Resident's Page

Named bodies in dermatology

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INTRODUCTION

This article cites, briefly and completely, the named bodies in dermatology. It is not restricted to bodies seen only histopathologically, rather an attempt has been made to include bodies found in the skin, blood smears, fundal examination, lymph nodes, culture media and bone marrow smears provided they pertain to disease conditions of our subject of interest [Figures 1-4]. At the end of the day, the article will stand useful to not only the dermatologist / pathologist but more so to the young budding dermatology/ pathology postgraduates who are often quizzed on this part of dermatology. The article has been broadly divided into the following categories:

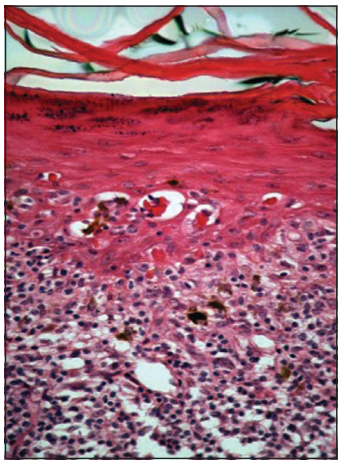

Figure 1: Lichen planus: colloid bodies in the epidermis (H and E, x400)

GENERAL CATEGORY [TABLE 1]

- Normal cutaneous anatomy: Glomus bodies, lamellar bodies, Weibel-palade bodies
- Hair disorders: Arao-Perkin bodies, papillary mesenchymal bodies
- Granulomatous disorders: Asteroid bodies, Conchoidal /Schaumann bodies
- Metabolic and storage disorders: Banana bodies, Caterpillar bodies, Farber's bodies, Lafora bodies, Zebra bodies, Alder Reilly bodies
- Tumors: Dutcher bodies, Psammoma bodies, Pustulo-ovoid bodies of Milian, Verocay bodies
- Papulosquamous disorders: Civatte bodies, Corp ronds and grains
- Histiocytic disorders: Comma shaped bodies
- Benign pigmented lesions: Kamino bodies
- Collagen vascular disorders: Cytoid bodies, LE bodies
- Age related change: Pertinax bodies
- Drug induced: Heinz bodies

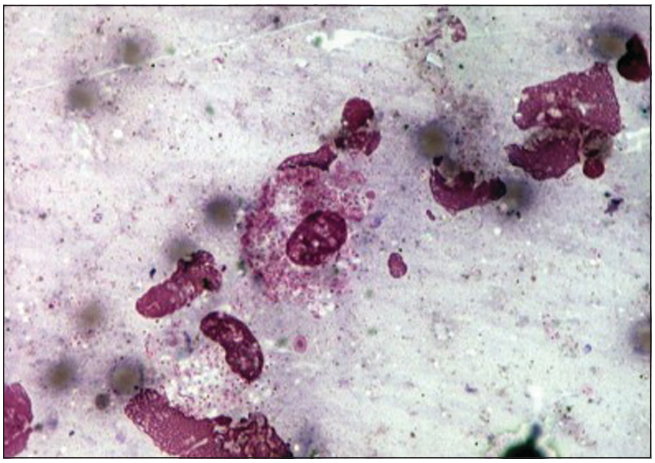

Figure 2: Leishmaniasis: numerous organisms seen intracellularly (macrophage) and extracellularly (Giemsa X1000 i.e., under oil immersion)

INFECTIOUS DISORDERS [TABLE 2]

- Bacterial: Dohle bodies, Mallory bodies, Michaelis-Gutmann bodies, Russell bodies, Donovan bodies,

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DOI: 10.4103/0378-6323.60551 ·

How to cite this article: Sequeira FF, Kumar A, Kini U, Jayanthi. Named bodies in dermatology. Indian J Dermatol Venereol Leprol 2010;76:207-13.

Received: April, 2009. **Accepted:** October, 2009. **Source of Support:** Nil. **Conflict of Interest:** None declared.

