



**Short Communication**

**Eosinophilic imprints**

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**Abstract**

Eosinophilic bodies are frequently used as a diagnostic aid in determining the underlying disease. The purpose of this article is to collate various eosinophilic entities seen histopathologically in various disorders.

**Keywords:** Eosinophilic bodies, Civatte bodies, Toto bodies, Rushton bodies, Verocay bodies, Ghost cells, Henderson Patterson bodies

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## INTRODUCTION

Cells can get modified in some diseases or pathological circumstances, and these transformed cells can become pathognomonic for those diseases. Eosinophilic-like material is pathognomonic of a few diseases in this regard. These bodies are intracellular or extracellular abnormalities that are associated with various illnesses. These structures can be found within the cell nucleus, the cytoplasm, or both, and they have distinct staining qualities. These are unusual morphological changes in a tissue that result in a very distinctive pattern.<sup>1</sup> This article gives information about different eosinophilic bodies and eosinophilic like material seen in various diseases.

### Types of Eosinophilic Bodies

Different types of eosinophilic bodies are

1. Civatte bodies
2. Toto bodies
3. Rushton bodies
4. Verocay bodies
5. Ghost cells
6. Henderson Patterson bodies

#### 1. Civatte bodies

Civatte bodies appear as spherical, homogeneous, eosinophilic masses on routine haematoxylin and eosin stain in the deeper regions of the epidermis/epithelium and more commonly in the dermis/connective tissue.<sup>2</sup> They are also termed as Cytoid, Hyaline, Colloid, or Keratin Bodies. The proposed causative mechanisms are apoptosis of keratinocytes in the epidermis and papillary dermis and the breakdown of the thicker basement membrane of cells in the papillary dermis by any physiologic/pathologic process. These bodies ultrastructurally are made up of whorls or distinct filaments (60-80) that can be coupled to desmosomes. They lose their nuclei due to condensation or widespread disintegration, and the cytoplasm may include vacuoles.<sup>3</sup> Civatte bodies are seen in Lichen planus, Lupus erythematosus, Graft versus host disease, drug reactions, Erythema multiformae, Bullous Pemphigoid and Epidermolytic hyperkeratosis.

#### 2. Toto bodies

These bodies are described by Toto as eosinophilic bodies showing homogeneous, eosinophilic pools of material in the superficial spinous layer of the surface epithelium. They are also known as keratin pooling or keratin like material<sup>4</sup>. Individual cells appear to have been replaced by mucopolysaccharide keratin dystrophy in epithelial cells. <sup>1</sup> these bodies are seen in inflammatory lesions like Epulis fissuratum, irritation fibromas, pyogenic granuloma, peripheral giant cell granuloma, and inflammatory hyperplastic gingivitis and these cells stain positive for periodic acid-Schiff (PAS), alcian blue and other metachromatic stains.<sup>4</sup>

#### 3. Rushton bodies

In Haematoxylin and Eosin-stained sections, Hyaline bodies of Rushton appear as eosinophilic bodies that come in a variety of shapes, including linear, straight, curved, hairpin shaped, circular, and polycyclic. These types of bodies are seen in periapical cyst. They frequently have a granular core and are occasionally

concentrically lamellated. Rushton bodies, also known as hyaline bodies, are almost usually present within the epithelial lining and only rarely within the fibrous capsule. Lamellated and homogenous forms are revealed through ultrastructural examination. The electron dense and electron lucent layers of the lamellar type alternate, with the outermost layer always being electron dense. The granular type is usually made up of amorphous material that contains red blood cell fragments. Some hyaline bodies are granular on the outside and lamellar on the inside. Both forms of epithelia have a considerable number of hemidesmosomes on their surfaces, but no basal lamina.<sup>1</sup>

#### 4. Verocay bodies

José Juan Verocay, a Uruguayan neuropathologist, was the first to describe Verocay bodies, which are small hyaline structures. It is pathognomonic of schwannoma, a benign nerve sheath tumor and shows compactly arranged spindle shaped cells with a palisading pattern in H and E stained section.<sup>1</sup> A typical Verocay body consists of a stacked arrangement of two rows of elongated palisading nuclei that alternates with acellular zones made up of cytoplasmic processes of the Schwann cells. The pathogenesis of the formation of this structure is explained by the overexpression of laminins in the cells that make up the Verocay body.<sup>5</sup> Laminins are large glycoproteins found in the basement membranes of a variety of cells, including Schwann cells, that stimulate cell-cell adhesion.

#### 5. Ghost cells

Ghost cells are altered epithelial cells that exhibit loss of nuclei with preservation of basic cellular outline. These epithelial cells are swollen, pale, eosinophilic cells that has shadowy appearance in haematoxylin-eosin-stained sections.<sup>6</sup> Ghost cells are evident in various lesions like calcifying odontogenic cyst, dentinogenic ghost cell tumour, Dentinogenic Ghost Cell Carcinomas, Ghost Cell Odontogenic Carcinoma and Odontomas. Various stains such as Goldner stain, Van Gieson, Masson's trichrome, Mallory, and Rhodamine B, may be effective in differentiating ghost cells and other acidophilic aggregates. The Phloxin-Tartrazine stain can be used to distinguish ghost cells from dentinoid patches that appear to be similar.<sup>7</sup>

#### 6. Henderson Patterson bodies

Molluscum contagiosum contains these bodies. They are huge, ellipsoid, homogeneous intracytoplasmic inclusions found in the stratum spinosum and stratum corneum of the diseased epithelium. They're made up of nuclear and cytoplasmic aggregates, most of which are proteins, and they're where viruses multiply.<sup>1</sup> Henderson and Paterson described intracytoplasmic inclusion bodies in 1841. The molluscum bodies have membrane bound sacs that carry virus, according to ultrastructural research. The virus forms these inclusion bodies, which are around 35 nm in diameter, within the cytoplasm of the cell.<sup>8</sup> The virion begins as a tiny particle in the cytoplasm of suprabasal layer cells and grows in size as it progresses through the spinous to granular layers. These inclusion bodies compress the nucleus to the periphery of infected cells in the granular layer. The molluscum bodies' staining reaction shifts from eosinophilic to basophilic near the granular cell layer.<sup>8</sup>

### Conclusion

Eosinophilic bodies are likely a combination of glycoprotein and mucopolysaccharides from normal intercellular material and plasma fluid exudates that collect in the dilated intercellular gaps of superficial degenerating cells. In the field of oral pathology, eosinophilic bodies play a crucial role in disease diagnosis. These characteristics are generally indicative of the disease's aetiology, and some of them are pathognomonic.

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