

Anatomical Description and Proposed Classification of Vulvoperineal Pterygium (VPP): a Previously Undescribed Anatomical Variant of Vulvar fork Conformation

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ABSTRACT

Background: Anatomical variations of the vulvoperineal region are under-recognized in standard gynecological literature despite their potential impact on sexual function and quality of life. In clinical practice, we repeatedly observed a membranous epithelial structure spanning the posterior fourchette, associated with introital narrowing, dyspareunia, and fissuring, which, to our knowledge has not been previously described.

Objective: To provide a detailed anatomical description, propose standardized nomenclature, and introduce a morphological classification for a previously undescribed anatomical variant—the Vulvoperineal Pterygium (VPP).

Methods: A descriptive, multicentre observational study was conducted between April 2023 and December 2024 in three centers in Spain and Argentina. Women aged ≥ 16 years attending routine gynecological consultation were included. Standardized documentation of VPP morphology and symptoms was performed. In cases with clinical fibrosis, a complete resective biopsy was performed for histopathological analysis. We propose a surgical technique for outpatient resective biopsy. A literature search found no prior descriptions of VPP.

Results: Among 2,171 women (17–84 years), 201 presented with VPP (9.3%). Of these, 120 (59.7%) underwent complete resective biopsy. Symptoms included dyspareunia (61.7%) and recurrent fissuring (44.1%). Associated conditions were vulvovaginal atrophy (44%) and history of lichen sclerosus (29%). Histology revealed stratified squamous epithelium with irregular basement membrane, fibrosis, vascular changes, and chronic inflammatory infiltrates.

Conclusions: VPP represents a previously unrecognized anatomical variant that may contribute to mechanical dyspareunia and recurrent fourchette fissures. Its identification and classification may enhance diagnostic accuracy and guide management. Histopathological findings suggest a potential relationship with early lichen sclerosus, warranting further research.

Keywords

Vulvoperineal pterygium, Posterior fourchette, Vulvar anatomy, Dyspareunia, Lichen sclerosus, classification.

Introduction

In the usual gynecology consultation, we have seen many patients, especially in the peri- and post-menopausal period, who referred to us symptoms of dyspareunia and post-coital pain and irritation coinciding in the examination with the presence of a raised vulvar fork tissue extending from side to side in the posterior vertex of the introitus, with a fibrotic and tense appearance, making a

clear separation between the vagina and perineum (Figures 1,2,3). This anatomical zonal conformation generally showed us, upon symptomatic consultation, scars and lesions due to fissures in it as causes of pain (Figures 4,5). This repetition of similar cases led us to do an extensive analysis in many patients of the normal anatomical conformation of the area and to redescribe it with the variable of this integumentary annex to which we decided to give a name and analyze its treatment variables due to its clear relationship with sexual dysfunction [3-6]. An extensive anatomical analysis that we then began to do in symptomatic patients led us to this description and naming of this structure that is not described in



Figures 1-3: Pterygion.



Figure 4: Medial fissure.



Figure 5: Fissures Pterygium and navicular fossa.



Figure 6: Pterygium in a minor girl.



Figure 7: Pterygium in a teenager.

normal anatomy books or in pathological anatomy books to date, studying its nature, and of course evaluating its specific treatment variables, understanding that age is not a criterion for decision making since we saw this structure in many very young women, even in childhood and adolescence (Figures 6,7) [7].

Our primary objective here is to describe this anatomical condition and give it a name because it is not reported in the bibliography to date, being only mentioned sporadically as “introital stricture or stenosis”, “fourchette”, etc.

The secondary objective is to identify diagnostic and therapeutic variables that allow predicting the long-term evolution of the vulvar lesion, as well as evaluating the association between this pathology and other dermatological diseases such as atopic or spongiotic dermatitis and lichen sclerosus.

The therapeutic approach to this pathology has evolved towards a more comprehensive perspective, combining precise surgical techniques with regenerative therapies. Complete resection of the pathological tissue, followed by anatomical reconstruction of the vulvar fork, and finally addition of advanced techniques such as the use of platelet- rich plasma, infiltrations with hyaluronic acid and stimulation and/or ablation with CO2 laser have proven to be effective strategies to achieve a complete and lasting resolution of the lesion [8-12].

Methods

Literature search

In April 2023, a literature search was conducted in PubMed, Scopus, Web of Science, and Cochrane Library. Google Scholar was also consulted to identify gray literature. Primary search terms included: “vulvar anatomy”, “perineum”, “posterior fork” and

“vulvar anatomical variants”. The standard anatomical reference (Netter's atlas of human anatomy) was also reviewed. No previous descriptions of Vulvoperineal Pterygium (VPP) were identified.