Table 1: Named bodies under general category

Name	Description/ location/size	Light/electron microscopy	Stains used	Observed in/ significance
Glomus bodies	Specialized arterio-venous shunts that without the interposition of capillaries connect an arteriole with a venule. Most abundant in the pads and nail beds of the fingers and toes.[1]	EM	-	Concerned with temperature regulation
Lamellar bodies/ Odland bodies/ Cementosomes	Are round-oval granules that possess a highly ordered lamellar internal structure and contain bipolar phospholipids, glycoproteins and acid phosphatases. Measure 300 nanometer in diameter and are located in the cytoplasm of cells of the upper spinous and granular cell layer[2]	EM	-	Play an important role in barrier function and intercellular cohesion within the stratum corneum Abnormal formation and secretion of lamellar bodies seen in harlequin ichthyosis
Weibel-palade bodies	An electron dense cytoplasmic organelle measuring approximately 0.1 micrometer in diameter and upto 3 micrometer in length. It is composed of a small number of tubules, approximately 15 nanometer thick and arranged in the long axis of the rod. Endothelium specific inclusions.[3]	EM	-	They contain Von Willebrand factor, P-selectin and CD63
Arao-perkin bodies	Begin as a small cluster of elastic fibers in the neck of the dermal papilla.These clump in the catagen and remain situated at the lowest point of origin of the follicular stellae. With progressive shortening of the anagen in AGA, multiple elastic clumps may be found in the stellae, like rungs of a ladder.[4]	LM (x200,x400)	H and E Elatin stains e.g. Acid orcein but not Verhoeff [5]	Seen in androgenetic alopecia
Papillary mesenchymal bodies	Constitute clusters of fibroblasts adjacent to epithelial buds as in the germinative portion of the normal hair papilla.[6]	LM (x200,x400)	H and E	Observed in trichoepitheliomas.
Asteroid bodies	Are star shaped eosinophilic structures with a centre that is brown red and radiating blue spikes seen within histiocytes or multinucleated giant cells. Are between 10-15 micrometer in size.[7-10]	LM (x200,x400)	H and E	Sarcoidosis, sporotrichosis and actinic granuloma. These bodies contain collagen showing the typical 64-70nm periodicity. It seems likely that this collagen is trapped between epitheliod cells during the stage of giant cell formation
Conchoidal / Schaumann bodies	Are basophilic concentric lamellar structures 100 micrometer in size, that show central birefringent crystals.[11]	LM (x200,x400)	H and E	Seen in sarcoidosis and other granulomatous disorders like tuberculosis etc. Composed of lipomucoglycoproteins impregnated with calcium and iron.
Banana bodies	Are cresentic shaped bodies within Schwann cells.[12]	EM	-	Seen in disseminated lipogranulomatosis.
Caterpillar bodies	Are epidermal eosinophilic bodies that are elongated and sometimes segmented, forming the roof of the blister in porphyria cutanea tarda. Ultrastructurally they have three components: 1. Cellular organelles, including mitochondria, melanosomes and desmosomes 2. Colloid that may be located intracellularly or extracellularly 3. Electron dense material thought to be of basement membrane origin.[13,14]	LM (x200,x400)	H and E PAS positive Diastase resistant	Seen in porphyria cutanea tarda.

Table 1: Contd...

Name	Description/ location/size	Light/electron microscopy	Stains used	Observed in/ significance
Farber's bodies	Are curvilinear bodies within the cytoplasm of fibroblasts and occasionally of endothelial cells. They are also found within phagosomes of histiocytes at various stages of degradation.[12]	EM	-	Farber's disease
Lafora bodies/poly-glucosan bodies	These bodies are seen in the excretory ducts of eccrine and apocrine sweat ducts of clinically normal skin.[15]	LM (x200, x400)	H and E PAS positive Diastase resistant	Seen in lafora disease, a familial degenerative disorder consisting of a triad of dementia, myoclonus and seizures. Cutaneous lesions are rarely present.
Zebra bodies	Are vacuoles with transverse membranes within endothelial cells.[16]	EM	-	Seen in Farber's disease and various other ganglioside storage disorders.
Alder Reilly bodies	Deeply basophilic granules that are sometimes seen in the neutrophils of patients with disorders of mucopolysaccharide degradation. These granules may also be present in lymphocytes and monocytes. They appear to be lysosomes that stain abnormally due to their content of incompletely degraded mucopolysaccharides.[17,18]	(x1000) under oil immersion	Lilac with wright-giemsa and metachr-omatic with toluidine blue.	Mucopolysaccharide storage disorders e.g.: Hunter's Syndrome, Hurler's Syndrome.
Dutcher bodies	Eosinophilic intranuclear pseudoinclusions within plasma cells, formed by a cytoplasmic invagination into the nucleus. They are smooth, membrane-bound, and surrounded by clumped chromatin.[19,20]	(x1000) under oil immersion	H and E PAS positive Diastase resistant	Associated with low-grade malignant lymphomas, particularly lymphoplasmacytic lymphoma, mucosa-associated lymphoid tissue (MALT) type lymphoma, myeloma or waldenstrom macroglobulinemia. The pseudoinclusions are thought to result from the accumulation of immunoglobulin in the perinuclear cisterna.
Psammoma bodies	Concentrically laminated, hyalinized or calcified basophilic structures.[21]	LM (X40)	H and E	Cutaneous meningioma
Pustulo-ovoid bodies of Milian	Large eosinophilic intracytoplasmic granules surrounded by a clear halo.[22]	LM (X400)	PAS positive Diastase resistant	Are seen in granular cell tumor of the tongue in 40% of cases, but anywhere on the skin in 60%.
Verocay bodies	Two neighbouring palisades, the intervening cytoplasm of schwann cells and associated reticular fibers all in combination constitute a verocay body.[23]	LM (X40)	H and E	Seen in schwannomas.
Civatte/Colloid/ Cytoid/Hyaline/ Sabaroud bodies	Necrotic keratinocytes averaging 20micrometer in diameter and possessing a homogeneous eosinophilic appearance. They are located in the lower epidermis and especially in the papillary dermis.[24]	LM (X40)	H and E PAS positive Diastase resistant	Seen in graft versus host disease, lichen nitidus, lichen planus, lupus erythematosus, drug reactions and in inflammed keratoses such as lichenoid actinic keratoses and lichen planus like keratoses. They may be seen even in normal skin.
Corp ronds and grains	Dyskeratotic cells found as solitary or sometimes small groups of separated cells in the upper malpighian layer and stratum corneum. They have a small pyknotic nucleus, a clear perinuclear halo and brightly eosinoiphilic cytoplasm. Grains are small cells with elongated nuclei and scanty cytoplasm in the upper layers of the epidermis.[25]	LM (x40)	H and E	Seen in Darier's disease.

