ECRONICON OPEN ACCESS

EC CLINICAL AND EXPERIMENTAL ANATOMY

Commentary

Spinous and Granular Adaptation-Epidermolytic Acanthoma

Anubha Bajaj*

Consultant Histopathologist, A.B. Diagnostics, India

***Corresponding Author**: Anubha Bajaj, Consultant Histopathologist, A.B. Diagnostics, India.

Received: June 18, 2019; **Published:** July 15, 2019

Preface

Epidermolytic acanthoma was preliminarily elucidated by Shapiro and Baraf in 1970. Epidermolytic acanthoma (EA) is currently enunciated as an exceptional, distinctive, benign tumefaction engendered within the superficial epidermis. Epidermolytic acanthoma is cogitated as solitary cutaneous tumour which is identical to the emergence of viral warts.

Pathogenesis of epidermolytic acanthoma demonstrates the influence of exogenous factors such as ultraviolet light, viral infection or trauma. The aforesaid factors enhance the metabolic activity of keratinocytes along with aberrant elucidation of keratin genes [1,2].

Disease characteristics

Epidermolytic acanthosis is a neoplasm of obscure aetiology. Children and elderly adults within fifth to seventh decade are frequently implicated. Male predominance of the benign neoplasm is delineated. Frequently incriminated sites incorporate the genitalia (scrotum, vulva), trunk and extremities.

Epidermolytic acanthoma is a cogent component of disorders exemplifying epidermolytic hyperkeratosis. Characteristic manifestations include compact hyperkeratosis in addition to granular and vacuolar cellular degeneration. Aforesaid histological modifications are delineated in specific clinical scenarios such as within zones adjacent to various malignant tumours or inflammatory disorders besides being demonstrated in hereditary diseases such as keratinopathic ichthyosis, Vorner's palmoplantar keratoderma, epidermolytic epidermal nevi and acrosyringial epidermolytic papulosis neviformis. Epidermolytic acanthoma is categorized into solitary and disseminated forms [2,3].

Disease pathogenesis

Enunciation of benign and malignant cutaneous tumefaction is a significant phenomenon in immune suppressed individuals or organ transplant recipients. Immune suppression is considered as a cognitive pathogenic mechanism in the emergence of epidermolytic acanthoma. Immune suppression prohibits immune surveillance and prevents the detection or elimination of aberrant keratinocyte clones. Additionally, immune suppression permits the latent, atypical keratinocyte clones to proliferate. Therapeutic immune suppression in conjunction with co-carcinogenic factors can augment the tumour incidence.

Epidermolytic acanthoma is contemplated as a localized variant of generalized hereditary epidermolytic hyperkeratosis. The specific hereditary disorder of keratinisation elucidates somatic mutations of keratin 1 and keratin 10 (KRT1 and KRT10 genes) which are implicated in the pathogenesis of isolated epidermolytic keratosis [3,4].

Concurrence of epidermolytic acanthoma with human papilloma virus (HPV) is inconsistent and incompletely defined. Epidermolytic acanthoma can recapitulate a wart like extraneous appearance, however viral (HPV) DNA is lacking in such lesions. Molecular studies depict an absence of the viral (HPV) genome and immune-staining for p16 is perpetually non-reactive in solitary or multiple lesions.

Epidermolytic acanthoma generally occurs in the absence of preceding sexually transmitted diseases or hazardous sexual conduct. Attributes such as trauma and chronic scratching are implicated in the genesis of epidermolytic acanthoma.

Epidermolytic acanthoma can be associated with disorders such psoriasis. Pathogenesis of isolated (solitary) and disseminated variants of epidermolytic acanthoma are obscure [4,5].

Clinical elucidation

Miniature, asymptomatic, solitary or disseminated, skin coloured or whitish, pigmented, keratotic, fleshy papules with a verruciform superficial surface, ranging from one millimetre to two millimetre diameter are cogitated, particularly on the torso.

