VERRUCOUS LESIONS OF SKIN

Abstract

Any exophytic/raised growth on the skin's surface or on any organ that resembles a wart is described as verrucous lesion. Not all verrucous lesions are caused by the human papillomavirus (HPV), there are both infectious and non-infectious etiologies. These lesions are very similar to each other and histopathology is needed to categorize them. This chapter aims to highlight specific histological characteristics seen under light microscopy that can aid pathologists in categorising common exophytic/verrucous lesions.

Keywords: Exophytic, verrucous, infectious and histopathology.

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I. INTRODUCTION

Verrucous lesions are described as having a growth pattern that resembles a wart. Verrucous can be used to describe any exophytic/raised growth on the skin's surface or on any organ. Contrary to popular perception, not all verrucous lesions are caused by the human papillomavirus (HPV). A number of them have an outward appearance of warts, but their behaviours and prognoses are quite different. Their differentiation depends heavily on histopathology.[1] This chapter aims to highlight specific histological characteristics seen under light microscopy that can aid pathologists in categorising common exophytic/verrucous lesions and distinguishing them from similar-looking lesions. We also want to familiarise practitioners with these conditions so that they can accurately differentiate between them when conducting a biopsy and collect enough tissue for histological analysis.

II. CLASSIFICATION OF VERRUCOUS LESIONS OF SKIN

1. Infectious causes :[2,3]

- Viral – Wart
- Bacterial – Tuberculosis verrucosa cutis
- Lupus vulgaris
- Fungal – Chromoblastomycosis
- Fixed cutaneous sporotricosis
- Cutaneous rhinosporidosis
- Cutaneous blastomycosis
- Coccidioidomycosis
- Ectoparasite – Crusted scabies

2. Non infectious causes

- Papulosquamous – Hypertrophic lichen planus
- Psoriasis
- Eczema _ Lichen simplex chronicus
- Prurigo _ Prurigo nodularis
- Collagen vascular disorder – Hypertropic variant of Discoid lupus
- erythematosus
- Deposition disorders – Lichen amyloidosis
- Lipoid proteinosis.
- Keratinization disorders – Porokeratosis
- Acrokeratosis verruciformis
- Darier’s disease
- Benign tumor – Seborrhoeic keratosis
- Stucco keratosis
- Pigmentary disorder – Incontinentia pigmenti
- Nevi – Verrucous epidermal nevi
- Disorder of lymphatics – Lymphangioma circumscriptum
- Elephantiasis nostros verrucosa cutis
- Disorders of blood vessel – Verrucous hemangioma

- Angiokeratoma circumscriptum
- Phlebolymphedema
- Acantholytic disorders – Warty dyskeratoma
- Malignancy – Verrucous carcinoma
- Verrucous variant of malignant
- melanoma
- Kaposi sarcoma
- Neuropathy associated – Leprosy
- verrucous skin lesions Diabetes Mellitus

III. THE VIRAL WART

The virus that causes viral warts and infects stratified squamous epithelium, whether it is keratinizing or not, is HPV. Warts on the skin can appear at any age. uncommon in infants and young children. In school-age children, adolescence, and early adulthood, the incidence peaks.[4,5] Variable from a few weeks to years, depending on the manner of dissemination and the incubation time. Inoculation of the virus into the basal epidermal layer occurs when the epithelial barrier function is lost due to trauma, maceration, or a combination of the two. Plantar warts are typically contracted from shower or pool flooring.[6]

1. **Virus:** Double-stranded DNA viruses are papillomaviruses. These viruses will merge with the DNA of the host. It has a 55 nm size. There are more than 200 genotypes of HPV that can harm mucous membranes and skin. Numerous different virus types have been linked to epidermal cancers. They engage in interactions with the host cell's E6 and E7 proteins. Except for plantar warts, common warts are primarily brought on by HPV-2, 1, 4, 27, and 57 serotypes.[7,8]

