

Non-Puerperal Breast Infections due to *Staphylococcus lugdunensis*

Staphylococcus lugdunensis is most often identified in the context of infective endocarditis (1) but may also cause peritonitis (2), brain abscesses or vascular prosthetic infections (3). We here report the isolation of *Staphylococcus lugdunensis* from five breast abscesses occurring in non-lactating women between 1990 and 1993.

Case 1. A 57-year-old woman with a history of tumorectomy for breast cancer in 1985 presented in 1990 with discharge from the nipple and presence of a mass on the surgical scar. *Staphylococcus lugdunensis* was isolated in pure culture from material obtained upon surgical drainage of the mass. The patient was cured by a two-week course of oral oxacillin.

Case 2. A 26-year-old woman in her fourth month of pregnancy was admitted to hospital with a spontaneous transcutaneous rupture of a subareolar abscess. *Staphylococcus lugdunensis* was present in three surgically collected pus samples, one of which also yielded peptostreptococci. The patient was cured by a 13-day course of oral oxacillin.

Case 3. A 57-year-old woman presented with a breast mass, fever and chills occurring 30 days after the ablation of a benign tumor. Purulent material collected by fine needle aspiration yielded *Staphylococcus lugdunensis* in pure culture. The patient was cured by a ten-day course of oral pristinamycin.

Case 4. A 64-year-old woman presented with a mass in the left breast eight days after lumpectomy for breast cancer. She underwent incision and drainage of a purulent abscess from which *Staphylococcus lugdunensis* and *Staphylococcus epidermidis* were cultured. She was cured by a two-week course of oral oxacillin.

Case 5. A 39-year-old woman with a history of recurrent breast abscesses was admitted with discharge from the nipple and a subareolar mass. *Staphylococcus lugdunensis* was recovered in pure culture from a surgically obtained pus sample, and the infection resolved following a two-week course of oral oxacillin. The patient's last previous abscess had occurred four years earlier and yielded only *Proteus mirabilis* on culture.

These five patients were all seen at the Edouard Herriot Hospital, Lyon, France. Gram staining of the pus samples showed leukocytes and gram-positive cocci in all cases. All specimens were cul-

tured both for aerobes on blood agar plates and in brain heart broth and for anaerobes in Schaedler broth (bioMérieux, France) and on reduced Columbia agar plates (bioMérieux) incubated in anaerobic jars. All five *Staphylococcus lugdunensis* isolates were susceptible to all antistaphylococcal antibiotics, including benzylpenicillin and oxacillin. Surgical drainage was performed in all cases except no. 3, and all patients received antibiotic treatment. No recurrence of the infections has occurred.

Breast abscesses are very uncommon in non-lactating women and generally have a polymicrobial origin, especially in chronic infections (4). Walker et al. (5) reported recovery of an average of 3.6 different bacteria from each culture-positive specimen, with anaerobes outnumbering aerobes and facultatively aerobic species by a factor of 2 to 1. Bacteria isolated from non-puerperal breast abscesses are probably derived from the flora adhering to the squamous epithelial cells of the galactophores or the skin of the nipple, and indeed, coagulase-negative staphylococci make up 60 % of aerobic isolates. The most common causative species is *Staphylococcus epidermidis*, followed by *Staphylococcus warneri* (5). *Staphylococcus aureus* has been occasionally reported as a cause of breast abscesses (4, 5), but it may be easily confused with *Staphylococcus lugdunensis*, especially if the tube coagulase test is not employed, because the two species share many common attributes. Most strains of *Staphylococcus aureus* produce fibrinogen affinity factor (clumping factor) and possess a weak thermostable DNase, as do typical *Staphylococcus lugdunensis* isolates (1). Since differentiation between these two species may have clinical consequences, it is desirable to perform a tube coagulase test along with a routine test, such as one to detect clumping factor, when staphylococci are found in abscess material.

In the present series three cases (no. 1, 2 and 5) presented as spontaneous acute infections, whereas the other two were associated with recent surgical intervention. This raises questions as to the ecology of the organism. It is perhaps reasonable to consider that *Staphylococcus lugdunensis* might be a skin commensal, since approximately two-thirds of the 229 strains studied by Herchline and Ayers (6) were isolated from skin or soft tissue. In addition, *Staphylococcus lugdunensis* has been isolated from multiple sites, including urine, the perineum, the axilla and the anal mucosa, in two healthy volunteers (1). Although it has not yet been formally demonstrated that *Staphylococcus lugdunensis* can adhere to

the nipple or areolar epithelium, it is reasonable to suppose that it might colonize this region.

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Infectious Arthritis of the Knee due to *Actinobacillus actinomycetemcomitans*

Actinobacillus actinomycetemcomitans is part of the normal flora of the oral cavity and has been known as a pathogen since 1962 (1). It has been described as the etiologic agent of periodontal abscesses, soft tissue infections and endocarditis. We report a case of arthritis of the knee caused by *Actinobacillus actinomycetemcomitans*, the knee being an unusual location of infection with this microorganism.

A 45-year-old male without previous disease complained of pain and swelling in the medial as-

pect of the left knee. Twenty years before he had suffered an open fracture of the left knee with intraarticular foreign bodies, treated by extraction of the foreign material and suture of the wound. He was treated for the present ailment by his physician with antibiotics, antiinflammatory agents and several intraarticular injections of corticosteroids with transient improvement. Three months later, he was admitted to hospital with chronic osteomyelitis of the distal end of the femur, diagnosed by magnetic resonance imaging and scintigraphy. Surgical debridement of the left femoral condyle was performed, and the cavity filled with cancellous bone taken from the proximal tibia. Culture of the material extracted was negative, and the patient was discharged from the hospital on oral cloxacillin.

The patient continued to experience soreness and progressive inflammation of the knee. Seven months later he was readmitted to hospital because of fever, pain, functional impairment and increased swelling of the knee. On physical examination the only significant finding was arthritis of the left knee. The synovial fluid was purulent and hemorrhagic. The knee was drained through an arthroscope, and a synovectomy performed. Culture of the synovial fluid was positive for *Actinobacillus actinomycetemcomitans* in pure growth. The patient was discharged from hospital on ceftriaxone 2 g i.m. daily for one month followed by oral amoxicillin 2 g t.i.d. for one month. His condition improved progressively, and after the two month period of treatment he had complete functional recovery without any evidence of effusion.

Cytological examination revealed polymorphonuclear leucocytes and isolated histiocytes. Results of additional investigations were: hemoglobin level 13.5 g/dl, leukocyte count 8250/mm³ with a left shift, serum glucose level 110 mg/dl, serum creatinine level 1.1 mg/dl, serum sodium level 139 mEq/l, and serum potassium level 4.1 mEq/l. Three sets of blood cultures were negative. The echocardiogram was normal and did not show valvular vegetations. The chest x-ray was also normal.

The aspirated fluid was inoculated on blood, chocolate and MacConkey agar to detect aerobic bacteria, and on anaerobic blood agar, kanamycin-vancomycin laked blood agar and thio-glycolate broth to detect anaerobic bacteria. After 72 hours there was growth of small colonies of a gram-negative, non-motile coccobacillus, with increased growth in a CO₂ supplemented atmosphere. There was no growth on MacConkey