Table 1: Contd...

Name	Description/ location/size	Light/electron microscopy	Stains used	Observed in/ significance
Comma shaped bodies	Seen within the histiocytes. These bodies are formed by two electron-dense membranes of approximately 6 nm, separated by a light space of about 8 nm.[26-28]	EM	-	Observed in juvenile xanthogranulomas, benign cephalic histiocytosis and sinus histiocytosis with massive lymphadenopathy.
Kamino bodies	Eosinophilic globules seen in the basal layer above the tips of the dermal papillae.[29,30]	LM (X400)	H and E PAS positive	Found in spitz nevi, melanomas and ordinary nevi.
Cytoid bodies	Essentially localized areas of swelling in the inner layers of the retina, predominantly involving the nerve fibre layer. They are usually confined to the posterior fundus. They contain giant globular bodies with round or oval eosinophilic inclusions resembling degenerate nuclei.[31-33]	Seen ophthalmoscopically	-	Conditions which show fundal cytoid bodies include systemic lupus erythematosus, dermatomyositis, polyarteritis nodosa, scleroderma and giant cell arteritis.
LE bodies	Following the nuclear penetration of the traumatized leucocytes by the LE-cell factor, the altered nucleus detaches itself from the cytoplasm and appears as a free extracellular LE body. It appears as a homogenous, pale blue to deep purplish material pushing the nucleus of the phagocyte to one side of the cell.[34]	LM (X400) (X1000) under oil immersion	Wright's Giemsa	Seen in SLE.
Pertinax bodies	Acidophilic masses which represent remanants of keratinocyte nuclei.[35]	LM (X 200)	H and E	A change seen in senile nails.
Heinz bodies	Bodies are blue inclusions within red blood cells composed of denatured hemoglobin.[36] They are formed by damage to the hemoglobin component molecules, usually through oxidations, which causes the damaged molecules to precipitate and damage the cell membrane. The oxidative hemolytic anemias arise from formation of excess oxidising products or from breakdown of protective mechanisms from oxidants.[37] They appear as single or multiple inclusions of 2 micrometer in diameter or less and often appear attached to the membrane.	LM (X1000) under oil immersion	Supravital stains e.g. Crystal violet and Brillant cresyl blue etc.	e.g. drug induced: dapsone, chloroquine and methylene blue.[38]

