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Editorial

Metarteriole and Superfluity-Bacillary Angiomatosis Lymph Node

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Bacillary angiomatosis associated lymphadenopathy is engendered by *Bartonella henselae*, a bacterium inducing cat scratch disease. Few lesions may be engendered by *Bartonella quintana*. Generally, the conditions arises within immunosuppressed subjects or individuals with human immune deficiency virus (HIV) infection. Lesion may appear as a neoplastic process although the bacterial infection induces a reactive inflammatory response.

Reservoir for offending bacteria are domestic cats which transmit infection to humans or cat fleas wherein the infection is transferred to various cats. Infected individuals depict multiple, reddish to violet cutaneous lesions simulating lesions of Kaposi's sarcoma. Lesions may occur within regional lymph nodes and spleen.

Cats are natural reservoir of *Bartonella henselae* wherein cats expound episodes of asymptomatic bacteraemia and bacteria appear impregnated within erythrocytes. Subsequently, cat fleas or *Ctenocephalides felis* transmit *Bartonella henselae* or *Bartonella quintana* to various cats [1,2].

Subsequently, transmission of organisms into humans by ticks or cats occurs with scratching. Besides, the body louse *Pediculus humanus* transmits *Bartonella quintana* into humans, especially within the homeless, impoverished or low socio-economic group populations [1,2].

Bartonella henselae organism may be isolated from individuals with cat scratch disease and lesions of bacillary angiomatosis. Inoculation of *Bartonella* species via blood-ingesting arthropods or cutaneous penetration following exposure to cats may ensue [1,2].

Thereafter, gram negative bacilli adhere to diverse host cells as erythrocytes, monocytes, macrophages or dendritic cells. Endothelial cells are frequently permeated with *Bartonella quintana*.

The host-specific *Bartonella* spp ingresses host cells wherein complex interactions between bacterial and host cell proteins confined to cellular surface may ensue [1,2].

Bacterial adhesion onto host cell membrane ensures uptake of aggregates of *Bartonella* spp within a vacuole of host cell. Secondly, bacteria accumulate upon host cell surface and engender self-phagocytosis with appearance of phagosome

wherein bacteria are exposed to environment resisting enzymes engendered due to intracellular oxidative stress and consequently secrete heat shock proteins [2,3].

Thirdly, specific mechanism of bacterial ingress into erythrocytes is assisted by secretion of protein 'deformin'. Deformin induces bacterial invagination within erythrocyte membrane with specific routes of bacterial entry, adherence to cell surface and consequent reorganization of cellular cytoskeleton [2,3].

Bartonella spp releases factors which activates endothelial cells and configures angiopoietin-2 with epidermal production of vascular endothelial growth factor (VEGF) [2,3].

BadA protein confined to cellular surface of *Bartonella henselae* ensures bacterial adhesion onto endothelial cells and fibronectin. Besides, BadA protein augments angiogenesis in infections arising due to *Bartonella henselae*. Also, BadA protein stimulates angiogenesis via inducible hypoxia factor-1 (IHF-1) [2,3].

Enunciation of extraneous membrane proteins (Vomp) induces and augments vascular growth in *Bartonella quintana* infections. Bacterial ingress into erythrocytes assists circumvention of host's adaptive and innate immune response [2,3].

CD4+ T helper cells generate interferon gamma and tumour necrosis factor (TNF) alpha, cytokines which eliminate the bacteria. *Bartonella* spp can attenuate host immune response with consequent emergence of chronic, asymptomatic carrier state, especially within homeless subjects [2,3].

Upon microscopy, focal effacement of lymph node architecture is observed. Intra-nodal parenchyma depicts clusters of multiple, coalescing, miniature vascular articulations layered by epithelioid endothelial cells impregnated with pale cytoplasm. Foci of nuclear atypia may be encountered. Interstitial tissue demonstrates abundant aggregates of eosinophilic or amphophilic, amorphous or granular substance pervaded with accumulated bacteria. Focal accumulation of neutrophils may be encountered [5,6].

