Review Article

Dermatoscopy of nonvenereal genital dermatoses: A brief review

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Abstract

The scope of dermatoscopy has now vastly expanded and shows promising use for characterization of both pigmentary and inflammatory dermatoses affecting the skin, nail, and mucosae. Due to concerns of contamination and spread of infection, dermatoscopy has not been widely studied for genital mucosal dermatoses. In this article, we review the dermatoscopic features of nonvenereal dermatosis affecting the genitalia. Although biopsy is required for a definitive diagnosis, dermatoscopy is useful to identify atypical and suspicious pigmentary lesions. For the inflammatory dermatoses and other benign dermatoses, presence of few characteristic findings can aid in the diagnosis.

Key words: Dermatoscopy, genitalia, mucoscopy, nonvenereal dermatoses

INTRODUCTION

Dermatoscopy has now become an integral part of the dermatologist's armamentarium. It serves as a useful noninvasive adjunct to clinical examination for both pigmented and other nonpigmented dermatoses. For the diagnosis of melanoma, it was found that the diagnostic accuracy was 15.6 times higher with the use of a dermatoscope than visual inspection alone.[1] This has led to the incorporation of dermatoscopy training as part of residency programs. Gradually, the scope of dermatoscopy has expanded to inflammatory and pigmentary diseases and has now been used to study the diseases of nails (onychoscopy)[2] and mucosa (mucoscopy).[3]

Dermatoscope provides a magnification of ×10 and employs a glass plate. Both contact and noncontact methods can be used, and a cross-polarized filter helps to better visualize the deeper structures.[4]

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Dermatologists were reluctant to routinely perform mucoscopy due to concerns regarding direct contact of the footplate with the mucosa and transmission of infections. However, innovative measures such as use of cling films and barrier footplates have now circumvented these concerns [Figure 1].[4,5] In this article, we briefly review the published literature on genital mucoscopy [Table 1].

NORMAL PHYSIOLOGICAL LESIONS OF THE GENITALIA

Vestibular papillomatosis

It is considered to be an anatomical variant of the vestibular mucosa but is often confused with genital warts causing unnecessary interventions. It is the female counterpart of pearly penile papules. Clinically, it is seen in the inner aspect of the labia minora as filiform projections. On dermatoscopy, it appears as

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transparent papillae with prominent fibrovascular core containing irregular vascular channels [Figure 2a]. Bases of the individual papillae remain separate. Dermatoscopy of genital warts demonstrates multiple irregular projections with tapering ends, which are less transparent and broader than vestibular papillomatosis [Figure 2b]. The papillary projections arise from a common base.[6] Hemorrhagic lesions in the form of black and red dots and streaks are also seen.[7]

Pearly penile papules

They are benign physiological structures present in a ring around the corona glandularis. They are also mistaken for condyloma accuminata. On dermatoscopy, they appear as white, slightly transparent cobblestone-like projections, with the central vascular core being comma shaped or can appear as a central dot [Figure 3].[8]

Sebaceous gland hyperplasia

The modified sebaceous glands found over the prepuce and distal to it are called Tyson's glands.

Figure 1: DermLite 4 with a barrier footplate

Sebaceous hyperplasia or ectopic sebaceous glands are commonly seen in the vermillion border of lips. In the genitalia, they are seen as pink-to-yellowish, tiny papules with umbilication. On dermoscopy, they appear as well-defined, yellowish structures with milky white ovoid material, which is slightly transparent [Figure 4]. They are surrounded by wreath-like nonarborizing vessels. Similar lesions can be seen at the mucocutaneous junction of the labia minora in females.[9]

Pigmented lesions

Pigmented lesions involving the genital mucosa are seen in around 10% of Caucasian women. In males, it involves the glans penis and in females, the vulva. This includes melanotic macules or lentigenosis, nevi, melanoma, angiokeratoma, seborrheic keratosis, squamous cell carcinoma, and basal cell carcinoma (BCC).[10]

Melanosis

Melanotic macules or melanosis are the most frequent pigmented lesions observed in the genital mucosa. It is thought to be a disorder of melanocyte

