

Isolation of *Neisseria canis* in Mixed Culture from a Patient after a Cat Bite

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Received 30 January 1989/Accepted 7 April 1989

We report a case of identification of *Neisseria canis* in a human patient after a cat bite. This organism was isolated from a mixed culture together with *Pasteurella multocida* and *Eikenella corrodens*. It is the second case report of a human infection.

Since its first description by Berger (1) in 1962, after isolation from the pharynx of a normal dog, *Neisseria canis* has only been isolated once in humans (after a cat bite) (4).

In the eighth edition of *Bergey's Manual of Determinative Bacteriology*, Reyn (5) listed this species with the species *incertae sedis*. Vedros (9) classified it as a species of the genus *Neisseria*. The name *Neisseria canis* is mentioned in the *Approved Lists of Bacterial Names* (8).

In view of the extreme rarity of the isolation of this species in humans, we considered it worthwhile to report one case.

Case report. A 36-year-old female patient was bitten on the forearm by her cat; both she and her cat were in good health. Two hours later, she went to the hospital. Due to the pain which she experienced and the redness and elevated temperature of the cat bite, she consulted a general physician who prescribed amoxicillin. The patient took the first dose 3 h after the cat bite, and bacteriological swabs were taken 3 and 6 h after the bite.

The bite resolved favorably with amoxicillin treatment at a dose of 3 g/day for 1 week. Hospital admission was not required in view of the regression of the local signs and the absence of regional or systemic signs.

Bacteriological diagnosis and discussion. The swab from the cat bite wound contained serous fluid. No bacteria were detected by direct examination after Gram staining. The swab was inoculated onto enriched media, i.e., chocolate agar with or without vancomycin and blood agar, and the plates were incubated at 37°C in an atmosphere enriched with 8 to 10% CO₂.

Upon bacteriological examination, two species were distinguished, *Pasteurella multocida* and *Eikenella corrodens*. An additional gram-negative, oxidase- and catalase-positive diplococcus was sent to the Centre National de Référence des Méningocoques et *Neisseria* Apparentées with the presumptive identification *Neisseria* sp.

A detailed study of the strain LNP 4676 (Laboratoire des *Neisseria* Paris) confirmed the presumptive identification of *Neisseria*, and yellow pigmentation and a flat aspect of colonies were observed, corresponding to Berger's first description (1, 2). The strain did not acidify any of the following substrates in cystine-tryptic agar (Difco Laboratories) medium: glucose, maltose, levulose, sucrose, mannitol, and lactose. Nitrates but not nitrites were reduced. β-Galactosidase and gamma-glutamyltransferase were absent.

There was no hydrolysis of tributyrine, and DNase was absent. The MIC of acetazolamide (3) was 62.5 μg/ml.

All of these characteristics suggest that strain LNP 4676 belongs to the asaccharolytic neisseriae, which are divided into two groups and include the following species: (i) *N. flavescens*, *N. cinerea*, *N. canis*, and *N. elongata*, which have common characteristics of the genus *Neisseria*, and (ii) *Branhamella catarrhalis* and the three other related species, *N. caviae*, *N. ovis*, and *N. cuniculi*. The definitions of these two groups of asaccharolytic neisseriae, those which are related to *Branhamella* spp. and those which are not, are given in references 7 and 9.

The second group (related to *Branhamella* spp.) was eliminated on the basis of the colonies (pigment always absent), the differences in reduction of nitrates and nitrites, the absence of hydrolysis of tributyrine, and the absence of DNase. The species with the phenotypic characteristics closest to LNP 4676, *N. ovis*, induces marked hemolysis on horse blood agar but does not have any gelatinolytic activity (6, 7).

Among the first group of asaccharolytic neisseriae, *N. flavescens* was excluded since the strain LNP 4676 does not synthesize polysaccharides; *N. cinerea* does not reduce nitrates but reduces nitrites, as does *N. elongata*, which is rod shaped.

The marked gelatinolytic activity detected by the technique of Frazier confirmed the diagnosis of *N. canis*. The strain, stored in the laboratory under reference LNP 4676, was compared with the type strain of the species ATCC 14687 and found to be identical, including slight acidification of the cystine-tryptic agar-glucose medium after 48 h.

Of the three species isolated from this cat bite, i.e., *P. multocida*, *E. corrodens*, and *N. canis*, only *P. multocida* was considered responsible for the characteristic clinical signs described above. *E. corrodens* can be an opportunistic pathogen. Bites are very frequently polymicrobial. *P. multocida* is the bacterial species most frequently responsible for complications (tenosynovitis, osteoarthritis, or septicemia). In our experience, *E. corrodens* has been frequently isolated from mixed infections from human and animal bites. Isolations of *N. canis* are too exceptional to assign this organism a pathogenic role apart from that of an opportunistic bacterium after septic inoculation.

Hoke and Vedros reported the opportunistic property of *N. canis* (4, 8), and Berger described this species as a commensal organism of the dog pharynx (1). The simultaneous presence of the three species in our case renders

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unlikely the possibility of the responsibility of *N. canis* in the development of the clinical signs. The only possible conclusion is the presence of *N. canis* in the normal buccal flora of dogs and cats.

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