DOI: 10.7860/JCDR/2023/60277.17575

Original Article

Pathology Section

Clinicopathological Spectrum of Vulvar Lesions- A Retrospective Study

SESHA DEEPTHI PRATTI[1], PRATTI LOHI S RAJLAXMI[2], YADAVALLI RD RAJAN[3]

ABSTRACT

Introduction: Vulvar lesions constitute a wide spectrum ranging from non neoplastic inflammatory lesions to malignancies. Some show nodular masses and others remain asymptomatic. This poses challenges to clinicians in differentiating non neoplastic inflammatory dermatoses from benign and malignant lesions. Along with the clinical history and physical examination, a biopsy of the lesion plays an important role in proper diagnosis and treatment.

Aim: The aim of the present study was to identify the morphological spectrum of vulvar lesions with clinical and histological findings.

Materials and Methods: This was a retrospective observational study conducted in the Konaseema region of India for two years from January 2019 to January 2021. A total of 85 female patients with vulvar lesions were included in the study. Biopsy samples were obtained from all the 85 cases and were formalin-fixed, routinely processed, and paraffin embedded. Haematoxylin and Eosin (H&E) staining was done. Special stains were done wherever necessary. The results were analysed using Microsoft excel.

Results: The age of patients ranged from 18-88 years. The most common age of patients was in the 4th decade (30 cases amounting for 35.29%). The mean age of the study population was 39.5±15 years. Among the 82 cases, 40 (48.78%) were non neoplastic lesions, and 42 (51.21%) were neoplastic lesions. Among the neoplastic category, 27 (64.2%) were benign lesions and 15 (35.71%) were malignant lesions. The non neoplastic category included five infections (12.5%) and 35 non infectious inflammatory lesions (87.5%). The infections included one case of MC and 4 cases of condyloma acuminatum. The non infectious, and non neoplastic inflammatory lesions included 10 cases of Lichen Sclerosus Atrophicus (LSA), one case of Lipomatoushamartoma, four cases of Lichen planus, six cases of epidermal cysts, 10 cases of Bartholin cysts and four cases of Gartner duct cyst. The benign lesions in the neoplastic category included four cases of Hidradenomapapilliferum, four cases of Aggressive Angiomyxoma (AA), 12 cases of Fibroepithelial Stromal Polyps (FEP), and a case of Leiomyoma. The malignant lesions included 14 cases of squamous cell carcinoma and a case of extramammary Paget's disease.

Conclusion: Vulvar lesions can be due to eclectic causes and pose a diagnostic difficulty both clinically and histopathologically due to their similar presentation. Thorough clinical and pathological examination along with proper clinicopathological correlation is required for accurate diagnosis and treatment.

Keywords: Haematoxylin and eosin, Vulvar lichen sclerosus, Vulvar neoplasms

INTRODUCTION

Vulvar lesions constitute a wide spectrum ranging from non neoplastic inflammatory lesions to malignancies. This varied presentation is attributed to the epithelial linings of the vulvar region derived from all three layers i.e., ectoderm, endoderm, and mesoderm along with their hormonal and immune responses [1]. The aetiology of vulvar lesions ranges from infective, inflammatory conditions to benign and malignant neoplasms. These could be due to sexually transmitted infections or due to sporadic or genetically-linked neoplasms. The most common presentation of the vulvar lesions is pruritis. Some show nodular masses and others remain asymptomatic. Most of the infectious lesions can be treated medically.

Benign lesions usually require excision whereas, the malignant lesions do not have a good prognosis. This poses challenges to clinicians in differentiating non neoplastic inflammatory dermatoses from benign and malignant lesions [2]. Squamous cell carcinoma of the vulva constitutes 4% of the gynaecological malignancies with a preceding Vulvar Intraepithelial Neoplasia (VIN), which starts as a patch and that needs to be differentiated from other inflammatory and benign lesions [3]. Early diagnosis of the lesion prevents radical surgery and reduces mortality and morbidity. The aim of the present study was to identify and study the morphological spectrum of vulvar lesions with clinical and histological findings.

MATERIALS AND METHODS

This is a retrospective observational study that includes the clinical presentation and histopathological evaluation of biopsy samples received from 85 patients presenting with vulvar lesions in Konaseema region. The duration of the study was two years, from January 2019 to January 2021 at SS Hospital, Amalapuram.

Inclusion criteria: All the patients above the age of 18 years, presenting with vulvar lesions were included in the study.

Exclusion criteria: Patients presenting with pre-existing malignancies were excluded.

The patient's clinical history including age, chief complaints, and physical examination findings was noted.