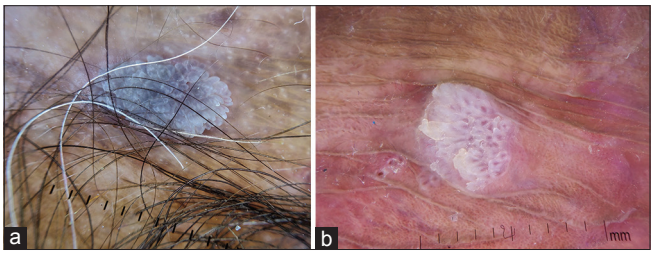

Figure 2: (a) Dermatoscopy of vestibular papillomatosis, translucent white papillomatous projections with vascular core. Bases of the individual papillae remain separate (DermLite-DL3N, ×10) (b) Dermatoscopy of genital warts, multiple irregular projections with tapering ends, which are less transparent and broader than vestibular papillomatosis. The papillary projections arise from a common base (DermLite-DL3N, ×10)

Table 1: Characteristic dermatoscopic features of few nonvenereal genital dermatoses

Genital dermatoses		Dermoscopic findings
Physiological conditions	Pearly penile papules (males) and vestibular papillomatosis (females)	Transparent papillary projections with central vascular core containing irregular vessels. Bases of the individual papillae remain separate
	Sebaceous hyperplasia	Yellowish umbilicated papules with whitish ovoid structures
Pigmented disorders	Mucosal melanosis	Ring like/parallel/structureless/reticular/globular pattern of uniform brownish pigmentation
	Genital nevi	Homogenous/globular pattern commonly seen. Atypical nevi have mixed pattern with blue-white veil
	Melanoma	Multicomponent structures with multiple colors. Blue, gray, and white colors have high predictive value. Blue-white veil Amelanotic melanoma-polymorphous vessels
Premalignant conditions	Extramammary Paget's disease and EQ	Reddish areas with glomeruloid vessels
Vascular disorders	Angiokeratoma of Fordyce	Reddish-to-dark blue lacunae with blue-white veil
Inflammatory dermatoses	Zoon's balanitis	Homogenous orange areas with curved vessels

EQ=Erythroplasia of Queyrat

Figure 3: Pearly penile papules arranged circumferentially around the corona. Clear projections with central vascular core can be appreciated on dermoscopy (DermLite-DL3N, ×10)

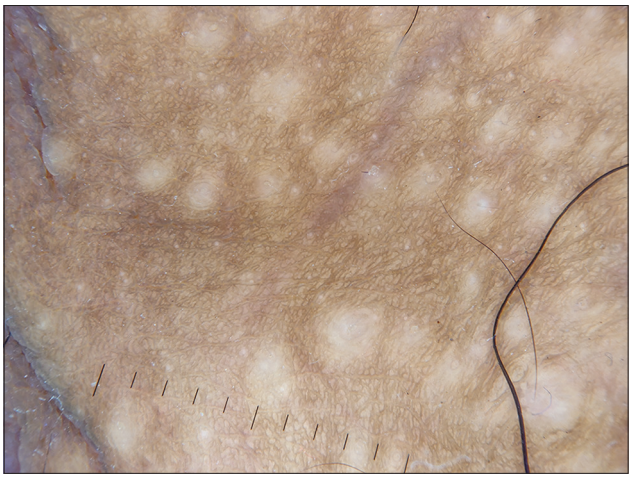

Figure 4: Dermatoscopy of sebaceous hyperplasia showing multiple yellowish discrete structures with whitish center seen on stretching the skin over the shaft of the penis (DermLite-DL3N, ×10)

transfer to the epidermal keratinocytes.[11] They have a predilection for the nonkeratinized mucosal areas rather than the hair-bearing areas of the external genitalia. They are benign pigmented macules, which are characterized on histopathology by increased basal layer pigmentation. It usually affects persons with skin types IV, V, and VI. They clinically present as single or multiple macules of color ranging from light brown to black and can range in size from 1 mm to 1 cm [Figure 5a]. They can often be mistaken for mucosal melanoma. However, standard algorithms such as ABCDE-asymmetry, borders, color, diameter, evolution; might not be suitable for evaluating genital pigmented macules.[10] Various patterns have been described on dermatoscopy as follows:

1. Ring-like pattern: Multiple ovoid structures with hyperpigmented borders appearing like grapes in some areas[12]
2. Parallel pattern: This can be seen in typical small macules affecting the lips, glans, and vulva. The pigment streaks are arranged in regular parallel lines [Figure 5b]
3. Structureless pattern: Here, structureless pigmented areas are seen with color ranging from light brown to dark blue-gray. Clinically, these macules are slightly larger in diameter[13]
4. Reticular or honeycomb: Similar to reticular pattern of cutaneous nevi where the pigment appears in a round-to-ovoid honeycomb pattern [Figure 5c]
5. Globular pattern: Round-to-ovoid dark brown globular structures.[14,15]

Genital nevi

These are even more uncommon, with the prevalence of vulvar nevi being 2.3% among cases of melanocytic nevi.[13] A subset of vulvar nevi have peculiar features on histopathology and are termed atypical melanocytic nevi of the genital type (AMNGT). Vulvar nevi are usually present in childhood in contrast to AMNGT, which is seen in women of reproductive age group. Vulvar nevi are flat or dome-shaped papules ranging from pink to dark brown-black or blue in color. They have regular borders and are uniformly pigmented. The globular and homogenous patterns are most frequently described on dermoscopy. In addition, milia-like cysts may also be seen. Other patterns such as parallel and cobblestone are also seen and are sometimes difficult to distinguish from vulvar melanosis which have similar patterns. At times, mixed patterns and peripheral streak-like pigmentation might raise the suspicion of a melanoma, and histopathology is advised to resolve this.[10,13] Divided nevi or kissing nevi of the penis, a type of congenital melanocytic nevi, have also been reported. This is a single nevus initially, which splits after epidermis invaginates to form the corona sulcus. Dermatoscopic features similar to cutaneous congenital melanocytic nevi such as dots and globules have been reported.[16] In a study on genital melanocytic nevi, the authors found that majority of the dermoscopic features were similar to that of cutaneous melanocytic nevi. However, in some cases, differentiation between melanosis and melanocytic nevi and between benign and malignant melanocytic tumors was not possible by dermatoscopy alone.[11] The practice of routine prophylactic biopsies of melanocytic nevi especially in children should be discouraged in the absence of any worrisome features clinically and on dermatoscopy.[17]

Atypical melanocytic nevi of the genital type

This accounts for 5% of all the benign melanocytic areas of the genitalia. The key histopathological features are as follows:[18]

1. Nested pattern: Round-to-ovoid nests of melanocytes of variable size which are oriented perpendicular or parallel to the dermoepidermal junction
2. Dyshesive nest pattern: Contiguous dyscohesive melanocytic nests which separate the epidermis from the dermal melanocytes
3. Crowded pattern: Closely arranged ill-defined nests of melanocytes which obscure the dermoepidermal junction.

Mixed pattern on dermatoscopy is most frequently seen. Parallel lines appear together with structureless areas or brown-to-black globules.[14,15] Blue-white veil and irregular dots have also been described. All cases with a mixed pattern on dermoscopy must undergo biopsy to rule out melanoma.[10]

BENIGN TUMORS

Seborrheic keratosis

Pigmented seborrheic keratosis, like its cutaneous counterpart, shows features like polypoidal structures, cerebriform pattern, and fat finger-like structures on dermatoscopy. Comedone-like openings, which are keratin-filled invaginations, are not seen in genital seborrheic keratosis due to constant friction. Milia-like cysts are commonly seen as they are embedded within the epidermis.[11,19]