Alternatively, solitary, brownish, verrucous or keratotic, gradually progressive papule of one centimetre dimension is discerned. Epidermolytic acanthoma is exemplified into solitary and disseminated subcategories. Solitary variant is denominated as "isolated epidermolytic acanthoma" and multiple, dispersed lesions are cogitated as "disseminated epidermolytic acanthoma (DEA)".

Isolated epidermolytic acanthoma and disseminated epidermolytic acanthoma are components of acquired epidermolytic hyperkeratosis whereas congenital epidermolytic hyperkeratosis incorporates disorders such as bullous congenital ichthyosiform erythroderma, systemized epidermal nevus and hereditary palmoplantar keratosis [2,3].

Isolated lesions can appear at any location. However, lesions of the disseminated variant are frequent on the back, genitalia and scrotal regions.

Solitary lesions and isolated epidermolytic acanthoma can arise in concurrence with immune suppression.

Disseminated epidermolytic acanthoma can be associated with conditions such as disseminated superficial porokeratosis and verruca vulgaris. Lesions are particularly demonstrated in immune suppressed individuals such as renal transplant recipients besides occurring in subjects administered with psoralen and ultraviolet A (PUVA).

Lesions can be pruritic and lichenification ensues with the emergence of chronic lesions. Clinical presentation is characteristic and points to the diagnosis [5,6].

Histological elucidation

Shave biopsy can be adopted for appropriate histological enunciation. Epidermolytic hyperkeratosis is a persistent lesion and is singularly devoid of adjunctive attributes of epidermal tumours.

Characteristic histology of epidermolytic acanthoma is delineated by the enunciation of compact epidermolytic hyperkeratosis along with random emergence of clear spaces of varying magnitude circumscribing the nuclei of stratum spinosum and granulosum.

Additionally, foci of reticulated, delicately stained epithelial cells with indistinct cellular boundaries, an intense granular zone with keratinocytes, spinous layer with cytoplasmic vacuolization, a component of coarse abundant, irregular, basophilic keratohyaline bodies and eosinophilic inclusions are exhibited. Foci of dysplasia are absent [7,8].

Epidermolytic acanthoma displays prominent orthokeratosis, hyperkeratosis, papillomatosis and acanthosis. Hypergranulosis is accompanied by depiction of several, enlarged, clear cells with a distinct peri-nuclear zone within the granular and upper spinous epithelial layers, basophilic keratohyaline granules and accumulation of an eosinophilic substance. Nevertheless, morphological differentiation amidst epidermolytic acanthoma and adjunctive squamous proliferations is challenging.

Epidermolytic acanthoma depicts four distinct histological patterns, a concurrence of which can be described in a singular lesion. Polypoid lesions are enunciated in conjunction with a broad base with dense epidermolytic hyperkeratosis, intracellular vacuoles within

stratum spinosum and granulosum, keratinocytes within the granular layer with irregular, basophilic keratohyaline bodies and eosinophilic inclusions (Figure 1 and 12).

Acanthomatous variant exemplifies prominent epidermal acanthosis, hyperkeratosis with reticulated epithelial cells, granular cell foci with keratinocytes, cytoplasmic vacuolization of the spinous cell layer, coarse abundant, irregular, basophilic keratohyaline bodies and eosinophilic inclusions (Figure 2, 3, 5-7, 10).

Cup shaped variant where the lesions are crateriform with prominent epidermolytic hyperkeratosis. Granular cell layer is thick with indeterminate cellular boundaries and a concurrence of irregular keratohyaline granules (Figure 8,9).

Papillomatous variant exhibits several papillary projections composed of compact epidermolytic hyperkeratosis, intracellular clear spaces within stratum spinosum and granulosum, keratinocytes in the dense granular layer with irregular, basophilic keratohyaline bodies and eosinophilic inclusions (Figure 4, 11).

Isolated epidermolytic acanthosis can recapitulate the histology of bullous congenital ichthyosiform erythroderma (BCIE), a condition engendered by genetic mutation of keratin 1 and keratin 10.