Study Procedure

All the biopsy samples were formalin-fixed, routinely processed, and paraffin-embedded. H&E staining was done. Histopathological diagnoses were made and compared clinically. Informed consent was taken from the patients for the clinical photographs. The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation and adheres to the declaration of Helsinki.

STATISTICAL ANALYSIS

The data was analysed using Microsoft excel 2019. Categorical data was represented in the form of frequencies. Continuous data were represented as mean.

RESULTS

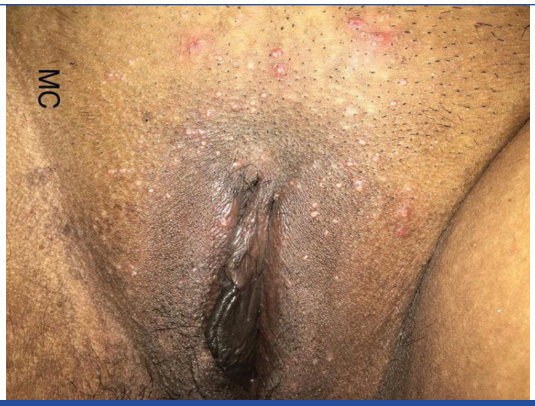
A total of 85 cases of vulvar lesions were included in the present study. The age of patients ranged from 18-88 years. The most common age of patients was in the 4th decade (30 cases amounting for 35.29%). The mean age of the study population was 39.5±15 years. The common presenting complaints included itching, patches, hypopigmented lesions, nodular and warty masses and ulcers. Labia majora was the most common site involved. Among the 85 cases, 3 cases were not willing to get a biopsy done. Among the 82 cases, 40 (48.78%) were non neoplastic lesions, and 42 (51.22%) were neoplastic lesions. Among the neoplastic category, 27 (64.2%) were benign lesions and 15 (35.71%) were malignant lesions. The non neoplastic category included 5 infections (12.5%) and 35 non infectious inflammatory lesions (87.5%). [Table/Fig-1]. The infections included one case of MC presenting as umbilicated pearly white lesions over the vulva, it being a clinical diagnosis, a biopsy was taken to rule out any malignancy. The clinical image of a patient with MC is shown in the [Table/Fig-2]. The other infections included four cases of Condyloma Acuminatum which presented clinically as a warty polypoidal lesions of varied sizes, of which one patient was a 35-year-old female who is Human Immunodeficiency Virus (HIV) positive [Table/Fig-3].

The non infectious, and non neoplastic inflammatory lesions included 10 cases of Lichen Sclerosus et Atrophicus (LSA). This was most commonly seen in perimenopausal and postmenopausal women with hypopigmented patchy lesions of vulva associated with marked pruritis. One case of Lipomatous hamartoma with a size of 7×5×4 cm in a 55-year-old female excised from labia majora was diagnosed. Four cases of Lichen planus in a 88-year-old patient, six cases of epidermal cysts, 10 cases of Bartholin cysts and four cases of Gartner duct cyst were included in the non infectious non neoplastic inflammatory lesion category.

The benign lesions in the neoplastic category included four cases of AA [Table/Fig-4], 12 cases of FEP and a case of leiomyoma [Table/Fig-5], four cases of Hidradenoma Papilliferum (HP) [Table/Fig-6] presenting as a nodular lesion of 1.5×1 cm, and six cases of lobular capillary haemangioma {Pyogenic Granuloma (PG)}. The malignant lesions included 14 cases of squamous cell carcinoma and a case of extramammary Pagets disease. The least age of patients in the malignant category was 30 years and highest age was 72 years.