2. **Clinical characteristics:** Less than 1 mm to more than 1 cm in diameter, firm papules with a rough, horny surface. The backs of the hands and fingers are a frequent location. Months pass by with a single wart remaining untouched. Sago-grain papule is the first sign of a plantar wart. Subsequently develops into a spherical lesion that is sharply defined, with a smooth collar of thickened horn surrounding a keratotic, rough surface. Small bleeding sites are visible while paring. This makes it easier to tell this wart apart from a corn foot.[8]

3. **Histopathology:**[9,10] At the edge of the verruca, twisted inward so that it appears to point radially toward the centre (arborization), are hyperkeratosis, vertical tiers of parakeratosis, acanthosis, papillomatosis, and elongated rete ridges. Koilocyte foci are found in the stratum malphigii. Small, spherical, highly basophilic nuclei with a distinct halo and pale colouring cytoplasm are features of koilocytes.

4. **Hypertrophic Lichen Planus** [Lichen planus verrucosus]**:** Lichen planus is a common inflammatory condition that affects the skin, nails, mucous membranes, hair, and tree moss (Greek leichen, "tree moss," Latin planus, "flat").[11]

5. **Clinical characteristics:** Commonly occurring interphalaneal joints, shins, and ankles with hypertrophic lichen planus. Between the ages of 30 and 60, two thirds of cases take place. There isn't any sexual preference. The lesions are frequently verrucous,

symmetrical plaques with pruritus that have a centre area that is depigmented and a rim that is hyperpigmented. These lesions scar as they recover. It is typically resistant to treatment. Hypertrophic lichen planus is frequently accompanied by chronic venous stasis. Rarely can it progress to squamous cell carcinoma. In distal extremities, malignant transformation occurs more frequently. It takes at least 12 years from the time hypertrophic lichen planus is diagnosed till cancer.[12,13]

6. **Histopathology:** Basal layer vacuolar degeneration, irregular acanthosis, pseudoepitheliomatous hyperplasia, hypergranulosis, and compact orthokeratosis. Infiltration of lymphocytes near the base of rete ridges. Vacuolar degenerations at the interface are distinct and frequently located at the base of rete ridges. The papillary dermis and lower epidermis both contain necrotic keratinocytes.[14]

7. **Verrucous psoriasis:**[15:] There are two distinct forms of this uncommon psoriasis variation. They are crater-shaped papules with a central depression and dome-shaped papules with keratotic plugs.

8. **Clinical characteristics:** These lesions coexist with other, more typical psoriatic lesions.

9. **Histopathology:**[16] In addition to epidermal hypogranulosis, dilated, tortuous capillaries, parakeratosis, epidermal acanthosis with extension of rete ridges, thin suprapapillary epidermal plates, and a lymphocyte-predominant inflammatory infiltrate that may contain admixed neutrophils in the papillary dermis.The most distinct signs of psoriasis are, respectively, "Munro microabcesses" and "spongiform pustules of Kogoj." Verrucous psoriasis is suggested by papillomatosis, epithelial buttressing, and the lack of infection.

IV. TUBERCULOSIS VERRUCOSA CUTIS: (WARTY TUBERCULOSIS) [17]

A warty, sluggish, plaque-like form of tuberculosis brought on by the injection of Mycobacterium tuberculosis into a patient who has already been sick. There will be a high or moderate level of immunity in this patient. Few organisms are present in these lesions (paucibacillary).[18]

1. **Pathogenesis:** There are three ways to vaccinate an organism.

   - Accidental hyper infection from external sources: traditionally, post-mortem attendants, pathologists, and doctors are at risk (also known as "anatomist's warts," "prosector's warts," or "verruca necrogenica").
   - Sputum autoinoculation in a tuberculosis patient who is still ill.
   - Children and young adults who are already infected but have some immunity may contract the disease from sputum by sitting on the ground or going barefoot.[19]

   Clinical characteristics: Common sites are those exposed to trauma, infectious sputum, or other TB material. The lesion begins as a tiny, indurated, warty papule that is asymptomatic and slightly inflamed. The formation of a verrucose plaque occurs gradually. The colour is either red, brown, or purple. The majority of the consistency is hard, with very few regions of softening. These soft spots and fissures both have the potential to release pus.