Immune histochemical analysis demonstrates a minimalistic immune staining of cytokeratins (CK1 and CK10) which can be contingent to the histological analogy of epidermolytic acanthoma to bullous congenital ichthyosiform erythroderma [2,4].

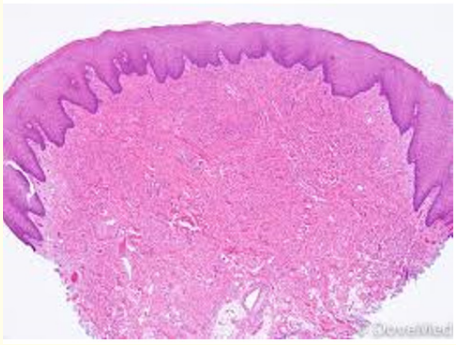

Figure 1: *Orthokeratosis, hyperkeratosis, papillomatosis and acanthosis in epidermolytic acanthoma [11].*

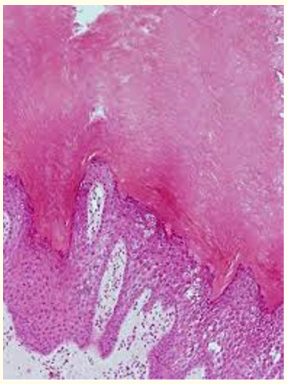

Figure 2: *Hyperkeratosis, papillomatosis, hypergranulosis cytoplasmic vacuolization in epidermolytic acanthoma [12].*

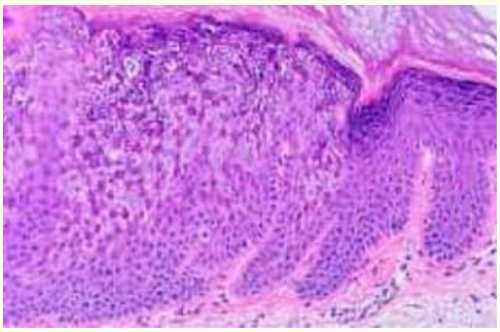

Figure 3: *Hypergranulosis, coarse keratohyaline granules, eosinophilic aggregates and papillomatosis in epidermolytic acanthoma [13].*

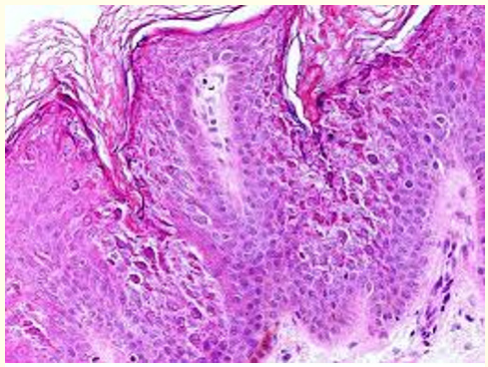

Figure 4: *Eosinophilic congregation, basophilic keratohyaline granules, hypergranulosis and hyperkeratosis in epidermolyticacanthoma [14].*

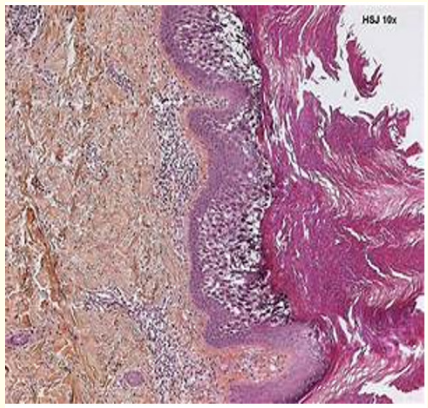

Figure 5: *Intense hyperkeratosis, cytoplasmic vacuolization in the upper spinous layer and papillomatosis in epidermolytic acanthoma [15].*