Type of the lesion	No. of cases	Mean age of patients (in years)	Most common clinical presentation	Salient microscopic features
Non neoplastic	**40**	-	-	-
a. Infectious	5	-	-	-
1. Molluscum Contagiosum (MC)	1	34.2	Pearly white umbilicated nodule	Epidermal hyperplasia with large intracytoplasmic eosinophilic inclusions (molluscum bodies)
2. Condyloma acuminatum	4	30.6	Polypoid growth	Stratified squamous keratinised epithelium with papillomatosis, irregular acanthosis, koilocytic change and nucleomegaly
b. Non infectious inflammatory	35	-	-	-
1. Lichen Sclerosus (LS)	10	42.4	Atrophic plaque with hypopigmentation	Epidermal thinning with loss of rete ridges, hydropic degeneration of the basal layer, dermal oedema and fibrosis.
2. Lipomatous hamartoma	1	46	Nodule	Sheets of mature adipocytes admixed with fibrocollagenous muscle tissue and blood vessels.
3. Lichen planus	4	48.5	Violaceous plaques	Epidermal hyperplasia with acanthosis and hyperkeratosis, hydropic degeneration of the basal layer with dense collection of lymphocytes in dermoepidermal junction and few civatte bodies in epidermis.
4. Epidermal cyst	6	43.2	Cystic lesion	Cyst lined by stratified squamous epithelium with keratin material.
5. Bartholin cyst	10	51.2	Cystic lesion	Cyst lined by flattened epithelium with focal squamous metaplasia, mucous glands and focal collection of lymphocytes.
6. Gartner duct cyst	4	44.2	Cystic lesion	Cyst lined by cuboidal epithelium.
Neoplastic	**42**	-	-	-
a. Benign	27	-	-	-
1. Hidradenoma Papilliferum (HP)	4	44.6	Fleshy coloured nodules	Circumscribed tumour composed of papillary fronds, tubules and glandular structures lined by cuboidal epithelium with focal apocrine type of cells with intact myoepithelial layer.
2. Lobular capillary haemangioma	6	47.4	Grey white- reddish nodule	Lobular pattern of vascular proliferation with areas of oedema and mild chronic inflammatory cells.
3. Fibroepithelial polyps	12	41.8	Normal to hyperpigmented growth	Polypoidal growth lined by stratified squamous keratinised epithelium with subepithelial adipocytes admixed with fibrocollagenous tissue.
4. Angiomyxoma	4	47.5	Greyish-white growth	Dermal tumour with vague nodularity composed of bland oval to spindle shaped cells admixed with delicate vasculature in an abundant myxoid stromal background.
5. Leiomyoma	1	50	Swelling with overlying normal skin	Spindle shaped cells arranged in intersecting fascicles and whorling pattern with bland cigar shaped nucleus.
b. Malignant	15	-	-	-
1. Squamous cell carcinoma	14	56.0	Irregular verrucous growth with raised edge	Sheets and nests of polygonal cells exhibiting pleomorphism with keratin pearls.
2. Extramammary pagets disease	1	58	Erythematous to hyperpigmented plaques with irregular border	Large pale looking vacuolated cells arranged as single cells or in clusters just above the basal layer of epidermis.

[Table/Fig-1]: Table showing the concised results of the study.

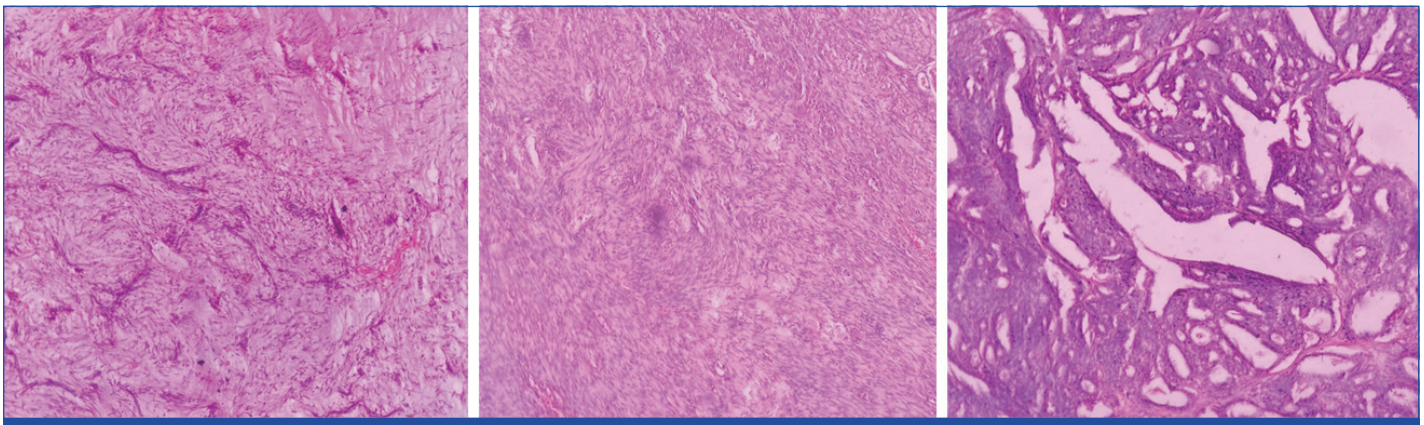


[Table/Fig-2]: Clinical photograph of a patient with Molluscum Contagiosum (MC) showing multiple pearly white umbilicated nodules.