Study design

A descriptive, multicenter observational study was conducted at three institutions: Clínica Sagrada Familia (Barcelona, Spain), Clínica Palacios (Madrid, Spain), and Centro LH&B (Buenos Aires, Argentina), from April 2023 to December 2024. Data were collected from consecutive patients prospectively during routine gynecological consultations and documented in a standardized manner.

Inclusion criteria

- Women ≥ 16 years old who attend a gynecological consultation.
- Presence of a transverse epithelial membrane in the posterior fork.

Exclusion criteria

- Major congenital malformations of the vulva.
- Recent traumatic injuries.

Procedure

Each participant underwent a detailed gynecological examination. The parameters recorded included: age, parity; presence of membrane in the posterior fork and degree/anatomical status of PPV according to the classification devised (Table 1). Associated symptoms (dyspareunia, fissures, irritation) were systematically recorded. In selected cases, where fibrosis was identified ($n = 120$), a complete resection biopsy (CRB) was performed under local anesthesia followed by serial histopathological sections for analysis.

Discussion

Description – Study sample - Name

We describe in detail in this presentation an epithelium that grows as a fleshy perineum in the vulvar fork, from side to side, partially occupying the vulvar navicular fossa and anterior limit of the perineal area, with the formation of a membrane with a wing-shaped structure, as a sheet of tissue similar to that of the vulvar skin with which it is continuous, generally not completely flexible, but resistant to traction (Figure 2).

Its etiology is not established and is unknown; in many cases it may be congenital, although possibly caused by an inflammatory process, in most cases aseptic. Its histology demonstrates the inflammatory factor that accompanies the entity. It is frequently associated with moderate-severe vulvo-vaginal atrophy and especially with Lichen Sclerosus as we already mentioned. For all this, the autoimmune nature seems highly probable.

We evaluated a total of 2171 women, aged between 17-84 years and in that group 201 had this tissue of the introitus (prevalence 9.3). Average age 46 +/- 4.8 years). The mean parity was 1.9 (range 0-4). Of these women, 120 (59.7%) received complete tissue resection biopsy (CRBP). The most reported symptom was dyspareunia (61.7%) and recurrent fissures (44.1%). Associated SGU (44%) and final diagnosis of LEA in 44% of biopsied patients (Table 1).

A complete review has been carried out in human anatomy texts, other morphological sciences, clinical specialties and Internet publications, and this flap that concerns us today has not been described. We decided to call it "pterygium" because of its winged shape and in honor of classic Greek medicine. We finally gave it the name Vulvar Vaginal Pterygium (VVP) to differentiate it from the entity so called and described in the ocular conjunctiva and from the Pterygium Colli of Turner Syndrome [13-15].

Histopathological description

We see Pterygium as a kind of "invasion" and growth of tissue from the superficial and lower edge of the vaginal introitus. The epithelium that corresponds to the vulvar fork and navicular fossa advances and grows from the outside to the center, forming a membrane of epithelial tissue, with cells and blood vessels from the adjacent skin that are placed in front of the vaginal introitus, in its lower part, decreasing the vaginal introitus. The usual thing is that it is a kind of "wedge" or triangle (wing) with the apex pointing towards the perineum. In the examination, when pulling on the sides, the membrane can be seen in tension, which can often cause pain and the appearance of fissures (Figures 4,5). This membrane fissures due to the distention produced during the penetration of sexual intercourse, producing the reported pain. There is no record of this pathology, if it is considered as such, in any treatise on gynecology and of course less on its possible treatment.

The existence of a membrane in the perineal region that interferes with normal sexual function indicates an anatomical malformation that must be exhaustively evaluated to determine its origin, extension and possible associated complications, requiring a specific therapeutic approach.

From a histological point of view, it is a "septum" formed by stratified squamous epithelium that is more or less keratinized depending on the number of inflammatory episodes that have occurred, with an irregular basement membrane with areas detached from the underlying lamina propria, which appears very vascular and made up of normal collagenous areas and others with fibrotic changes and chronic inflammatory infiltrate. We have found in the aforementioned lamina propria, in the more than 100 histological studies that we carried out, extensive sclerotic areas and other dispersed ones that led us to study the relationship of this entity with lichen sclerosus, which will be the subject of another publication (Figures 8,9).

Table 1: Demographic and Clinical findings in women with VVP.