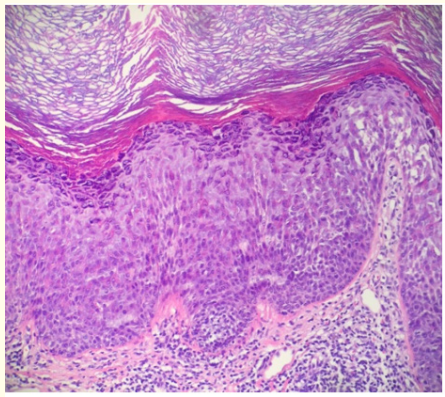

Figure 6: *Hypergranulosis, hyperkeratosis acanthosis and keratohyaline bodies in epidermolytic acanthoma [16].*

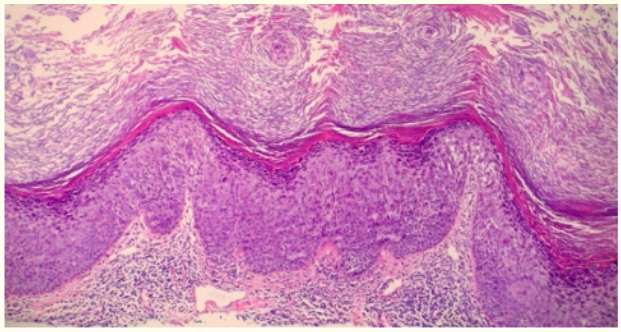

Figure 7: *Eosinophilic bodies and vacuolated cells in the granular and spinous layer with acanthosis and hyperkeratosis in epidermolytic acanthoma [16].*

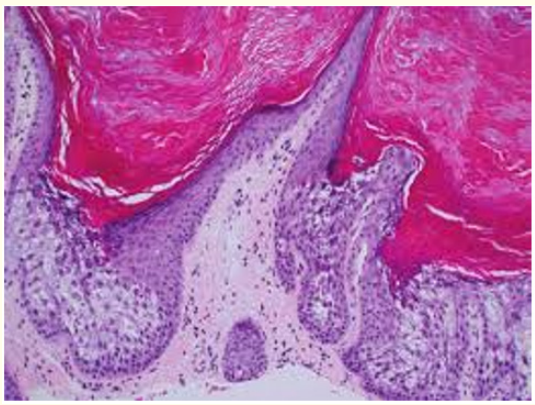

Figure 8: *Acanthosis, hyperkeratosis, papillomatosis and vacuolated cells in granular and spinous layers in epidermolytic acanthoma [17].*

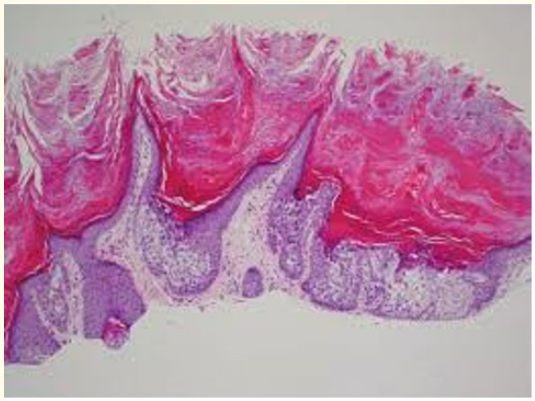

Figure 9: *Intense hyperkeratosis, acanthosis, hypergranulosis, cytoplasmic vacuolization and eosinophilic aggregates in spinous layer in epidermolytic acanthoma [17].*

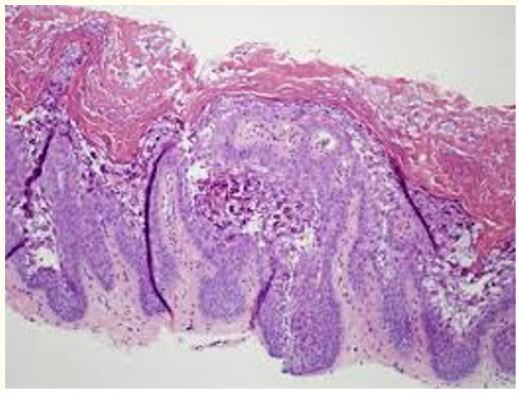

Figure 10: *Papillomatosis, typical eosinophilic aggregates and coarse, basophilic keratohyaline granules in the and granular zone with acanthosis and hyperkeratosis in epidermolytic acanthoma [18].*