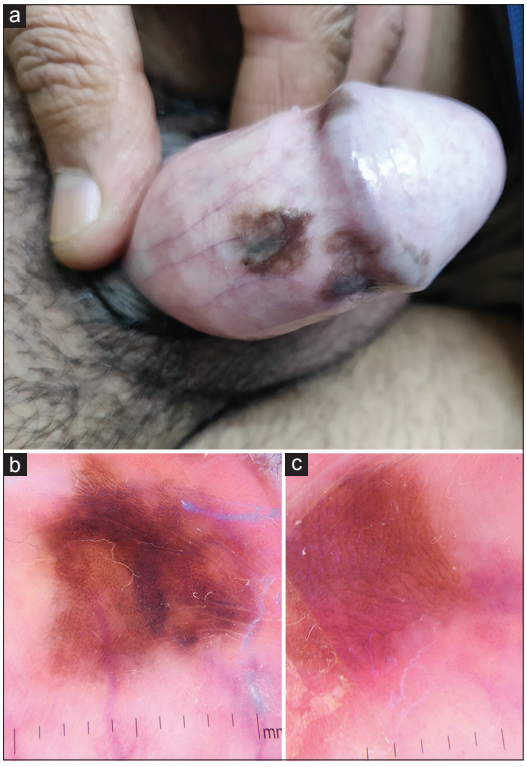

Figure 5: (a) Mucosal melanosis showing multiple brownish macules of size 4 cm × 3 cm over the glans penis and prepuce. (b) Dermatoscopy of mucosal melanosis showing reticular brownish structures appearing honeycomb like in some areas (DermLite-DL3N, ×10). (c) Parallel pattern – Streaks of brownish pigment appearing as parallel lines (DermLite-DL3N, ×10)

Verruciform xanthoma

They are rare tumors composed of lipid-laden macrophages, which clinically present as yellowish plaques and nodules with papillomatous surface in the anogenital areas. On dermatoscopy, numerous coalescing yellowish mulberry-like papules are seen with central hairpin-like vessels.[20,21]

PREMALIGNANT CONDITIONS

Extramammary Paget's disease

Extramammary Paget's disease is characterized clinically by erythematous plaques with oozing, ulceration, and scaling with nodules and focal hyperpigmentation. Areas of hypopigmentation may also be seen [Figure 6a]. On dermoscopy, milky red areas, vascular patterns, surface scales, ulcers, pigmentary structures, shiny white lines, and white structureless areas are observed in extramammary Paget's disease [Figure 6b]. The common vascular patterns noted are dotted vessels and glomeruloid vessels.[22] Pigmented Paget's disease is often mistaken for melanoma because of features such as irregular pigmented globules; white, negative pigment network; and structureless blue-gray areas.[23]

Erythroplasia of Queyrat

It is the genital counterpart of cutaneous Bowen's disease and shares similar dermatoscopic features. Glomeruloid vessels arranged in clusters or in a diffuse pattern are characteristic and are used to differentiate erythroplasia of Queyrat from other causes of chronic balanitis. In addition, linear vessels and brown dots may also be seen.[24]

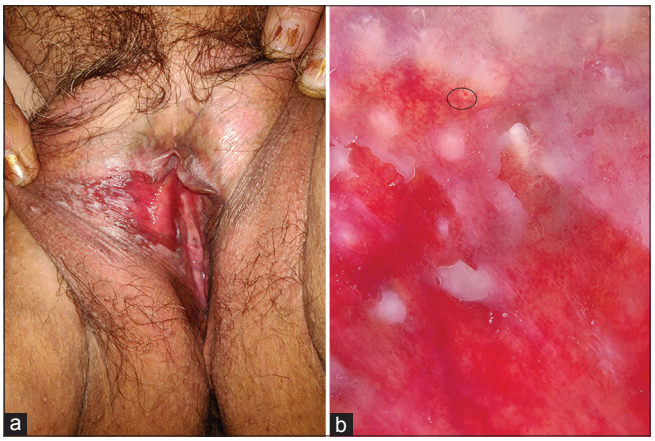

Figure 6: (a) Well-defined erosion over the labia minora. On histopathology, diagnosis of primary extramammary Paget's disease was confirmed. (b) Dermatoscopy of the lesion showing intense erythema, milky white areas, and glomeruloid vessels (DermLite-DL3N, ×10)

