clitoris. Imaging studies were not performed, as the lesions showed typical clinical features of hemangiomas on physical examination, without signs suggestive of alternative vascular malformations, and the decision was made to avoid unnecessary diagnostic procedures in a pediatric patient. The lesions measured approximately 2.5 cm × 1.0 cm on the right and 3.0 cm × 2.0 cm on the left (Figure 1).

Oral propranolol therapy was initiated at a fixed dose of 0.7 mg/kg/day, selected as a low-dose conservative



**FIGURE 2.** Clinical evolution during treatment with oral propranolol. (A) Partial response after three months of treatment with low-dose oral propranolol (0.7 mg/kg/day), showing complete resolution of the right-sided lesion and an estimated 60-70% reduction of the left-sided hemangioma. (B) Near-complete remission of the left-sided hemangioma with sustained complete resolution of the right lesion at the end of the three-month treatment course.

regimen appropriate for the patient's body weight (63.0 kg), corresponding to approximately 0.7 mg/kg/day. Prior to treatment initiation, a baseline clinical assessment was performed, including evaluation of heart rate, blood pressure, and glycemia, with no contraindications identified. Given the low initial dose and normal baseline findings, dose titration was not considered necessary. The patient was monitored through scheduled outpatient follow-up visits at 1 and 3 months, with clinical evaluation focused on treatment response and potential adverse effects.

At baseline, the patient presented with two bilateral vulvar hemangiomas measuring approximately 2.5 × 1.0 cm on the right side and 3.0 × 2.0 cm on the left side (Figure 1). After initiation of oral propranolol therapy, clinical follow-up was performed at 1 month, when both the patient and her mother reported subjective improvement, with decreased lesion volume and reduced discomfort on palpation. At the 3-month follow-up, physical examination demonstrated com-

plete resolution of the right-sided lesion and an estimated reduction of approximately 60-70% in the size of the left-sided hemangioma (Figure 2A). Subsequent assessment after completion of three months of continuous treatment confirmed sustained complete resolution of the right lesion and near-complete remission of the left lesion (Figure 2B).

Follow-up was conducted at the outpatient clinic after a prolonged 3-month treatment course with propranolol at a daily dose of 0.7 mg/kg/day. The assessment during this visit revealed complete resolution of the right-sided hemangioma and remission of the left-sided hemangioma (Figure 2B). Based on the favorable clinical response observed, the decision was made to maintain the current dose of 0.7 mg/kg/day.

## DISCUSSION

Infantile hemangiomas are common benign soft tissue

tumors that primarily occur in childhood, affecting approximately 1-2% of neonates and 10-12% of children during the first year of life<sup>5</sup>. While most hemangiomas follow a self-limiting course, certain atypical presentations can present diagnostic and therapeutic challenges<sup>1,4</sup>. The main factors contributing to hemangiomas include premature birth, low birth weight, female sex, Caucasian race, maternal smoking, advanced maternal age, and multiple pregnancies. In recent decades, there has been a notable increase in the incidence of infantile hemangiomas, possibly linked to the higher prevalence of low birth weight<sup>1</sup>.

Most published reports of vulvar hemangiomas describe cases diagnosed in infancy or early childhood, with management strategies frequently involving surgical excision due to lesion size, symptoms, or diagnostic uncertainty<sup>2,3,6</sup>. Reports involving adolescents are rare, and available data in this age group remain limited to isolated case descriptions or small series, often lacking standardized therapeutic approaches<sup>5,6</sup>. Compared with previously reported cases, the present patient demonstrated a favorable response to low-dose oral propranolol, supporting the feasibility of conservative management even beyond infancy, particularly when lesions are clinically stable and located in anatomically sensitive regions.

We present the case of an 11-year-old girl with vulvar hemangiomas that developed during her pubertal growth, in the absence of any known risk factors reported in the literature. Prompt diagnosis of these lesions is crucial due to their potential to cause functional impairment and emotional distress<sup>4</sup>. Physical examination plays a pivotal role in establishing an accurate clinical diagnosis, while the examiner's experience is essential for characterizing the hemangioma and initiating appropriate treatment<sup>7</sup>.