[Table/Fig-3]: Clinical photograph of a HIV positive patient with condyloma acuminatum showing polypoidal growth.

in People Living With HIV/Acquired Immunodeficiency Syndrome (AIDS) (PLWHA) [8]. The infection commonly affects children aged 2-5 years with an average incubation period of 2-7 weeks. Common sites of predilection are trunk, face and limbs in immunocompetent individuals and transmitted either by direct contact or through fomites or autoinoculation. Hot and humid climate increases the risk of acquiring the infection. Genital MC affects sexually active adults most commonly and transmitted through sexual contact. The lesions are seen on genitalia, pubis, inner thighs and rarely on face and scalp. The diagnosis is mostly clinical with the characteristic presentation of pearly white, dome shaped, discrete, umbilicated papules. PLWHA can present with large, non umbilicated or agminate or tender nodular lesions and are difficult to treat [9]. Histopathological examination shows cup shaped indentation with hyperplastic epithelium and intracytoplasmic eosinophilic inclusion bodies called as Henderson-Peterson bodies. The differential diagnoses include syringoma and verruca. Basal cell carcinoma, keratoacanthoma, cryptococcosis, histoplasmosis need to be considered in large, atypical and extensive lesions. The lesions are usually self-limiting but take many months to heal. Treatment is done to reduce the stigma and transmission [8]. The authors had four cases of female genital MC with classical presentation of asymptomatic pearly dome shaped umbilicated papules over labia and inner thighs as shown in the [Table/Fig-2]. Histopathological evaluation was done to rule out the malignancy. It showed cup shaped indentation of hyperplastic epidermis with rete ridges proliferating downwards and encircling the dermis with characteristic Henderson-Peterson bodies within the epidermis.

Condyloma acuminata, also called genital warts are caused by Human Papilloma Virus (HPV). There are over 100 strains of HPV



[Table/Fig-4]: Microscopic image (H&E, 10x) of Angiomyxoma showing bland oval to spindle shaped cells admixed with delicate vasculature in a myxoid background.
[Table/Fig-5]: Microscopic image (H&E, 10x) of Leiomyoma showing spindle shaped cells arranged in intersecting fascicles and whorling pattern with bland cigar shaped nucleus.
[Table/Fig-6]: Microscopic image (H&E, 10x) of Hidradenoma papilliferum showing tubules and glandular structures lined by cuboidal epithelium with intact myoepithelial layer. (Images from left to right)

DISCUSSION

Vulvar lesions pose a diagnostic challenge to both clinicians and pathologists due to their overlapping symptoms and histopathological complexity. They range from dermatoses to invasive carcinomas. The usual symptoms of vulvar lesions includes itching, pain, swelling and mass in the vulvar region [4]. Biopsy followed by histopathological examination is mandatory for all the vulvar lesions for accurate diagnosis and to decide subsequent therapy. For dermatoses, punch biopsy after proper clinical assessment to locate the site of biopsy is advocated. Whereas, lesions presenting with swelling or mass, excisional biopsy with surrounding normal tissue to comment on the invasion is required [2,5]. Topical agents like toluidine blue, diluted acetic acid have been used to identify the dysplastic/suspicious tissues [6].

The MC is a common viral skin infection caused by double-stranded Deoxyribonucleic Acid (DNA) pox virus, belonging to the genus Molluscipox [7]. Four subtypes are known, of which MC Virus-1 (MCV-1) is the commonest. MCV-2 causes infection commonly of which, 40 cause anogenital warts and the commonest are 6 and 11. High-risk subtypes causing malignancy are most commonly 16 and 18. HPV also causes cutaneous and mucosal warts, palmar and plantar warts, Bowen's disease, epidermodysplasia verruciformis, non melanoma skin cancers and cervical, anogenital and oral intraepithelial neoplasia and carcinomas [10]. In the present study, there were four cases of condyloma acuminata presenting with polypoid growth in the vulvar region. One case was tested HIV positive [Table/Fig-3]. Excision biopsy was done to confirm the diagnosis. Lichen Sclerosus (LS) is the most common vulvar lesion, in postmenopausal women and is associated with pruritis. LS has an increased risk of developing vulval carcinomas ranging from VIN to squamous cell carcinoma. Biopsy is advised in these cases to confirm the clinical diagnosis and exclude malignancy [11]. The gold standard treatment is ultrapotent topical steroids like clobetasol propionate. Follow-up is required in all these cases. Present study includes 10 cases of LS presented with atrophic plaques and pruritis [12]. Epidermal thinning with loss of rete

ridges, hydropic degeneration of the basal layer, dermal oedema and fibrosis are seen.

