

## Dacryocystitis Involving *Parvimonas micra* and *Bacteroides thetaiotaomicron* Infection

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### INTRODUCTION

Dacryocystitis is an inflammation of the nasolacrimal canals. The disease is most prevalent in pediatrics and individuals above 40 years of age, following a bimodal age distribution, with predilection for white or female populations.<sup>1</sup> Dacryocystitis commonly is caused by acute infection of a ductal obstruction and appears as an erythematous, tender, inflamed medial orbit. Treatment of infectious dacryocystitis involves warm compress and oral antibiotics.

Common infectious organisms involved in dacryocystitis include *Staphylococcus* spp., *Streptococcus* spp., *Haemophiles influenza*, and *Pseudomonas aeruginosa*.<sup>1</sup> No known cases were reported in the medical literature of lacrimal duct infection by *Parvimonas micra*, a gram-positive organism native to the human gastrointestinal flora and associated with blood and oropharyngeal infections after dental procedures,<sup>2</sup> or *Bacteroides thetaiotaomicron*, a component of gastrointestinal flora and fecal matter.<sup>3</sup>

This case of dacryocystitis presented with cultures positive for *P. micra* and *B. thetaiotaomicron*. Whereas common infectious organisms implicated in dacryocystitis are aerobic, *P. micra* and *B. thetaiotaomicron* are anaerobes with unique pharmaceutical resistances. Currently, empiric treatment consists of oral antibiotics with gram positive and negative coverage, such as amoxicillin/clavulanate or clindamycin.<sup>1</sup> Awareness of these novel causative agents of dacryocystitis can help tailor empiric antibiotic therapies.

### CASE REPORT

A 50-year-old Hispanic female presented to the emergency department with two days of severe eye pain, increased tearing, decreased vision, and foreign body sensation involving only the right eye. Past medical history was significant for diabetes mellitus type 2 with hyperglycemia, hyperlipidemia, obesity, and one month of diagnosed hypertension. She reported two previous episodes of similar symptoms in 1994 and 2001, for which there was no available documentation. In 2001, she required incision and drainage, followed by amoxicillin.

Physical exam revealed an injected right conjunctiva with purulent discharge and a right eye pressure of 35 mmHg, bilateral middle ear effusions, and swollen right and left turbinates. The left eye was unremarkable. The patient reported pain with right head turn and physical exam revealed palpable right cervical lymphadenopathy; her history was otherwise unremarkable. The patient denied tobacco, alcohol, or

illicit substance use. Vancomycin 20 mg/kg IV was started. The ophthalmology service was consulted.

Slit lamp exam revealed periorbital edema and ecchymosis as well as induration inferior to the right medial canthus. Conjunctiva showed I+ injection; otherwise, anterior segment exam was normal. Dilated fundus exam revealed symmetric cup to disc ratios of 0.8. Computed tomography of the head and neck with contrast revealed right dacryocystitis with surrounding pre-septal cellulitis with subtle stranding in the medial extraconal fat along the posterior aspect of the fluid collection.

The patient was diagnosed with dacryocystitis with subsequent spread to the orbit based on induration inferior to the right medial canthus, in addition to orbital cellulitis. Piperacillin/tazobactam was started when the patient was admitted to inpatient services. On inpatient day one, the infectious disease service recommended switching from vancomycin to linezolid 600 mg/D5W 300 mL IV due to worsening infection. Rigid endoscopy was negative for sinus disease or bony erosion, but revealed a superficial pre-septal abscess. On inpatient day two, the patient was brought to the operating room and swabs from the medial canthus were sent for culture. The patient underwent dacryocystorhinostomy with tube placement, during which the abscess was drained and sent for culture.

On post-operative day two following dacryocystorhinostomy, the patient's pain improved, and the infection began showing signs of clearing. On post-operative day four, the cultures and susceptibilities returned. Anaerobic culture showed moderate growth of *B. thetaiotaomicron* and heavy growth of *P. micra* alongside heavy growth of additional mixed flora. Aerobic culture showed moderate growth of *Staphylococcus lugdunensis* and three colonies of *Staphylococcus epidermidis*. Piperacillin/tazobactam was switched to ampicillin/sulbactam 3 g in 100 mL IV piggyback. The patient was discharged post-operative day six on amoxicillin/clavulanate 875 mg twice daily.

### DISCUSSION

No known cases in the literature depicted dacryocystitis caused by *P. micra* or *B. thetaiotaomicron*. However, Barnett et al.<sup>4</sup> reported several panophthalmitis cases involving *P. micra* infection, demonstrating *P. micra* can infect tissue with anatomic proximity to the tear ducts. *P. micra* has been reported as an infective cause of chronic periodontitis, endocarditis, renal abscesses, and psoas abscesses.<sup>5-7</sup> These reported findings were expected, given the organism is a normal part of gastrointestinal, oral, genital, and potentially skin flora.<sup>2,8</sup> *Staphylococcus lugdunensis* and *Staphylococcus epidermidis*, the aerobic infecting agents present in our patient's tear duct culture, are also components of normal skin flora and commonly implicated in nasolacrimal duct infections.<sup>9,10</sup> Because *S. lugdunensis*, *S. epidermidis*, and *P. micra* are components of skin flora, it would be logical to assume skin flora may have entered the tear ducts. Furthermore, the patient owned a dog and allowed the dog to lick her face; hence oral flora could have entered the tear ducts through direct contact of the adnexa oculi to canine saliva, resulting in *P. micra* infection.<sup>11</sup>

*B. thetaiotaomicron*, the other anaerobic infective agent, is part of gastrointestinal tract flora.<sup>3</sup> No evidence suggested *B. thetaiotaomicron* is a normal component of skin flora, reducing the likelihood of

our findings being due to contamination of cultures by skin microbes. Gastrointestinal and skin flora may have entered the tear ducts via poor hand hygiene after toilet use, followed by touching of the inner eye. The patient's anaerobic infection played a large role in her dacryocystitis as suggested by the heavier growth in the anaerobic cultures relative to the aerobic cultures.

Both organisms display drug-resistances that should be considered during treatment. *P. micra* commonly exhibits resistance to doxycycline (11.3% resistant) and clindamycin (47.3% resistant).<sup>12</sup> A study examining isolates of *B. thetaiotaomicron* showed resistance to moxifloxacin (44.9% resistant), clindamycin (51.0% resistant), and cefoxitin (14.3% resistant).<sup>13</sup> Clindamycin is a common empiric dacryocystitis treatment.<sup>14</sup>

This case reported that *P. micra* and *B. thetaiotaomicron*, which commonly exhibit clindamycin resistance, can be implicated in dacryocystitis. This report should allow clinicians to reassess whether clindamycin is a suitable empiric treatment choice for dacryocystitis, especially in patients with risk factors for *P. micra* and *B. Thetaiotaomicron* infection. Additionally, this case informed clinicians that, if dacryocystitis is refractory to the listed antibiotics, these organisms should be considered. Lastly, consideration of infection by these agents may be warranted in patients with frequent facial exposure to canine oral flora.

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