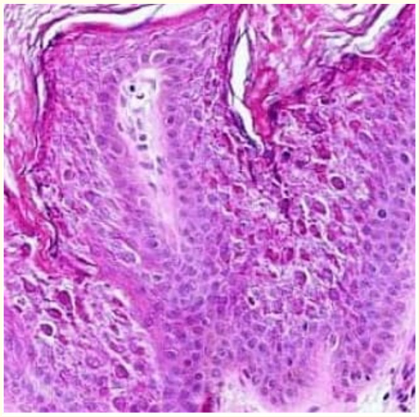

Figure 11: *Basophilic keratohyaline bodies, eosinophilic bodies and hypergranulosis with hyperkeratosis and acanthosis in epidermolytic acanthoma [19].*

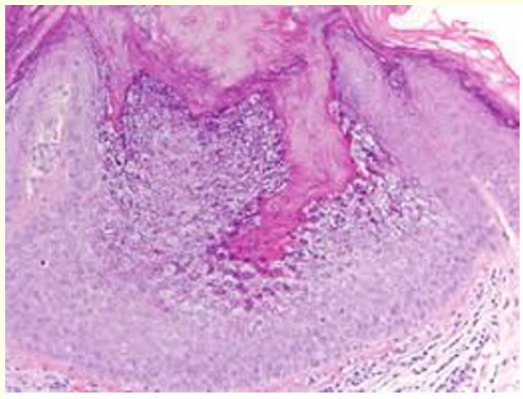

Figure 12: *Acanthosis, hyperkeratosis, hypergranulosis and basophilic keratinous aggregates in epidermolytic acanthoma [20].*

Electron microscopy

Ultra-structural examination is a cogent methodology to elucidate epidermolytic acanthoma. Tonofilaments display modifications and are precipitated within the cytoplasm along with the presence of intracellular vacuoles. Keratinocytes demonstrate premature cornifica-

Differential diagnosis

Segregation of epidermolytic acanthoma is necessitated from disorders such as condyloma acuminatum, intraepithelial neoplasm or psoriasis.

Clinical and histological demarcation betwixt verrucous tumefaction of epidermolytic acanthoma and condyloma acuminatum is problematic. Epidermolytic acanthoma emerges primarily in the scrota and labia majora of females. Epidermolytic acanthoma is described as a concurrence of clear spaces of different dimensions enveloping nuclei within the stratum spinosum and stratum granulosum. Additionally, amphophilic material is demonstrated along with indistinct cellular outlines, an intense granular zone with constituent keratohyaline bodies and foci of compact hyperkeratosis [8,9].

Condyloma acuminatum is preponderantly viral (human papilloma virus) by induction and appears within genitalia of young adults. Fleshy, exophytic lesions are elucidated and are clinically enlarged, as compared to the lesions of epidermolytic acanthoma. Condyloma acuminatum appears on the glans penis, root of penis, pubic and perianal region and the groin. Condyloma acuminatum recapitulates the morphology of epidermolytic acanthoma with the demonstration of acanthosis, papillomatosis, hyperkeratosis and coarse keratohyalin granules. Cytopathic infection with human papilloma virus (HPV) demonstrates a homogenous, clear halo surrounding the nucleus which is devoid of nuclear retraction. Acantholysis is not evident or depicts an eosinophilic cytoplasm and nuclear hyperchromasia, when elucidated [7,9].

Therapeutic options

Epidermolytic acanthoma usually does not mandate a therapeutic intervention on account of the indolent, benign configuration of miniature, asymptomatic lesions. Surgical extermination is cogent for cosmetic purposes.