Variable	Value / Percentage
Total women examined	2,171
Women with VPP	201 (9.3%)
Mean parity	1.9 (0–4)
Symptoms among VPP cases	
- Dyspareunia	124/201 (61.7%)
- Recurrent fissuring	89/201 (44.1%)
Associated conditions	
- Vulvovaginal atrophy	88/201 (44%)
- History of lichen sclerosus	58/201 (29%)
Complete resection (CRB)	120/201 (59.7%)
Key histological features*	Fibrosis (78%), chronic inflammation (78%), variable keratinization [2]

*Based on the analysis of 120 participants

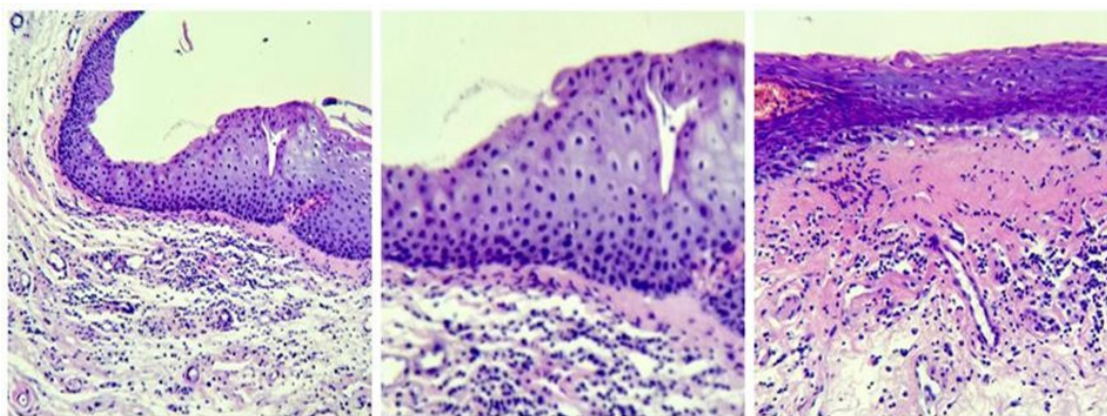


Figure 8: AP visualization of Pterygium in parallel sections where the different conformation that the lamina propria presents in terms of its fibrosis and etiopathogenic nature is seen. In this case it was an LEA in three different evolutionary stages.

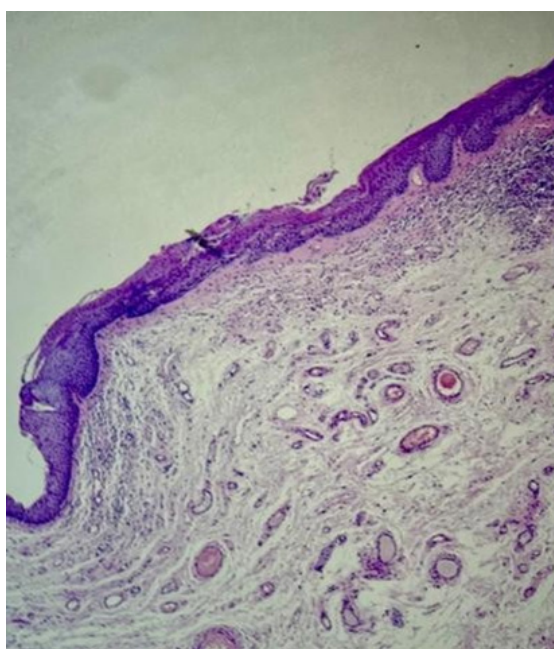


Figure 9: Pterygium in cut area that shows lamina propria with slight fibrotic changes but characteristics in the basal layer typical of the so-called Early Lichen.

Classification

We have developed a classification system for pterygium based on morphometric and histological characteristics. The classification considers the size of the lesion, measured by its height and elevation, as well as the presence or absence of fibrotic tissue. This system allows an objective evaluation of the severity of the pathology and guides the choice of the most appropriate treatment.

We then allow ourselves to classify the Pterygium into four grades and two states (Table 2). Taking into account the extent of the elevation, up to 5 mm Grade I Pterygium (Figures 10,11,12,13); between 5 and 10 mm Grade II (Figures 14,15,16,17) and greater than 10 mm Grade III (Figures 18,19,20).

Table 2: Proposed Classification of the Vulvoperineal Pterygium (VVP).