Intestinal lymphoma staged with Lugano classification is denominated as:

- Limited stage disease comprised of
- Stage I: Tumour involving singular lymph node or group of adjacent lymph nodes.
- Stage IE: Tumour involving singular extra-lymphatic site in the absence of regional lymph node involvement.
- Stage II: Tumour involving ≥ 2 lymph node groups confined to one side of diaphragm.
- Stage IIE: Tumour demonstrating contiguous extra-lymphatic extension from a lymph node site along with or devoid of involvement of diverse lymph node regions on one side of diaphragm.
- Advanced stage disease is constituted of
- Stage III: Tumour incriminates regional lymph nodes on opposite sides of diaphragm or regional lymph nodes within supra-diaphragmatic area with involvement of spleen.
- Stage III(1): Tumour involves spleen or splenic, hilar, celiac or portal lymph nodes.
- Stage III(2): Tumour involves para-aortic, iliac, inguinal or mesenteric lymph nodes.

- Stage IV: Tumour exhibits diffuse or disseminated involvement of ≥ one extra-nodal organ or tissue along with or devoid of regional lymph node involvement [4].

The lymphoma may indicate absence of systemic symptoms designated as 'A' symptoms or presence of systemic symptoms as pyrexia, night sweats or unexplained weight loss > 10% body weight, denominated as 'B' symptoms [4].

Gram's stain depicts miniature, curved, motile, gram negative bacilli. The bacterial coalescence may be discerned with Warthin-Starry stain. Bacterial isolation with culture may be challenging [5].

Bacillary angiomatosis of the lymph node requires segregation from neoplasms as Kaposi's sarcoma, epithelioid haemangioma or epithelioid haemangioendothelioma [5].

Bacillary angiomatosis lymphadenitis may be appropriately discerned by polymerase chain reaction (PCR) [5,6].

Histological assessment of surgical tissue samples appears confirmatory for diagnosing bacillary angiomatosis [5,6].

Formalin fixed paraffin embedded sections stained with haematoxylin and eosin (H and E) stain delineate peliosis spaces layered with endothelial cells [5,6].

Warthin Starry stain expounds clumps of bacteria. However, morphological assessment appears inadequate for categorizing the bacterial species [6,7].

Serological assessment upon initial disease representation with subsequent fourfold augmentation of antibodies during convalescence appears to be a sensitive technique of disease discernment, in contrast to culture [6,7].

Immunofluorescent assays (IFA) aptly discerning immunoglobulin G (IgG) or enzyme immune assays (EIA) may be beneficially adopted for cogent detection of the disorder. Nevertheless, antigenic cross-reactivity between *Bartonella henselae* and *Bartonella quintana* or *Coxiella* and *Chlamydia* spp may be observed. Bacillary angiomatosis may be appropriately treated with erythromycin, various macrolides or doxycycline [6,7].

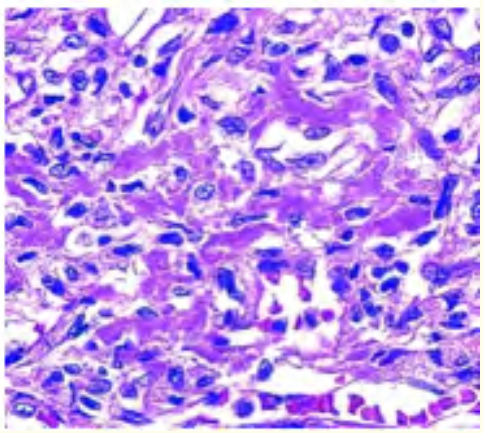

Figure 1: *Bacillary angiomatosis depicting vascular spaces lined by epithelioid endothelial cells and interstitial accumulation of amorphous, granular, eosinophilic substance. Lymph node architecture is effaced [8].*

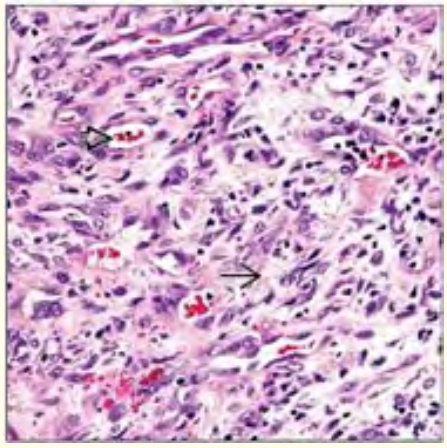

Figure 2: *Bacillary angiomatosis delineating vascular spaces layered by epithelioid endothelial cells and interstitial accumulation of amorphous, granular, eosinophilic substance with focal neutrophilic infiltrate. Lymph node architecture is effaced [9].*

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8. Image 1 Courtesy: Pathology outlines.
9. Image 2 Courtesy: Basic medical key.

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