Symptomatic individuals with itching, pain or irritation can opt for appropriate treatment.

Specific, efficacious therapies include surgical eradication of the plaques, cryotherapy and administration of topical immune modulators. Ablative therapy in the form of carbon dioxide laser can be suitably adopted. Therapeutic intervention usually displays varying outcomes. Tumefaction is generally devoid of reoccurrence [9,10].

Conclusion

Epidermolytic acanthosis is a neoplasm of obscure aetiology with a male predominance implicating children adults within fifth to seventh decade and appearing at sites such as genitalia (scrotum, vulva), trunk and extremities. Immune suppression, absence of viral (HPV) genome and non-reactive immune-staining for p16 are significant pathogenic mechanisms in the emergence of epidermolytic acanthoma. Compact epidermolytic hyperkeratosis, foci of reticulated, delicately stained epithelial cells with indistinct cellular boundaries, an intense granular zone with keratinocytes, spinous layer with cytoplasmic vacuolization, coarse abundant, irregular, basophilic keratohyaline bodies, eosinophilic inclusions and lack of epithelial dysplasia are characteristic morphological parameters. Epidermolytic acanthoma necessitates a demarcation from disorders such as condyloma acuminatum, intraepithelial malignancies and psoriasis. Efficacious therapies include surgical eradication of the plaques, cryotherapy, administration of topical immune modulators and ablation with carbon dioxide laser.

Bibliography

1. Shapiro L., *et al*. "Isolated epidermolytic acanthoma: A solitary tumour showing granular degeneration". *Archives of Dermatology* 101.2 (1970): 220-223.

2. Ackerman AB. "Histopathologic concept of epidermolytic hyperkeratosis". *Archives of Dermatology* 102.3 (1970): 253-259.

3. Yang JH., *et al*. "Isolated epidermolytic acanthoma in a renal transplant recipient". *Annals of Dermatology* 23.3 (2011): 415-416.

4. Dupont A., *et al*. "Epidermolytic acanthoma mimicking condyloma: a case report". *Dermatopathology* 6 (2019): 23-27.

5. Moulonguet I. "Multiple epidermolytic acanthomas of the genitalia". *Annales de Dermatologie et de Vénéréologie* 144.4 (2017): 295-300.

6. Lee TJ and Wu YH. "Multiple epidermolytic acanthoma mimicking condyloma: a retrospective study of 8 cases". *International Journal of Dermatology* 57.1 (2018): 28-33.

7. Fletcher JW and Ramamurthy A. "Presentation of epidermolytic acanthomas as multiple tan papules on the vulva". *Proceedings (Baylor University. Medical Center)* 29.2 (2016): 198-199.

8. Hijazi MM., *et al*. "Multiple localized epidermolytic acanthomas of the vulva associated with vulvar pruritus: a case report". *American Journal of Dermatopathology* 37.4 (2015): e49-e52.

9. Egozi-Reinman E., *et al*. "Epidermolytic acanthoma of the genitalia does not show mutation in KRT1 and KRT10". *American Journal of Dermatopathology* 38.2 (2016): 164-165.

10. Irwin S., *et al*. "Multiple epidermolytic acanthomas: rare vulval lesions which may be mistaken for viral warts". *International Journal of Gynecological Pathology* (2018).

11. Image 1 Courtesy: Dove med.

12. Image 2 Courtesy: Wikivisually.com.

13. Image 3 Courtesy: Rock café.

14. Image 4 Courtesy: Wordpress.

15. Image 5 Courtesy: Golfclub.info.

16. Image 6 and 7 Courtesy: Twitter.
17. Image 8 and 9 Courtesy: Semantic scholar.
18. Image 10 Courtesy: eScholarship.
19. Image 11 Courtesy: Dr Sarma Dermpath.
20. Image 12 Courtesy: Wiley online library.

Volume 2 Issue 6 August 2019