Grade	Morphological description	State (Elastic)	A	State (Fibrotic)	B	Suggested management
0	Fourchette fibrosis without a fully formed VPP or rudimentary membrane	-		Present		Complete resection (CRB)
I	Height ≤5 mm	Hydrated, non-fibrotic		Fibrosis ≤5 mm		Hyaluronic acid (HA) / CRB
II	Height 5–10 mm	Hydrated, non-fibrotic		Fibrosis 5–10 mm		HA / CRB
III	Height >10 mm	Hydrated, non-fibrotic		Fibrosis >10 mm		CRB

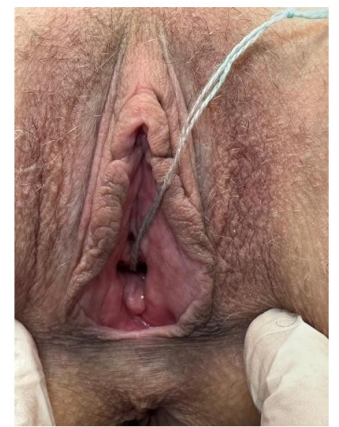
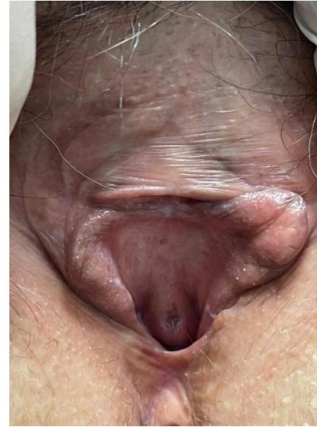
Analyzing the tissue damage, we divide each Grade into A: non-scarring (fleshy appearance) and B: scarring (rigid appearance). Finally, and based on the advances in diagnosis that we had with the biopsies performed, we decided to incorporate a new group: Grade 0 where we see hairpin fibrosis without Pterygium or with an outline of it, but with the appearance of fissures when doing countertraction in the area (Figures 21,22). They always have, regardless of the grade and state, a characteristic conformation: being on the horizontal perineal axis.



Figures 10-11: Grade IA: Less than 5 mm in height and fleshy, non-fibrotic appearance.



Figures 12-13: Grade IB Less than 5 mm in height and fibrotic appearance



Figures 18-19: Grade IIIA More than 10 mm fleshy appearance.



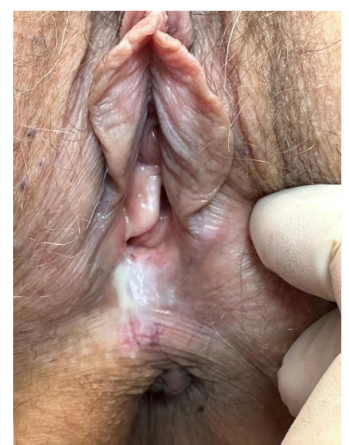
Figures 14-15: Grade IIA 5 to 10 mm and fleshy non-fibrotic appearance.



Figures 20: Type IIIB More than 10 mm fibrous appearance.



Figures 16-17: Grade IIB 5 to 10 mm and fibrotic appearance



Figures 21-22: Type 0. Fork scar fibrosis without Pterygium or with an outline of it but with fissures when doing countertraction

The importance of our classification lies in the fact that we were able to demonstrate with so many cases treated that those who have scarring changes (States B), regardless of the Grade, must all be taken to a complete resection biopsy (CRB) and reconstruction of the fork in the bed that remains after the resection of the pterygium because these cases have a very high relationship with a diagnosis of Lichen Sclerosus and also because they do not respond to minimally invasive therapies such as infiltration with HA or fractionated laser. We suggest the same therapeutic decision for Grade 0 Pterygium.

We cannot analyze the real global prevalence beyond what our sample demonstrated because it is a little-known entity and therefore underdiagnosed, but it has no direct and/or unique relationship with age or menopausal status. It can appear congenitally in childhood (Figure 6) and be seen in adolescence (Figure 7), postpartum, after recurrent vaginal infections and of course in the menopausal period. Visualization is common in moderate-severe vulvo-vaginal atrophy and especially when Lichen Sclerosus occurs.

Exploration

In the area of the perineal that corresponds to the vulvar fork and navicular fossa, in the gynecological position, we can observe in direct visualization a slight elevation of tissue as an epithelial membrane that is placed in front of the vaginal introitus, in its lower part, being able to reduce the introitus. However, the best way to look for it and see it is by slightly pulling on the sides of the vulva to increase its opening (Figures 8,9), there you can see the Pterygium in tension, often causing pain and even bleeding upon examination.

Symptoms

It is usually asymptomatic, but when sexual intercourse occurs, dyspareunia can appear very frequently when traction occurs in the tissue due to the increase in the rigidity of the fork and due to repeated friction on the Pterygium. After sexual intercourse, there are usually small erosions and/or direct tears in the epithelium of the pterygium that usually take time to heal, causing burning and/or pain in subsequent days [16].

