Short Communication

An Unusual Case of Brain Abscess by *Gemella morbillorum*

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**SUMMARY:** A case of deep brain abscess by *Gemella morbillorum* is described. Due to high fever, lethargy, severe headache, and the risk of intraventricular rupture of the suppurative lesion, a CT-guided stereotactic aspiration of the abscess was successfully performed. The patient responded well to a 6-week course of meropenem, metronidazole, and fluconazole. *Gemella* spp. should not be considered as trivial commensals of the mucous membranes, but appear as emerging pathogens involved in endocarditis, septic shock, and necrotizing pneumonia, as well as in serious intracranial infections.

*Gemella morbillorum* is an anaerobic-to-aerotolerant, Gram-positive, no motile, and non-spore-forming coccus that can be observed in singles, pairs, and short chains. It has been grouped with viridans streptococci, from which it can be distinguished by biochemical activities and molecular tests (1). *G. morbillorum* is a normal resident microbiota of several mucosal surfaces, including the oropharynx and the gastrointestinal and female genital tract, and its clinical significance is unclear. Infections by *G. morbillorum* of the central nervous system (CNS) are unusual, and brain abscesses reported in the literature include description of only four clinical cases (1-3). Endocarditis, septic shock, and other cardiovascular infections (4) are the most frequently reported diseases caused by such organisms; however, sinusitis, pneumonia, gynecological infections, empyema, septic arthritis, and infections of the eye can also be found in the literature (3).

A 75-year-old white woman presented to a primary care clinic with a 7-day history of headache, fever, nausea, and vomiting. A first cranial CT showed a minimally contrast-enhancing right frontal round mass (diameter, 4 cm), adjacent to the anterior horn of the lateral ventricle. Such a lesion was surrounded by a hypodense halo consistent with oedema and produced a shift of the brain midline to the left. The initial suspicion based on this first imaging approach was an astrocytoma. Corticosteroid therapy was started.

One month after the beginning of the illness, the patient was referred to our institution for neurosurgical consultation. Upon admission, neurological evaluation revealed progressive ideomotor impairment and gait disturbances, without clinical signs of meningitis. Laboratory analysis showed a peripheral leukocyte count of 12,000 cells/mm³, an increased erythrocyte sedimentation rate of 60 mm/h and a CD4 lymphocyte count within the normal range. A CD4 lymphocyte count was not elevated.

Ten days after the abscess aspiration, the patient became conscious, her headache became mild, and she began to walk...
insidiously, included all of the above reported nonspecific logical disease. In contrast, our case presentation, more hemiparesis, or seizures (3), which could suggest a neuro-

with more specific clinical features such as neck stiffness (1,2), lethargy) that may be seen with many other syndromes (1). The empiric medical therapy for brain abscess usually in-
cludes a β-lactam plus metronidazole (6).

G. morbillorum was isolated for the first time by Tunnicliff from the blood of a subject with measles (7). Such bacterium was then named Diplococcus morbillorum, Streptococcus morbillorum, and was finally included in the genus Gemella with its present name in 1988 (8). Until now, only four cases of G. morbillorum brain abscess have appeared in the litera-
ture. The first report by Murray et al. dealt with a case presenting as meningitis (1). Two other publications appeared more recently in 2002 and in 2003 (2,3). Messori et al. have reported a young male without previous clinical records, with the exception of canine avulsion and chronic sinusitis; this subject presented with fever, headache, lethargy, nausea, and vomiting and underwent a stereotactic, medical imaging approach with a successful outcome (2). Spagnoli et al. have published the most recent study on G. morbillorum brain abscess presenting with hemiparesis and seizures (3).