The PG also known as 'Lobulated capillary haemangioma', is a benign vascular lesion of the skin and mucous membranes, rare in the vulvar area [13]. PGs usually present as small polypoidal lesions and can ulcerate. This study reports six cases of PGs, one case with marked surface ulceration. Microscopically, the lesions comprise of lobular arrangement of capillary sized vessels with loose fibrous stroma and few inflammatory cells with epidermal collarette with surface thinned out epidermis. The proposed mechanism in these lesions is an imbalance between the proangiogenic and antiangiogenic factors causing vascular proliferation. In pregnant women, PGs are hormonal induced. PGs are also seen more in association with use of medications like retinoids, antineoplastic drugs and immunosuppressants [14]. FEPs also called as 'Acrochordons' are benign lesions of the vulva and vagina in the adult women. They originate from a regressing nevus. The tumours may exhibit hypercellularity, pleomorphism and high mitotic activity mimicking malignancies and biopsy is necessary for a definite diagnosis [15]. FEPs are polypoidal or fleshy outgrowths with smooth surfaces, often arise in areas of skin irritation or as a process of skin aging and also due to hormonal changes (high levels of oestrogen and progesterone). 12 cases of FEPs ranging from size 2×1×1 cm to 5×4×3 cm were reported in the present study. Microscopically, the lesions are polypoidal and are lined by stratified squamous epithelium with fibrocollagenous tissue and few scattered inflammatory cells. One lesion showed surface ulceration, as larger lesions are more prone for secondary inflammation and ulceration [16].

The AA is a rare tumour, locally aggressive in the pelvic perineal regions. In 1983, Steeper and Rosai named this lesion as AA because of its local recurrence and infiltrative nature- WHO categorises this under 'tumour of uncertain differentiation'. Clinically, it presents as a painless slow growing mass and most of the times misdiagnosed as vaginal cyst such as Bartholin gland cyst or Gartner duct cyst. Due to its high potential for recurrence, a regular follow-up is essential. These can attain larger sizes upto 10 cm [17]. The present study revealed four cases of AA with sizes of 5×4 cm and 7×6 cm. One of the lesions was diagnosed clinically as a recurrent sebaceous cyst. On gross examination, the tumours were lobulated, tan grey with gelatinous to myxoid cut surface. Microscopically, these are hypocellular tumours composed of oval to spindle stellate cells without atypia embedded in myxoid stroma with delicate vasculature [Table/Fig-4]. These tumours are usually treated by excision with 1cm wide margin. They have a 30% chance of recurrence and usually have only one recurrence [18]. As most of these lesions exhibit Estrogen Receptor (ER) and Progesterone Receptor (PR) positivity, Gonadotropin Releasing Hormone (GnRH) analogues are highly useful in reducing the sizes in case of larger lesions, making complete excision feasible [19]. Leiomyomas of the vulva are rare tumours, benign in nature and are confused with Bartholin cyst clinically. In the present study, a case presenting as left vulvar mass of size 4×3 cm at the vaginal introitus. Fine Needle Aspiration Cytology (FNAC) was done initially and cytology showed few spindle shaped cells in a marked haemorrhagic background. As excision was advised, the excised tumour and histopathological evaluation showed a circumscribed tumour with spindle shaped cells arranged in intersecting fascicles and whorls with bland looking cigar shaped nuclei [Table/Fig-5]. Surgical excision is the treatment of choice and most of the times diagnosis is done postoperatively by histopathology [20].

According to histopathology, benign tumours of the vulvar region, considered as adenomas of the mammary like anogenital glands based on their histogenesis [21]. This study includes four cases of HP presenting as a flesh coloured solid to cystic nodule. Microscopic examination showed circumscribed tumours with papillary fronds, tubules and glandular structures lined by cuboidal epithelium with focal apocrine type of cells with intact myoepithelial layer and areas of cystic change [22]. Similar microscopic findings were observed in the present study [Table/Fig-6].

About 90% of all the vulvar cancers are squamous cell carcinomas, the others include Melanoma, Paget's disease, Bartholin's gland tumour, Adenocarcinoma and Basal cell carcinoma [2]. Invasive squamous cell carcinoma takes a major share in the malignant lesions of the vulva. It is a very rare cancer to occur in the vulvar region, but can have significant morbidity and mortality. Vulvar Squamous Cell Carcinoma (VSCC) and VIN can be HPV-associated or HPV-independent. They have different clinical and histopathological findings. HPV-independent VSCC occurs in old-age and histologically has well-differentiated keratinising carcinomas, and the precursor lesions are differentiated VIN (dVIN). HPV-associated VSCC occur in younger age individuals and histologically had basaloid or warty carcinomas and usual Vulvar Intraepithelial Neoplasia (uVIL), sometimes associated with LS as a precursor lesion [23]. HPV16 is the most common type identified in these lesions. Other reported HPV types reported include HPV 18, 31, 33, and 45. Immunostaining with p53 and p16 (INK4a) can aid in detecting HPV association with VSCC. HPV associated VSCC stain positively for p16, whereas HPV-independent VSCC stains positively with p53. The most common histological type of VSCC is keratinising type, followed by basaloid and warty types. Although the pathways for development of HPV-associated and HPV-independent are different, not much difference has been observed in the prognosis of the tumours [24]. In the present study, 14 patients diagnosed as VSCC with a mean age of 56±11.24 years. Eight were postmenopausal and six were premenopausal. Nine of them presented with nodular growth in the vulvar region whereas, the other five presented with ulcerative growth over the vulva. Punch biopsy specimens were received in 13 patients and wide local excision of the growth with nodes from bilateral inguinal lymph nodal dissection was obtained from one patient. Keratinising pattern was observed histologically in eight of the cases and basaloid pattern was observed in six cases. Six patients from the premenopausal group tested positive for HPV and the remaining eight patients from the postmenopausal group tested negative for HPV.

