Bacterial Arthritis Caused by *Leptotrichia amnionii*[▽]

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Received 5 December 2006/Returned for modification 23 December 2006/Accepted 17 March 2007

***Leptotrichia amnionii* is an organism that rarely causes female genital tract infection. We describe a case of a male patient with arthritis on the left knee joint due to this organism.**

CASE REPORT

A 59-year-old Japanese man was hospitalized because of swelling and pain of his left knee joint. He had been suffering from diabetes for 25 years and had been undergoing hemodialysis for 3 years. The joint pain first appeared after the patient had fallen to the ground and had been bruised on the knee 2 months before. He had received joint punctures three times at another clinic. The joint fluids aspirated on those occasions had been moderately or faintly bloody but not turbid in appearance. He had not been treated with antibiotics because no bacterium had been detected in the aspirates. A temperature up to 38.5°C had been present since 2 days before the hospitalization. Administration of ceftriaxone (1 g/day) did not improve his joint pain remarkably. After intra-articular irrigation from days 5 to 9 of hospitalization, the swelling and pain in the joint subsided. No crystals were observed in joint fluids by microscopic examination. The antimicrobial drug was switched to cefcapene pivoxil (300 mg/d orally) on day 14, which was administered for more than 8 weeks. No recurrence was observed in subsequent follow-up for 1 year.

At the referral, purulent fluid was aspirated from the affected knee joint. Microscopic examination of the aspirate revealed numerous leukocytes and gram-negative bacilli (Fig. 1a). After incubation of the specimen at 37°C for 4 days under 5% CO₂, gray and translucent colonies of <1 mm in diameter grew on BY chocolate agar (Nippon Becton Dickinson, Tokyo, Japan). Gram stain of the colonies demonstrated filamentous gram-negative organisms with bulbous bodies (Fig. 1b). The isolate could be consecutively subcultured on BY chocolate agar under an anaerobic atmosphere and 10% CO₂ but not under 5% CO₂. The bulbous bodies that appeared in the Gram stain examination of the colonies were observed only in the primary culture on BY chocolate agar and not in subcultures. The isolate did not grow on either Trypticase Soy Agar II with 5% sheep blood (Nippon Becton Dickinson) or Anaero Columbia agar with rabbit blood (Nippon Becton Dickinson), even under an anaerobic atmosphere. The 16S rRNA gene of the isolate was amplified by PCR as described previously (5), and a 1,473-nucleotide product was sequenced with an ABI PRISM 310 genetic analyzer (Applied Biosystems Japan,

Tokyo, Japan). The isolate was finally identified as *Leptotrichia amnionii* because an analysis with the Basic Local Alignment Search Tool showed that the sequence was 99% homologous with those of two *L. amnionii* strains registered in GenBank (accession numbers AY078425 and AY489565). The MICs of antimicrobial agents, determined by the agar diffusion test (Etest; AB Biodisk, Solna, Sweden) on BY chocolate agar with

FIG. 1. Gram stains of the purulent fluid from the affected knee joint (a) and of organisms grown on chocolate agar after incubation under anaerobic atmosphere for 4 days (b). Arrows indicate the gram-negative organisms observed in leukocytes. Bars, 10 μ m.

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[▽] Published ahead of print on 26 March 2007.

TABLE 1. Reported cases of *L. amnionii* infection

Age (yr)	Sex	Source	Underlying condition	Treatment(s) ^a	Reference
27	Female	Amniotic fluid	Second trimester of pregnancy, intrauterine fetal demise	Uterine evacuation by labor induction, AMC	4
41	Female	Intrapelvic abscess	Type 2 diabetes	Drainage, CFZ, GEN, metronidazole, AMC, CIP	3
36	Female	Blood	Vaginal delivery	AMX	1
32	Female	Blood	Vaginal delivery	AMX, AMC	1
59	Male	Joint fluid	Type 2 diabetes, hemodialysis	Drainage, CRO, cefcapene pivoxil	Present case

^a AMC, amoxicillin-clavulanic acid; AMX, amoxicillin; CFZ, cefazolin; CIP, ciprofloxacin; CRO, ceftriaxone; GEN, gentamicin.

anaerobic incubation at 37°C for 4 days, were as follows: amoxicillin, 0.032 µg/ml; ceftriaxone, 0.032 µg/ml; meropenem, 0.008 µg/ml; and ciprofloxacin, >32 µg/ml.

L. amnionii was first isolated from the amniotic fluid of a woman after intrauterine fetal demise. Because of its poor growth in broth, the isolate was differentiated from other *Leptotrichia* species by comparison of the 16S rRNA gene sequences (4). To date, three other cases of *L. amnionii* infection, which were associated with the female genital tract or delivery, have been reported (Table 1) (1, 3). A recent report found that the 16S rRNA gene of *L. amnionii* is detectable in the vaginal fluids of patients with bacterial vaginosis but not in those without the disease (2). These results suggest that the organism colonizes the vagina when the constitution of the normal bacterial flora is broken, ascends the female genital tract, and rarely causes intrapelvic and intrauterine infection.

Unlike the previous reports, the organism from the present case was isolated from a specimen unrelated to either the female genital tract or delivery. Although the route of entry into the knee joint was unclear, we speculate that the impaired immunity of the patient caused by the long-term condition of diabetes and long-term hemodialysis caused temporary bacteremia and secondary infection of the knee joint. The incident of falling to the ground and repeated aspiration of joint fluid before hospitalization may have not been important factors for the infection because the patient did not recall any open injury on the knee at the time of the incident, no drug was injected

into the joint during the aspirations, and, as far as we know, no report has described the isolation of the organism from the environment, including soil and water.

The drug susceptibility test indicated that ceftriaxone was likely highly effective in the present case. However, we consider that the intravenous administration of ceftriaxone only was insufficient, and as in other cases of bacterial arthritis, the drainage of purulent substances from the knee joint was essential for the treatment of the patient. Because the numbers of reported cases have been limited, the antibiotics preferred for the treatment of *L. amnionii* infection remain undetermined. We consider that the organism has been missed in routine examinations in clinical laboratories because of its fastidiousness. Further microbiological and clinical information on this organism with prudent culture is required to derive appropriate treatment protocols for *L. amnionii* infections.

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