Proposed Treatment

Various therapeutic strategies have been proposed over time for lesions in this tissue, always empirically, without being described and cited in the medical literature and always at the individual intuitive discretion of each medical professional. Among the strategies mentioned, we highlight the application of cream therapies with estrogens and/or vulvar moisturizers.

After much study in the area with our work group, we concluded that "chronic symptomatic pterygium" requires surgical resective therapy in the majority of cases that do not respond to local therapies with hormones, moisturizers or steroids.

We have designed and here present a technique for complete resection and functional reconstruction of the vulvar fork: Complete Resective Pterygium Biopsy (CRPB). This technique allows a precise and complete resection of the pathological

tissue and a meticulous reconstruction of the perineal anatomy, restoring sexual function and improving the quality of life of patients. Preliminary results suggest a lower rate of postoperative complications and greater patient satisfaction compared to conventional biopsy techniques. After applying local infiltrative anesthesia with 1% lidocaine, we performed a complete losange resection of the tissue from side to side (Figure 23) and to the depth, identifying the perineal fascia as the limit of resection and then we reconstructed the fork with transverse suture in two planes with separate absorbable stitches, first detaching the perineal vaginofascia by 2 cm to leave the final suture without tension (Figure 24) by lowering the mucosal tissue from the Posterior vaginal introitus for final closure of the reconstruction of the area.

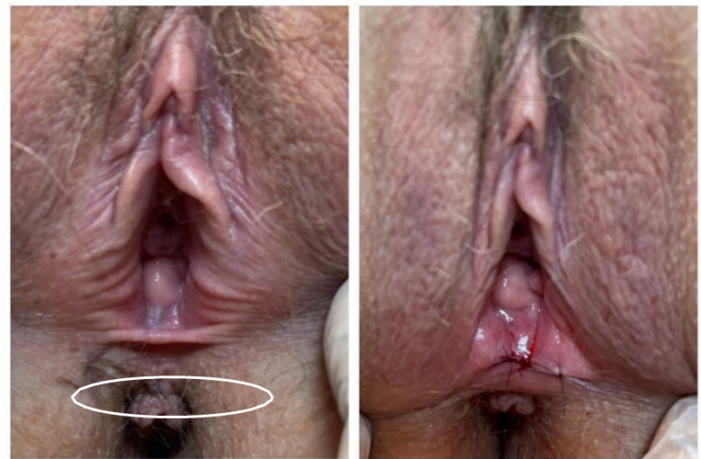


Figure 23: Resección losángica del Pterigion y **Figure 24:** Sutura transversal descendiendo vagina.

In recent years, new strategies for vulvo-vaginal pathology have appeared based on the rise of regenerative medicine and gynecology, such as: the infiltration of platelet growth factors (PRP); Stem cells from fatty tissue (Nanofat and SVF); Cross-linked and/or non-cross-linked hyaluronic acid; use of Exosomes or Peptide concentrates, carboxytherapy and CO2 laser techniques for tissue stimulation (fractional) or ablation [17-21]. The results obtained with these techniques were not satisfactory in a high percentage of patients who presented recurrences with reappearance of Pterygium and its complications, so our focus today is to give Surgery with our functional anatomical- specific resective biopsy technique (CRPB) a specific place to confirm diagnosis and solve the functional issue in a single treatment session.

This resection also allows the delivery of all the tissue to the pathologist who will be able to process the piece in detail to be able to make the best study and differential diagnosis of the pathological tissue variables of the area. With this detailed and extensive pathological analysis of tissue, we have received a diagnosis of early stage lichen sclerosus (Early Lichen) in more than 90% of the cases studied.

Additionally, we use post-surgical resection infiltration of the area with a regenerative technique that combines platelet-rich plasma

(PRP) and 2% non-cross-linked hyaluronic acid. This combination has proven to be effective in accelerating the healing process and improving the quality of the neoformed tissue in the vulvar fork.

Conclusions

1. The name "vulvo-perineal vaginal pterygium" (VVP) is proposed to describe a common pathological anatomical condition in the vulvar region that, to date, does not have a specific nomenclature in the medical literature. This new name seeks to unify knowledge about this clinical entity, facilitate communication between health professionals and improve care for affected patients.
2. We design and propose biopsy with complete resection (BRCP) as the treatment of choice for vulvar pterygium, especially in symptomatic and/or suspected cases of lichen sclerosis. This surgical technique allows the complete removal of the lesion and confirms the early histopathological diagnosis, frequently associated with this anatomical formation, in addition to the functional reconstruction of the vulvar fork, significantly improving the quality of life of the patients.

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