Extra Mammary Paget's Disease (EMPD) is a relatively rare condition. It is more common in the apocrine gland predominant regions like penis, perineum and vulva. Its incidence is as low as 1-2% of all the vulvar malignancies and is slowly raising in the Asian population [25]. The most common presenting symptoms include pruritis, pain and oedema, leukoplakia, hyperkeratosis, ulceration and bleeding in high apocrine gland areas. It is often misdiagnosed pertaining to the multiple differential diagnoses for EMPD including LS, dermatitis, Tinea, vulvovaginitis, and intertrigo [26]. Histologically, Paget's disease has been classified into primary and secondary. Various theories have been established for the development of primary EMPD, which include [27,28]:

a. From the apocrine glands which are intra-epidermal, and from the basal layer.
b. From the inter-labial fold has mammary-like glands, which can give rise to paget's disease.
c. From the Toker cells, alleged to be the precursors of Paget cells.

Secondary paget's occurs due to epidermotropic metastases from underlying genitourinary or gastrointestinal malignancies [29]. The diagnosis of EMPD is confirmed by skin biopsy, which shows large cells with abundant amphophilic cytoplasm with buckshot distribution. Mucin Core Protein MUC5AC and gross cystic disease fluid protein-15 are usually positive in primary EMPD [30]. Both surgical and non surgical techniques have been established for the management of EMPD. Surgical procedures include a myriad of techniques ranging from a simple wide local excision to more radical

Variables	Present study	Ozdemir O et al., 2015 [1]	Bhat DM et al., 2019 [2]	Mohan H et al., 2016 [5]
Mean age of patients	39.5±15	46.27±14.32	3rd decade	38.2
Most common symptom	Itching and patches over vulva	Itching (47.9%)	Itching and /or papules	Itching and white plaque on vulva (50%)
Most common site involved	Labia majora	Labia majora (55.1%)	Labia majora	Labia majora (51.18 %)
Nature of lesions	**Non neoplastic** (48.78%) neoplastic (51.22%) Benign (32.9%) malignant and premalignant (18.29%)	**Non neoplastic** (65.4%) neoplastic (34.6%) Benign (30.8%) malignant and premalignant (3.8%)	**Non neoplastic** (50%) neoplastic (50%) Benign (26.47%) malignant and premalignant (11.76%)	**Non neoplastic** (55.29%) neoplastic (29.41%) Benign (46%) malignant and premalignant (54%)
Most common non neoplastic lesion	Lichen sclerosis et atrophicus (LSA) (25%)	Lichen sclerosis et atrophicus (LSA) (17.5%)	Lichen Sclerosus et Atrophicus (LSA) (23.52%)	Lichen sclerosus et Atrophicus (LSA) (38.30%)
Most common infectious lesion	Condyloma acuminatum (80%)	Condyloma acuminatum (11.8%)	Condyloma acuminatum (5.88%)	Condyloma acuminatum (7.41%)
Most common benign neoplastic lesion	Hidradenoma papilliferum (HP) (14.8%)	Fibroepithelial polyp (7.2%)	Hidradenoma papilliferum (HP) (8.82%)	Fibroepithelial polyp (52.17%)
Most common malignant neoplastic lesion	Squamous cell carcinoma (93%)	Squamous cell carcinoma (40%)	Squamous cell carcinoma (50%)	Squamous cell carcinoma (62.96%)

[Table/Fig-7]: Comparison of the present study with other studies [1,2,5].

techniques like partial and total vulvectomy. Mohs micrographic surgery and liner strip skin biopsy have also been reported useful for EMPD. Non surgical techniques include photodynamic therapy, radiation therapy, laser therapy and application of topical creams like Imiquimod, Bleomycin, and 5-fluorouracil (5-FU). These non surgical techniques are mostly as adjunct to surgical treatment [26]. The prognosis depends upon the invasion of the dermis. The more invasive the tumour is, the worse is the prognosis [30].