Pubertal development is characterized by dynamic hormonal changes that may influence vascular proliferation and lesion behavior. Although the exact role of sex hormones in the progression or persistence of hemangiomas during adolescence remains unclear, estrogen-related effects on vascular endothelial growth have been hypothesized as potential modulators of lesion activity<sup>4,7</sup>. In the present case, lesion progression during early pubertal stages raises the possi-

bility that hormonal factors may have contributed to clinical expression, while the favorable response to beta-blocker therapy suggests that propranolol remains effective despite this distinct physiological context.

In this case, gastrointestinal and pelvic bulk symptoms, as well as any history of blunt trauma to the genital area, were excluded during the clinical evaluation. The physical examination was comprehensive and included the assessment of compressibility of the lesion, an important feature in the differential diagnosis between hemangiomas and other vascular malformations such as arteriovenous or lymphatic malformations<sup>6,7</sup>. The absence of these findings reinforces the consistency of the clinical diagnosis of hemangioma and supports the therapeutic decision made, which led to a satisfactory clinical response and symptom resolution.

Beta-blockers, particularly oral propranolol, have emerged as the treatment of choice for vulvar hemangiomas due to their favorable clinical outcomes and low incidence of severe adverse effects<sup>6</sup>. Monitoring patients on propranolol therapy is essential, particularly in younger children, to manage the potential risks of hypotension and hypoglycemia<sup>8</sup>. Although atenolol and nadolol demonstrate comparable efficacy with fewer side effects and more favorable dosing schedules, further investigation is needed<sup>9,10</sup>.

Classic infantile hemangiomas typically present within the first months of life, followed by a proliferative phase and subsequent spontaneous involution<sup>1,4</sup>. In contrast, hemangiomas presenting or becoming clinically relevant during adolescence may represent late-presenting, persistent, or atypical variants, posing diagnostic and therapeutic challenges<sup>6,7</sup>. Recognizing these distinctions is essential, as management strategies derived from infant populations may not always be directly applicable. This case highlights the importance of individualized assessment and cautious extrapolation of treatment protocols when managing vulvar hemangiomas in pubertal patients.

Topical beta-blockers, such as propranolol and carteolol, have been explored as treatment options, although evidence supporting their efficacy is limited<sup>11</sup>. Systemic corticosteroids were once the mainstay for

treating infantile hemangiomas; however, propranolol has supplanted them due to its superior effectiveness. Systemic corticosteroids may still be considered if propranolol is contraindicated or fails to produce a sufficient response. Topical corticosteroids have shown potential but remain underexplored in the treatment of infantile hemangiomas<sup>8,12</sup>.

Laser therapy, specifically Nd-YAG 2940 nm or ablative carbon dioxide lasers, is commonly used for hemangiomas that are already in regression<sup>13</sup>. The combination of laser therapy with systemic or topical beta-blockers has shown enhanced efficacy compared to monotherapy. However, the existing evidence on the use of early laser treatment to halt hemangioma growth or treat ulcerated hemangiomas is limited and heterogeneous<sup>12-14</sup>.

In cases of symptomatic vulvar hemangiomas, surgical resection is frequently reported in the literature; however, its technical complexity and the potential for functional and anatomical distortions warrant careful consideration<sup>3,15</sup>. Notably, large and deep lesions may require collaboration with a vascular surgeon to achieve optimal outcomes<sup>15</sup>.

We report the case of an 11-year-old girl with vulvar hemangioma, accurately diagnosed and successfully managed with low-dose propranolol. The patient showed an excellent response to treatment with minimal side effects.

This case supports the feasibility of conservative management with low-dose oral propranolol for vulvar hemangiomas in a pubertal patient, rather than establishing treatment effectiveness, and highlights the importance of individualized clinical decision-making in this context. Given the hemangioma's location and the patient's age, a non-invasive approach was essential. The main limitation of this case is the absence of imaging studies, as Doppler ultrasound or MRI could have provided greater diagnostic certainty and more detailed anatomical characterization. This limitation may reduce diagnostic robustness and limit the external applicability of the findings; however, the decision to forego imaging reflected a conservative, clinically driven approach aimed at avoiding unnecessary procedures in a pediatric patient.

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Written informed consent for publication was obtained from the patient and her parents.

#### **DISCLOSURE/CONFLICT OF INTEREST**

The authors declare no conflict of interests.

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