Table 2 Named bodies under infectious disorders

Dohle Bodies	Small, one micron pale irregular, basophilic, rounded-oval or rod shaped bodies chiefly in the periphery of the polymorphonuclear leucocytes.[39]	LM (x1000) under oil immersion	Wright stain	Are found in most cases of scarlet fever during the stage of rash. Although supporting the diagnosis when found in the acute stage and throwing some doubt on scarlet fever if absent at this stage, they are not specific.
Mallory bodies	Made up of a delicate reticulum which stains light blue and the surrounding protoplasm pink. They are located intranuclearly within epidermal cells or lay within the lymph spaces.[40]	LM (x400)	Giemsa	Are found in both measles and scarlet fever
Michaelis-Gutmann bodies	Ovoid-round basophilic inclusions that vary in size from 5-15micrometer and are seen in granular Von Hansemann histiocytes. These bodies are either homogenous or have a target appearance by showing concentric laminations.[41]	LM (x200,400)	H and E PAS + Diastase resistant Alcian blue+ Von kossa + Perls' stain +	Seen in malakoplakia.
Russell bodies	Homogeneous, elliptical, intracytoplasmic eosinophilic inclusions seen within plasma cells. Are 20-40 micrometer in diameter.[42]	LM (X40)	H and E PAS +	Observed in rhinoscleroma. Represent retained globules of immunoglobulin.
Cigar bodies	At 37°C, Sporothrix schenckii the causative agent of sporotrichosis may be present in the tissue as a yeast- like form 2-8 micrometer in diameter or as elongated cigar bodies' 4-10 micrometer long.[43]	LM (X400)	Grams stain	Sporotrichosis
Medlar bodies, Sclerotic bodies, Muriform cells, Copper pennies	Dark brown, thick walled, ovoid or spheric spores varying in size from 6-12 micrometer,lying singly, in clusters or chains within histiocytes in microabcesses as well as free within the tissue.[44]	LM (X400)	H and E	Seen in chromomycosis. They are thought to be an intermediate vegetative form arrested between yeast and hyphal morphology.
Leishman Donovan bodies	The cytoplasm of the histiocytes is filled with numerous dull blue-grey round to oval bodies that exhibit a round basophilic nucleus and a rod shaped paranuclear kinetoplast. Measure about 2-4micrometer in diameter.[45]	LM (X400)	Giemsa	Seen in leishmaniasis. Represent amastigotes.
Guarnieri bodies/ Paschen Bodies	Intracytoplasmic eosinophilic aggregation of virus particles.[46]	LM (X400)	H and E	Variola, vaccinia, human cowpox and parapox
Henderson-Patterson bodies	Ovoid, eosinophilic structures in the lower cells of the stratum malpighii. They increase in size as the infected cells move towards the surface. In the upper layers of the epidermis, the molluscum body compresses the nucleus of the cell so that it appears as a thin crescent at the periphery of the cell. At the granular layer, the staining reaction of the molluscum body changes from eosinophilic to basophilic.[47]	LM (X40)	H and E	Molluscum contagiosum
Cowdry A /Lipschütz inclusions	Intranuclear eosinophilic inclusions surrounded by a clear halo. They measure 3-8 micrometer in diameter. [48]	LM (x1000) under oil immersion	H and E	In herpes simplex and varicella zoster lesions.

EM- Electron microscopy, LM- Light microscopy, H and E - Hemotoxylin and Eosin

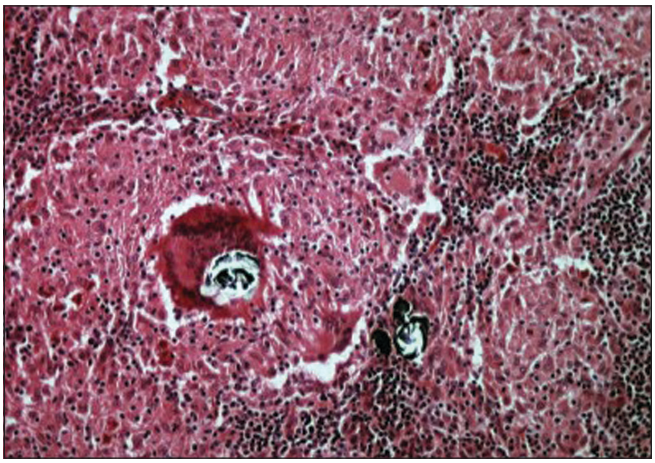

Figure 3: Sarcoidosis: basophilic lamellar structures seen in the cytoplasm of giant cells-Schaumann bodies (H and E, x200)

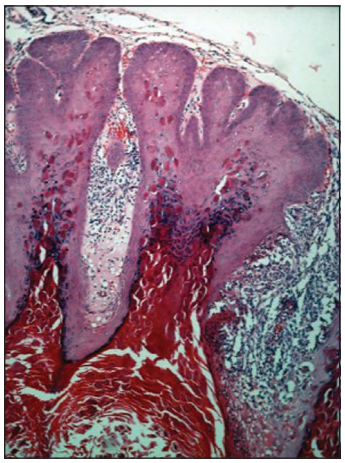

Figure 4: Molluscum contagiosum: eosinophilic cytoplasmic viral inclusions seen in the lower cells of the stratum malpighii-Henderson Patterson bodies (H and E, x200)

Gamna favre bodies

- Fungal: Cigar bodies, Medlar bodies
- Protozoal: Leishman Donovan bodies
- Viral: Poxviridae: Guarnieri bodies, Henderson-Patterson bodies:
- Herpes group: Cowdry A.

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