One case was diagnosed as EMPD in the present study. The patient was a postmenopausal woman with pruritis and whitish lesions over the vulvar region. Punch biopsy specimen was received for histopathological examination. Microscopically, amphophilic cytoplasm in large cells with buckshot distribution was seen and stained positive for MUC5AC. This is a table comparing the present study with various other studies published in the literature [Table/Fig-7] [1,2,5].

The mean age of patients in the present study was in the 3rd decade, similar to all the studies except for the study by Ozdemir O et al., (4th decade) [1]. Most common site of involvement was labia majora in all the studies. Itching has been reported to be the most common patients. Non neoplastic lesions were the most common lesions in all the studies. Bhat DM et al., reported an equal incidence of both neoplastic and non neoplastic lesions [2]. Lichen sclerosis et atrophicus was the most common non neoplastic lesion, whereas Squamous cell carcinoma is the most common malignant neoplastic lesion in all the studies [1,2,5].

Limitation(s)

Biopsy was not done in three cases of MC but has been diagnosed based on clinical findings. Since, the cases presented only in the past two years have been taken into consideration there might a change in the proportion of the cases over a long period of time. Some cases which did not require biopsy were not included in the clinical spectrum.

CONCLUSION(S)

Vulvar lesions cause apprehension to women in terms of both personal and sexual concerns. Along with the clinical history and physical examination, a biopsy of the lesion plays a very important role in proper diagnosis and treatment and in decreasing the patients' apprehension. The aetiology of vulvar lesions ranges from infective, inflammatory conditions to benign and malignant neoplasms. These could be due to sexually transmitted infections or due to sporadic or genetically-linked neoplasms.

REFERENCES

[1] Ozdemir O, Sari M, Ertugrul F, Sen E, Ilgin B, Atalay C. Spectrum of vulvar lesions in an obstetrics and gynecology outpatient clinic. Med Sci Int Med J. 2015;4(1):1876.

[2] Bhat DM, Mahajan VA, Kumbhalkar DT, Raut WK. Spectrum of vulvar lesions: Patient's anxiety, clinician's concern and pathologist's diagnostic challenge. Int J Reprod Contracept Obstet Gynecol. 2019;8(6):2506-14.

[3] Vlastos AT, Charvet I, Dellacasa I, Capanna F, Pelte MF, Thueler P, et al. Diagnosis of vulvar lesions by non invasive optical analysis: A pilot study. Rare Tumours. 2009;1(1):e8.

[4] Hanprasertpong J, Chichareon S, Wootipoom V, Buhachat R, Tocharoenvanich S, Geater A. Clinico-pathological profile of vulva cancer in southern Thailand: analysis of 66 cases. J Med Assoc Thail Chotmaihet Thangphaet. 2005;88(5):575-81.

[5] Mohan H, Kundu R, Arora K, Punia RS, Huria A, Mohan H, et al. Spectrum of vulvar lesions: A clinicopathologic study of 170 cases. Int J Reprod Contracept Obstet Gynecol. 2014;3:175-80.

[6] Tyring SK. Vulvar squamous cell carcinoma: guidelines for early diagnosis and treatment. Am J Obstet Gynecol. 2003;189(3 Suppl):S17-23.

[7] Singla C, Mahajan BB, Kaur T, Malhotra SK, Sharma N. Genital molluscum contagiosum in females-therapeutic efficacy and comparative evaluation of topical 10% and 20% potassium hydroxide. Indian J Sex Transm Dis AIDS. 2018;39(2):102.

[8] Badri T, Gandhi GR. Molluscum Contagiosum. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Sep 15]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK441898/.

[9] Sen S, Goswami BK, Karjyi N, Bhaumik P. Disfiguring molluscum contagiosum in a HIV-positive patient responding to antiretroviral therapy. Indian J Dermatol. 2009;54(2):180.

[10] Gormley RH, Kovarik CL. Dermatologic manifestations of HPV in HIV-infected individuals. Curr HIV/AIDS Rep. 2009;6(3):130-38.

[11] O'Keefe RJ, Scurry JP, Dennerstein G, Sfameni S, Brenan J. Audit of 114 non neoplastic vulvar biopsies. Br J Obstet Gynaecol. 1995;102(10):780-86.

[12] Pérez-López FR, Vieira-Baptista P. Lichen sclerosus in women: A review. Climacteric J Int Menopause Soc. 2017;20(4):339-47.