Dermatoscopic features in pigmented Bowen's disease include pigmented streaks in association with other findings such as comedo-like openings.[25]

Vulval intraepithelial neoplasia

This is a common cause for genital pruritus. Around 15% of vulval intraepithelial neoplasia is clinically pigmented. Typical findings are milky white to pink areas associated with dotted and glomerular vessels and papillomatous structures. In the pigmented variant, brownish dots with well-defined borders and a cerebriform appearance may be seen.[26]

MALIGNANT TUMORS

Melanoma

Vulvar melanomas account for 1%–3% of all melanomas seen in women. They frequently occur in older women and present as flat or raised pigmented lesions, which are often more than 7 mm in size. Amelanotic variants have also been described. Multiple colors and multicomponent patterns characterize the dermatoscopic appearance of mucosal melanomas.[11,27] Presence of blue, gray, and white colors with or without structureless areas had 100% sensitivity for the diagnosis of melanoma.[28] Reticular depigmentation and network of fine whitish lines are valuable in diagnosing early vulvar melanoma.[10] In amelanotic melanoma, whitish- to skin-colored papules with polymorphous vessels are seen on dermoscopy.[29] Asymmetry, multiple patterns, focal areas with blue-white veil, and presence of vessels should raise a suspicion of malignancy and must be confirmed by histopathology.[30]

Basal cell carcinoma

Dermoscopy of genital BCC is similar to cutaneous BCC showing blue-gray ovoid globules, whitish homogenous structures, and arborizing vessels. Nonpigmented lesions are difficult to diagnose and can mimic inflammatory lesions. Here, well-focused arborizing vessels help to clinch the diagnosis.[31]

VASCULAR LESIONS

Angiokeratoma

Angiokeratoma of Fordyce appears as multiple, well-defined, bluish black papules over the scrotum [Figure 7a]. They are often clinically mistaken for genital nevi, blue nevus, and melanoma. A report found that 20% of angiokeratomas were misdiagnosed as melanoma.[32] On dermatoscopy, well-defined, reddish-to-dark blue lacunae with bluish-white veil can be seen [Figure 7b].[33]

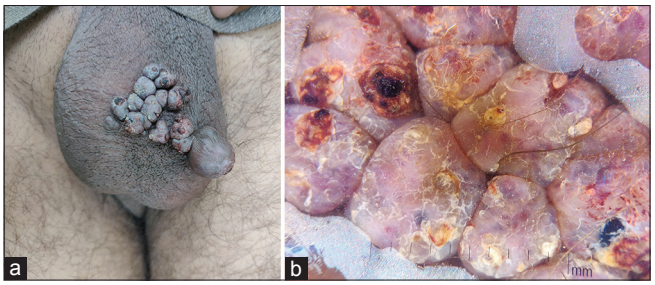

Figure 7: (a) Multiple well-defined, skin-colored-to-bluish nodular lesions of angiokeratoma over the scrotum. (b) Dermatoscopy shows reddish blue lacunae within the nodules. Scaling and hemorrhage are also seen (DermLite-DL3N, ×10)

Vulval lymphangiectasia

Acquired lymphedema and lymphangiectasia of the vulva usually arise due to damage to the lymphatics occurring after trauma, infections, malignancy, surgery, radiation, etc. Clinically, they present as flesh-colored papules or clear vesicles with a diffuse erythematous background. Puncturing the lesion can lead to discharge of clear fluid. On dermatoscopy, well-defined, round-to-oval reddish lacunae with whitish septa and numerous tiny punctiform lacunae are seen. This is similar to the appearance of lymphangioma circumscriptum. Dermatoscopy is useful when the lesions are sometimes confused with verruca or molluscum contagiosum.[34]