Histopathology:[20] Hyperkeratosis, acanthosis, and pseudoepitheliomatous hyperplasia are its defining features. creation of a neutrophilic abcess in the upper dermis. Tuberculoid granulomas with a moderate level of necrosis are visible in the middermis. When compared to lupus vulgaris, this illness has a higher number of tubercle bacilli.

2. **Lupus Vulgaris:** A paucibacillary type of cutaneous tuberculosis with a chronic and progressive history is lupus vulgaris. Patients with moderate to high levels of immunity commonly experience it. Lupus vulgaris is caused by lymphatic, haematogenous, or contiguous spread.

   Clinical characteristics: Lower limbs and buttocks are frequent locations in developing nations, especially in youngsters.[22] A small, reddish-brown, pliable flat plaque with a gelatinous nature initially appears. These lesions slowly spread to the sides and exhibit atrophy in some regions. On a diascopy, apple jelly nodules are visible. Except in widespread versions, it often presents as a solitary lesion. Spreading like a sporotrichid can occur.[23] Depending on how the local tissue reacts to the infection, there are five clinical types that are known. These categories include plaque, papular, nodular, and tumor-like forms as well as vegetative, ulcerative, and mutilating forms.

   Histopathology: There are ulcers and atrophy in the epidermis. Hyperkeratosis, acanthosis, papillomatosis, and pseudoepitheliomatous hyperplasia are all signs of hyperplastic lesions. The top dermis has a tuberculoid granuloma with epithelioid large cells. Within the tubercle, caseation necrosis is minimal or nonexistent. The healing process results in extensive fibrosis. Rarely are bacilli observed.

3. **Seborrheic keratosis[25]:** Elderly people frequently develop seborrheic keratosis, a benign tumour primarily made of epidermal keratinocytes. It typically happens during the fifth decade of life. Tropical nations frequently have these lesions.
   - **Clinical features:** Superficial verrucous plaque that seems to be adhered to the skin.
   - **Histopathology**: Church spire pattern caused by hyperkeratosis, acanthosis, and significant papillomatosis with melanocyte proliferation in the immature keratinocytes.[26]

4. **Verrucous carcinoma:** Ackerman originally used the phrase in 1948. It is a tumour that grows slowly and has a propensity to return locally. Rarely does it spread. It is a kind of squamous cell carcinoma characterised by exophytic tumours that grow slowly.

   Clinical features: Cauliflower-like lesions at the site of prolonged irritation are its defining feature. According to the anatomical place of involvement, there are four categories. (a) Oral florid papillomatosis - a verrucous carcinoma of the oral cavity (b) Giant condyloma of Buschke and Lowenstein - a verrucous carcinoma of the genitoral region (c) Epithelioma cuniculatum - a verrucous carcinoma of the plantar region (d) Cutaneous verrucous carcinoma - a verrucous carcinoma that develops in other regions. Verrucous carcinoma's pathophysiology is not entirely known.

Epithelioma cuniculatum is a locally destructive, slow-growing, low-grade tumour. It is typically found on the sole of the foot. It may involve periunguium, mucosa and other locations. On the distal portion of the foot's sole, it appears as a warty, mushy bulbous mass with ejection of foul-smelling yellow substance. On the surface, there are several sinuses that can open and exude oily, rancid, and foul-smelling substances. The anterior portion of the foot's sole that bears weight is the typical site of involvement. Plantar fascia may be impacted by a tumour as it spreads locally. It may break metatarsal bones as it moves toward the dorsal area of the foot.[29]

5. **Histopathology:** Verrucous cancer must be diagnosed with a large, deep biopsy. There will be well-differentiated keratinocytes with a tiny nucleus, as well as hyperkeratosis, parakeratosis, and acanthosis. The tumour pushes aside the collagen bundles by compressing them with its massive, bulging downward growth and keratin-filled cyst in the centre. Therefore, rather than stabling, the tumour has a bulldozing effect. Nuclear atypia, individual cell keratinization, and horn pearls are not present in the deeper areas.

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