[13] Abreu-Dos-Santos F, Câmara S, Reis F, Freitas T, Gaspar H, Cordeiro M. Vulvar lobular capillary hemangioma: A rare location for a frequent entity. Case Rep Obstet Gynecol. 2016;2016:3435270.

[14] Sarwal P, Lapumnuaypol K. Pyogenic Granuloma. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Sep 15]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK556077/.

[15] Nucci MR, Young RH, Fletcher CD. Cellular pseudosarcomatous fibroepithelial stromal polyps of the lower female genital tract: An under recognized lesion often misdiagnosed as sarcoma. Am J Surg Pathol. 2000;24(2):231-40.

[16] Navada MH, Bhat PRB, Rao SV, Nagarathna G. Large fibroepithelial polyp of vulva. Case Rep Dermatol Med. 2011;2011:e273181.

[17] Djusad S, Sari YM, Tjahjadi H. Deep (aggressive) angiomyxoma of the vagina misdiagnosed as Gartner cyst: A case report. Int J Surg Case Rep. 2021;83:105948.

[18] Kura MM, Jindal SR, Khemani UN. Aggressive angiomyxoma of the vulva: An uncommon entity. Indian Dermatol Online J. 2012;3(2):128-30.

[19] McCluggage WG, Jamieson T, Dobbs SP, Grey A. Aggressive angiomyxoma of the vulva: Dramatic response to gonadotropin-releasing hormone agonist therapy. Gynecol Oncol. 2006;100(3):623-25.

[20] Ammouri S, Elkarkri C, Zeraidi N, Lakhdar A, Baydada A. Vulvar leiomyoma: A case report. Pan Afr Med J [Internet]. 2019 Apr 29 [cited 2022 Aug 25];32(208). Available from: https://www.panafrican-med-journal.com/content/article/32/208/full.

[21] El-Khoury J, Renald MH, Plantier F, Avril MF, Moyal-Barracco M. Vulvar hidradenoma papilliferum (HP) is located on the sites of mammary-like anogenital glands (MLAGs): Analysis of the photographs of 52 tumors. J Am Acad Dermatol. 2016;75(2):380-84.

[22] Kambil SM, Bhat RM, D'Souza DC. Hidradenoma papilliferum of the vulva. Indian Dermatol Online J. 2014;5(4):523-24.

[23] Singh N, Gilks CB. Vulval squamous cell carcinoma and its precursors. Histopathology. 2020;76(1):128-38.

[24] Del Pino M, Rodriguez-Carunchio L, Ordi J. Pathways of vulvar intraepithelial neoplasia and squamous cell carcinoma. Histopathology. 2013;62(1):161-75.

[25] Delport ES. Extramammary Paget's disease of the vulva: An annotated review of the current literature. Australas J Dermatol. 2013;54(1):09-21.
[26] Kosmidis CS, Sevva C, Roulia P, Koulouris C, Varsamis N, Koimtzis G, et al. Extramammary Paget's disease of the vulva: Report of two cases. Med Kaunas Lith. 2021;57(10):1029.
[27] Morris CR, Hurst EA. Extramammary Paget disease: A review of the literature-Part I: History, epidemiology, pathogenesis, presentation, histopathology, and diagnostic work-up. Dermatol Surg Off Publ Am Soc Dermatol Surg Al. 2020;46(2):151-58.
[28] McDaniel B, Brown F, Crane JS. Extramammary Paget Disease. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Dec 8]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK493224/.
[29] Carton I, Lebreton M, Tesson C, Henno S, Lavoué V, Levêque J, et al. Paget's disease of the vulva: A challenge for the gynaecologist. J Gynecol Obstet Hum Reprod. 2021;50(1):101896.
[30] Asel M, LeBoeuf NR. Extramammary Paget's Disease. Hematol Oncol Clin North Am. 2019;33(1):73-85.

PARTICULARS OF CONTRIBUTORS:
1. Associate Professor, Department of Pathology, KIMS, Amalapuram, Andhra Pradesh, India.
2. Consultant, Department of Dermatology, SS Hospital, Amalapuram, Andhra Pradesh, India.
3. Consultant, Department of General Surgery, SS Hospital, Amalapuram, Andhra Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Yadavalli RD Rajan,
Consultant, Department of General Surgery, SS Hospital,
Amalapuram, Andhra Pradesh, India.
E-mail: dryrdrajan@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Sep 22, 2022
- Manual Googling: Nov 29, 2022
- iThenticate Software: Dec 05, 2022 (6%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? NA
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Sep 16, 2022**
Date of Peer Review: **Oct 17, 2022**
Date of Acceptance: **Dec 10, 2022**
Date of Publishing: **Mar 01, 2023**