INFLAMMATORY DISORDERS

Zoon's balanitis

In this condition, well-defined, reddish plaques are seen over the glans or inner side of the prepuce [Figure 8a]. Dermoscopy characteristically shows homogenous reddish orange areas with curved vessels [Figure 8b].[24] The orange areas correspond to the hemosiderin deposition, and the curved vessels represent vascular proliferation. Other types of vascular structures seen are serpiginous vessels and convoluted, chalice-shaped, linear and dotted vessels.[35]

Candidal balanitis

Cottage cheese-like structures representing the fungal colonies and blurry linear vessels are characteristic of candidal balanitis.[24]

Psoriatic balanitis

Multiple erythematous papules and plaques are seen clinically. On dermoscopy, homogeneously distributed, dilated, and dotted vessels on an erythematous background are seen.[36]

Lichen planus

Thick, linear, and irregular hairpin-like vessels are seen diffusely over the lichen planus lesions.

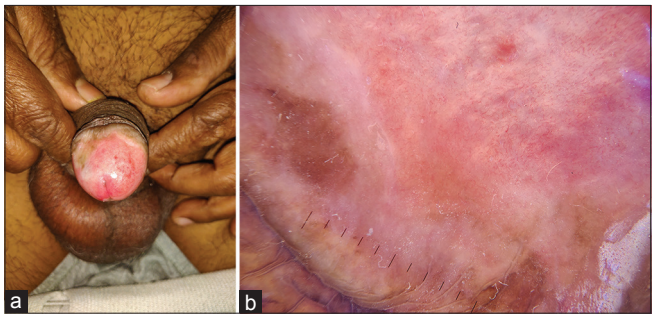

Figure 8: (a) Plasma cell balanitis showing well-defined erosion over the glans penis. (b) Dermatoscopy shows orange structureless areas with curved and serpiginous vessels (DermLite-DL3N, ×10)

Wickham's striae are characteristically noted on an intense red background.[5]

Lichen sclerosus et atrophicus

Ivory white atrophic plaques are seen over the glans and labia minora with destruction of the normal anogenital architecture [Figure 9a]. On dermatoscopy, white structures which also appear pinkish are seen, which correspond to sclerosis on histopathology.[36] Gray-blue dots are arranged in peppering pattern, which corresponds to the dermal melanophages. Marked decrease in the concentration of vessels and presence of polymorphic patterns of vessels are the hallmark features [Figure 9b].[5] Purpuric-to-red globules and blotches are seen especially in females, which correspond to the blood spots due to excessive scratching.

Lichen simplex chronicus

It is a chronic pruritic disorder characterized by lichenification, with varying degrees of excoriation caused by scratching and rubbing. The skin progressively thickens and becomes grayish brown. On dermoscopy, whitish gray structures with rich vascularization are seen. Vessels can be seen as linear, dotted, and serpentine patterns.[5]

CONCLUSION

Dermatoscopy has gained importance in the diagnosis of nonpigmented dermatoses and to differentiate the benign lesions from ambiguous and malignant lesions.[1,28] Many dermatologists in today's practice have incorporated dermatoscopy as a routine. Though it does not obviate the need for biopsy, it is useful to avoid unnecessary biopsies of benign lesions. It also helps us to carefully select the site for biopsy for suspicious or atypical pigmented lesions.

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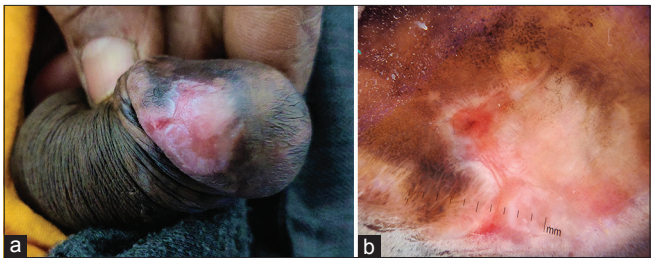

Figure 9: (a) Lichen sclerosus et atrophicus showing depigmented atrophic plaque with erosions over the glans penis. (b) Dermatoscopy shows white streaky structureless areas and gray-blue dots in peppering pattern, and polymorphous vessels can be appreciated (DermLite-DL3N, ×10)

Conflicts of interest

There are no conflicts of interest.

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