Transepidermal elimination of suture material in lip biopsy specimen

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Abstract
Transepidermal elimination (TE) is a well-known phenomenon by which dermal materials are expelled through an active epithelial-dermal connective tissue interaction. It has been associated with many cutaneous disorders and described as a regular or sporadic occurrence in a variety of dermatologic conditions. TE as a means of expulsion by skin, either externally introduced or endogenously generated foreign material, is well recognized but rarely appreciated phenomenon. Hence, here we are presenting a case of TE of suture material from the labial surface of the lower lip in a patient who was previously operated for mucocele a year back and reported with the impression of the recurrent lesion.

Keywords: Lip, suture material, transepidermal elimination

INTRODUCTION
Transepidermal elimination (TE) is a purposeful, well known, reactive phenomenon by which foreign or altered dermal constituents are removed via the epidermis. Altered dermal constituents may be due to the consequences of inflammatory, metabolic, or neoplastic disorders.[1,2] Mehregan first coined the term TE in 1970 and proposed the concept of it in a variety of dermatologic conditions.[3,4] TE of suture material shows the natural cutaneous waste disposal mechanism of foreign material.

CASE DETAILS
A 35-year-old male presented to our hospital with slow growing, non-tender, soft lesion on the labial surface of the lower lip with a smooth surface for the last 4 months. He had a history of mucocele at the same site which was operated a year back. On intraoral examination, a solitary well defined, oval-shaped swelling measuring about 1.0 × 0.9 cm in size on the labial surface of the lower right side of the lip with normal overlying mucosa and without any lymphadenopathy. Differential diagnosis includes recurrent mucous extravasation phenomenon, mucous retention cyst, lipoma, and salivary gland tumors.

The lesion was completely excised under local anesthesia with the clinical impression of recurrent mucocele and primary closure done. Grossly the lesion has an intact epithelial surface and measured 1.0 cm in greatest dimension. Microscopically lesion shows hyperplastic...
proliferating epithelium with acanthosis, extending into the lamina propria and surrounding the abundant foreign body suture material. Suture material appears as multiple circular and oval bodies (depending on the cut section) and shows birefringence under the polarizer [Figures 1-3]. Underlying connective tissue was richly vascularized along with multiple neutrophils and macrophages. The lesion was diagnosed as TE of suture material.

**Definition**

TE is well recognized histopathologic phenomenon and allows the disposal of foreign material by epithelium without gross disturbance in epidermal integrity. It is characterized by pseudoepitheliomatous hyperplasia of epidermis and/or follicular epithelium and formation of multiple transepithelial perforating channels, facilitating the extrusion of the altered dermal material or foreign substances to the exterior.[1-4]

**Pathogenesis and concept of TE**

Mehregan described three different types of epidermal reaction depending on the quality, quantity, and particle size of the foreign matter.[1,2,5]

Type 1 includes the trapping of nonmotile cells or inert particles such as erythrocytes and hemosiderin, respectively, which elicit minimal or no dermal reaction. These particles can be trapped between epithelial cells and migrate upward to the surface and lead to desquamation.

Type 2 reaction involves motile cells such as Treponema pallidum and leukocytes which actively migrate into the epidermal spaces to be carried upward with physiological desquamation process.

Type 1 and type 2, being relatively passive processes with the absence of specific dermoeipidermal reaction, have collectively been known as “transmigration.”

Type 3 includes active epidermal-dermal interaction which is a unidirectional elimination process whereby dermal altered material and foreign components (e.g., calcium, collagen, elastin) are actively eliminated through the epidermis. Mehregan formulates this concept and coined the term as “TE.”

Nature and location of dermal stimulus are the two main prerequisites for TE. The stimulus should not be very strong otherwise it elicits a strong inflammatory reaction which leads to necrosis and purulent discharge which does not represent transepithelial elimination. Hence, the stimulus should be irritant enough to induce reactive hyperplasia of the epidermis and inflammation without any major structural alteration. The stimulus should be located within a specific dermal–epidermal interaction zone that is above the level of the hair papillae in the dermis. Close proximity to the epithelium is extremely required because the deeper location of the stimulus will not result in TE.[1,2]

Although pathogenesis and molecular mechanism of TE are not fully understood. The initial event starts with the binding of foreign or altered dermal constituents to an unidentified receptor followed by dermal production of some chemical mediators leading to hyperproliferation of the epidermis. The formation of transepidermal channels...
takes place and foreign substances get surrounded and phagocytosed by epidermal cells then and are subsequently moved upward to the surface. Recently, in the pathogenesis of acquired reactive perforating collagenosis, the receptor for advanced glycation end products has been suggested to play a role by modulating the collagen–keratinocyte interaction and keratinocyte migration.\[1,3\]

Disorders associated with TE

TE has been characteristically presented as the hallmark of primary perforating disorders, namely, elastosis perforans serpiginosa, reactive perforating collagenosis, perforating folliculitis, and acquired perforating dermatosis.\[1,6\] TE is also described in many infective and noninfective conditions and may present as perforating folliculitis.\[1,7,8\] TE of gold metals has been reported after the procedure of face-lifting acupuncture.\[9\]

The materials undergoing elimination may be foreign (calcium, silica, and topical steroids), infective (chromomycosis, cryptococcosis, aspergillosis, and leishmaniasis), altered connective tissue components (sarcoidosis, granuloma annulare, necrobiosis lipoidica, rheumatoid nodule, pseudoxanthoma elasticum, and healing wounds), inflammatory cells and erythrocytes (black heel hemorrhage), neoplastic cells (melanoma, Paget disease, and mycosis fungoides), products of keratinization or extracellular substances (amyloid protein, uric acid, mucin, and sialomucin).\[3\]

Reports have been published of transepithelial elimination of retained suture material via hair follicle in a woman who was operated for basal cell carcinoma on tip of the nose.\[4\] TE has also been described as a cutaneous waste disposal mechanism for foreign material, like suture, talcum powder, and Monsel’s solution (ferric subsulfate).\[5\] The concept of TE was supported and recorded in the animal model, in which charcoal particles were injected into the skin of guinea pigs.\[4,5,10\]

Here, the patient was operated for mucocele on the lower lip 1 year back and developed the swelling at the same site, mitigating as recurrent mucocele, hence re-excised and sent for histopathology which showed TE of suture material.

CONCLUSION

Transepithelial elimination is common, unreported, and well-accepted histological phenomenon of elimination of debris from the dermis via the epidermis or hair follicle which signifies the skin’s remarkable self-healing potential. This entity should always be kept in mind while dealing with lesions previously operated and mimicking recurrence or missed malignancy. Thus, this case discussion elaborates on the histomorphological appearance of TE of suture material, which will help pathologists in accurate diagnosis and hence surgical interventions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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