Biofilm infections are the “stuff” of infections of the human heart valves (Bacterial endocarditis). In Bacterial Endocarditis, sessile biofilm communities attach themselves to the surface of the human Endothelial lined heart valves, and produce “vegetations” or “bumpy fibrin covered distortions” of the profiles of a healthy smooth surfaced delicate thin heart valve leaflet or cusp. Over time, the Biofilm communities which grow in size, are detectable by Radiologic imaging of the heart valves. The Heart valves are injury or in some cases completely destroyed by the biofilm communities of infecting microbes which have become attached to the valvular surface.

Over time, with persistence of the biofilm infection of the heart valve surface, bits of the Biofilm community break off from the parent biofilm unit and embolize (spread to distant Body sites). In addition, some biofilm infections of heart valves send out Showers “Seeding dissemination” of Planktonic bacteria into the blood stream. New sites of biofilm infection are thus established in the body of the host human with bacterial endocarditis.

Biofilm communities, when explanted from human tissues (i.e. Infected hip pros) will not grow on agar plates in a hospital laboratory. Costerton points out in his b reviewed manuscripts and book chapters that Biofilm Science does not pretend to purely planktonic principles.

Article (full text) reproduced below The Image within the article illustrates the microscopic profile of the Vegetation which was attached to the diseased heart valve. Attempts to visualize spiral (planktonic) Borrelia burgdorferi within the vegetation disclosed no spiral shaped microbes using a silver stain.
LYME ENDOCARDITIS


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Abstract

Lyme borreliosis is a common tick-borne disease with a wide variety of clinical manifestations. Cardiovascular involvement has been reported during both the acute phase (arteritis/myocarditis/block, pericarditis) and the chronic stage (endocarditis), but is rare (50%). Here we describe the first case of Borrelia burgdorferi endocarditis in a 61-year-old man living in an area endemic for ticks. The diagnosis was confirmed by detection of B. burgdorferi DNA in the mitral valve by specific reverse PCR. He was treated empirically with antibiotics for 6 weeks and remains well 13 months later.

Keywords: B. burgdorferi, Borrelia, endocarditis, lyme

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Lyme borreliosis (or Lyme disease) is the most commonly reported tick-borne disease in the northern hemisphere, notable in Europe and North America. The different species of the Borrelia burgdorferi sensu lato group are transmitted by infected ticks of the genus Ixodes. Whereas only one bacterial species, B. burgdorferi sensu stricto, is currently considered as pathogenic in North America, several pathogenic species are present in Europe (mainly B. burgdorferi sensu lato, B. afzelii and B. garinii), where they cause a wider variety of clinical manifestations [1]. Typically, following an acute, usually migratory, joint pain, the patients present with one or more severe manifestations such as arthritis and uveitis and neurological disorders [2]. Cardiac Lyme borreliosis is rare, representing only 0.3–4% of cases in Europe, and is generally associated with chronic neuroborreliosis (e.g., conduction defects, arrhythmias and, in some cases, myocarditis or pericarditis). Here we describe a documented case of Lyme endocarditis.

A 61-year-old man was admitted in March 2011 to Liege University Hospital, France, for mitral valve replacement. He was an ex-smoker, had a history of paroxysmal atrial fibrillation, and had mitral insufficiency due to mitral valve prolapse. Initial investigations showed atrial fibrillation and dyspnea, mitral regurgitation with no ejection fraction, an ejection fraction of 45%, and a dilated left atrium on cardiac ultrasound. During surgery the myocardial aspect of the mitral valve suggested endocarditis, with prolapse of the posterior valve and a 5-mm perforation of the anterior valve.

All trials cultures and serological tests commonly performed in the case of endocarditis (mandatory haematology, bacteriological per- tains. Microbiological pneumo- nia, endocarditis, aortic regurgitation, pleural, endocarditis) were all negative. He was treated empirically with intravenous amoxicillin and gentamicin for 2 weeks, followed by oral amoxicillin for 4 weeks. Microscopic analysis of the mitral valve showed endocarditis with honey macrophages suggestive of multiseg- mented microorganisms (Photo 1). Gram, PAS and Gomori stains were negative. Histological stain showed only

PHOTO 1: Microscopic view of the mitral valve showing sparse tissue deposits with numerous macrophages and Langhans' type multinucleated cells. (Photo 1.)

Clinical Microbiology and Infection (CMI) The authors declare no conflicts of interest.


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Authors' Contributions

N.H. carried out all tests; G.B. wrote the report; S.O.P., F.G. and C.H. carried out microbiological tests in BS and ML, and managed the patient; F.P. carried out microscopic analysis. B.J. and P.C.P. reviewed the report.

Conflict of Interest

Written consent to publish was obtained. The authors declare no conflicts of interest.

Transparency Declaration

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References

A pertinent microscopic observation within the silver stained heart valve vegetation using the Warthin-Starry silver stain was to observation of “scarce curved rods which had a morphology that was not specific to Spirochetes”. This is indeed a pertinent microscopic observation. The work of Dr. Elisabeth Aberer And Dr. Paul Harrison Duray (below) illustrates that bona fide spirochetes in controlled laboratory conditions, often show profiles which are Not Spiral, but indeed may show the Profile of “curved rods”. Lack of awareness of this peer reviewed manuscript from Year 1991 Is an extreme disadvantage to formulating a correct tissue Pathology diagnosis of Borrelia infection in tissue. The Molecular studies in this case of heart valve tissue which was surgically removed, rigorously confirm that The DNA of Borrelia burgdorferi group Sl (B. afzelii) was resident in the diseased and resected heart valve tissues.
Shape shifting in borrelia burgdorferi:
Non Corkscrew shaped forms:

- Straightened forms
- Ring forms
- Crossed and Abutted Forms
- Granular forms
- Cystic forms
- Cell Wall Deficient forms
- Membrane duplicated (ameboid) forms
- Shrunken and Collapsed forms (Non-spiral)