CNS infections due to G. morbillorum are a diagnostic and therapeutic challenge for the physician because of the insidious presentation and evolution, the difficulty of making a connection with the primary septic site, and the need for a long course of antibiotic association (3). Indeed, the clinical presentation of cerebral abscess includes nonspecific signs and symptoms (e.g., headache, fever, nausea, vomiting, and lethargy) that may be seen with many other syndromes (1). However, the only four cases of brain abscess due to G. morbillorum reported in the literature have been associated with more specific clinical features such as neck stiffness (1,2), hemiparesis, or seizures (3), which could suggest a neurological disease. In contrast, our case presentation, more insidiously, included all of the above reported nonspecific signs and symptoms, without any neck stiffness, hemiparesis, seizures, or other clinical features, which could draw the physician’s attention to a primary neurological impairment. Based on the CD4 lymphocyte count, our patient was immu-

c<i>nocompetent. However, previous cases of brain abscess due to Gemella have been reported in immunocompetent patients (2,9).

Published hypotheses regarding pathogenetic mechanisms of Gemella infections include downregulation of IL-12 and IFN-γ, which are well known to play a crucial role in the eradication of many different pathogens (10). Also, stimulation of antineutrophil antibodies has been reported to be caused by the presence of G. morbillorum in blood and CSF of a 17-year-old girl (11). Both mechanisms may account for the possibility of a very late metastasis from an original primary infectious site. Indeed, our patient had orodental procedures some years ago and an infectious pleural disease several months earlier. Since G. morbillorum has been reported as a cause of pleural infectious exudates (5), it is possible that in the present case it spread to the brain from the more recent pleural infection or from an old primary oral infectious site, as reported previously for another G. morbillorum brain abscess, which presented 7 years after the avulsion of both canines (2). Indeed Gemella spp. are part of the commensal bacteria of the oral cavity (1,2).

Metronidazole susceptibility is a controversial issue in therapy for Gemella infections.

Some isolates of G. morbillorum are metronidazole sensi-
tive (12). In contrast, the strain of the present study and other isolates reported in the literature (3) are resistant to such an important antibiotic, which is often used in the abscess therapy, due to its broad antimicrobial activity, rapid bacterial killing, good tissue penetration, moderate adverse effects, low cost, and the possibility of sequential parenteral and oral administration (13). Kuriyama et al. have shown that the frequency of metronidazole resistance among G. morbillorum strains isolated from cranial infections is 10% (12).

G. morbillorum brain abscess requires a subtle clinical interpretation, a fine radiological follow-up, and a careful microbiological diagnosis in order to avoid lethal complic-
ations. However, based on the above reported microbiological results, which were supported by the biochemical pattern of our strain and by data from the literature, we are confident of this isolate speciation, which contributed significantly to the successful outcome of this case.

Fig. 1. Coronal slices from post-contrast brain CT showing a minimally contrast-enhancing right frontal round mass (diameter, 4 cm), adjacent to the anterior horn of the lateral ventricle (arrow). The lesion was surrounded by a hypodense halo consistent with oedema and produced a shift of the brain midline to the left.
Based on our experience and on scientific literature (2,6,9), a possible regimen for Gemella brain abscess should include a broad spectrum β-lactam (e.g., meropenem or amoxicillin) plus an anti-anaerobic drug (e.g., metronidazole or clindamycin) at full dosage for at least 6 weeks.

Gemella organisms are very often isolated in mixed infection (9,14). Therefore, we strongly believe that the lack of organisms other than Gemella in the culture of our clinical sample could be easily explained by the previous empiric treatment, which would control possible co-pathogens (fungi, Gram-negative anaerobic rods). Withdrawal of either metronidazole or fluconazole would allow one or more previously controlled, but not eradicated, potential pathogens to grow again. When planning a long therapeutic schedule, such a risk should be taken into account, particularly after the surgical procedure, due to the possibility of the spread of infectious exudates to other brain districts, as reported by other authors (2).

In order to reduce oedema around an abscess, our patient received steroids for several weeks before and for 2 weeks after the microbiological diagnosis (15). Many antibiotics, including β-lactams, cannot reach adequate concentrations in brain tissue due to steroid administration (16). However, dexamethasone does not have deleterious effects on fluconazole in brain tissue due to steroid administration (16). However, after the microbiological diagnosis (15). Many antibiotics, other brain districts, as reported by other authors (2).

In conclusion G. morbillorum should not be considered a simple commensal of the mucous membranes, but an emerging pathogen involved in severe diseases, including brain abscess.

REFERENCES


