Indian Journal of Ophthalmology

Vol 66, Issue 4, April 2018

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Actinomycetes canaliculitis complicating congenital nasolacrimal duct obstruction in an infant

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Actinomyces israelii is a Gram-positive anaerobic organism commonly associated with canaliculitis in adults. Pediatric canaliculitis is relatively rare, especially in infancy. We report the case of an 11-month-old boy who presented with co-existing canaliculitis and congenital nasolacrimal obstruction. The presenting signs included epiphora, discharge, conjunctival congestion, and matting of lashes. On examination, punctal pouting, regurgitation, and yellow canaliculiths were noted. A punctoplasty and canalicular curettage were performed along with nasolacrimal probing. Microbiological tests confirmed the organisms to be A. israelii. We discuss the clinical features and management of Actinomyces-associated canaliculitis and review the available literature on pediatric canaliculitis.

Key words: Canaliculith, dacryolith, epiphora, lacrimal duct, punctoplasty, watering

Actinomyces israelii is a Gram-positive anaerobic bacterium that is difficult to isolate and identify. It typically causes infections of hollow spaces such as the canaliculi, with the formation of canaliculiths and is associated with a chronic, purulent, granulomatous infection with the presence of yellowish sulfur granules.[1] The mainstay of treatment in canaliculitis is punctoplasty and curettage with a low incidence of postsurgical epiphora.[1‑4] Preexisting nasolacrimal duct (NLD) obstruction with canaliculitis is difficult to diagnose, although it has been observed in few adult cases following successful curettage.[2] There have been reports of pediatric canaliculitis in literature, but to the best of our knowledge, co-existent congenital nasolacrimal duct obstruction (CNLDO) with canaliculitis has not been previously described in literature.

Case Report

An 11-month-old male child presented with symptoms of watering and discharge in the left eye since birth. The complaints had persisted even after lacrimal sac compression. Redness and discharge in left eye had increased for 3 weeks. In the clinic, the child did not cooperate for an examination with a hand-held slit lamp. A fluorescein dye disappearance test was performed which showed delayed clearance in the left eye. With a diagnosis of the left-sided CNLDO, an examination under anesthesia with irrigation and probing was scheduled.

On examination, the right eye was unremarkable with a patent lacrimal system. The left eye conjunctiva showed some congestion, the cornea was clear and anterior segment, and fundus examinations were normal. Copious discharge was noted over left upper punctum [Fig. 1a]. Using two cotton tip applicators, the canaliculus was squeezed – from the distal part, gradually upward toward the punctum and multiple small yellowish granules were expressed out [Fig. 1b and c]. A vertical incision was made through the posterior wall of the punctum and vertical canaliculus followed by a horizontal incision along a portion of the horizontal canaliculus. All the discharge and granular material were curetted out. The lower punctum was normal, and irrigation through lower canaliculus showed regurgitation through upper punctum suggesting co-existent CNLDO. A hard stop was felt during the irrigation further confirming the location of the obstruction. On probing through lower punctum, a membranous obstruction was encountered at lower nasolacrimal duct opening, which was then overcome. Nasal endoscopy confirmed the presence of probe through NLD opening. Subsequent irrigation was patent. Microbiology of the expressed material showed delicate, branched, Gram-positive filaments irregularly arranged in a background of amorphous material suggestive of Actinomyces species [Fig. 2]. The species was subsequently identified as A. israelii on the anaerobic blood agar plates. The child was administered fortified cefazolin eye drops for 2 weeks. At 8-month follow-up, the child was asymptomatic.

Discussion

Symptoms of canaliculitis typically include epiphora, chronic conjunctivitis, swelling over the medial canthus, a “pouted” or everted punctum, and purulent discharge.[2] The presence of...
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<th>Authors, year</th>
<th>Age/sex</th>
<th>Previous diagnosis</th>
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<th>Treatment</th>
<th>Co-existing conditions</th>
<th>Antibiotic therapy</th>
<th>Outcome</th>
<th>Duration from initial symptom to diagnosis of canaliculitis</th>
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<tbody>
<tr>
<td>Pine et al., 1960 (Case 1)</td>
<td>6/male</td>
<td>Conjunctivitis</td>
<td>Discharge</td>
<td>Induration, conjunctival congestion, canalicular concretions, enlarged punctum</td>
<td>A. israelii</td>
<td>Canaliculotomy and canalicular curettage</td>
<td>Canaliculitis</td>
<td>Topical chloromycetin</td>
<td>Resolved</td>
<td>3 years</td>
</tr>
<tr>
<td>Pine et al., 1960 (Case 2)</td>
<td>14/male</td>
<td>Conjunctivitis, chalazion</td>
<td>Discharge</td>
<td>Swelling, conjunctival congestion, thickening of medial eyelid</td>
<td>A. israelii</td>
<td>None</td>
<td>Nasolacrimal duct obstruction</td>
<td>Neosporin ointment and achromycin ophthalmic oil</td>
<td>Resolved</td>
<td>1 year</td>
</tr>
<tr>
<td>Seal et al., 1981</td>
<td>14/male</td>
<td>Conjunctivitis</td>
<td>Discharge</td>
<td>Swelling, induration</td>
<td>Arachnia propionica*</td>
<td>Canaliculotomy and canalicular curettage</td>
<td>None</td>
<td>Topical and oral penicillin, penicillin syruping</td>
<td>Resolved</td>
<td>2 months</td>
</tr>
<tr>
<td>Pavilack and Frueh, 1992</td>
<td>10/female</td>
<td>NA</td>
<td>Epiphora</td>
<td>Punctal regurgitation, pouting punctum, thickening of medial eyelid, concretions</td>
<td>Not reported</td>
<td>Canalicular curettage</td>
<td>None</td>
<td>Topical sulfacetamide sodium</td>
<td>Resolved</td>
<td>20 months</td>
</tr>
<tr>
<td>McKellar and Aburn, 1997</td>
<td>10/female</td>
<td>Recurrent conjunctivitis</td>
<td>Discharge</td>
<td>Punctal regurgitation, pouted punctum, erythema of the plica and lower eyelid, concretions</td>
<td>A. israelii</td>
<td>Two-snip punctoplasty, curettage and probing</td>
<td>None</td>
<td>Topical cefazolin</td>
<td>Resolved</td>
<td>6 months</td>
</tr>
<tr>
<td>Park et al., 2004</td>
<td>5/female</td>
<td>Nasolacrimal duct obstruction</td>
<td>Discharge**</td>
<td>Punctal regurgitation, eyelid erythema, concretions</td>
<td>Actinomyces spp., S. viridans, E. corrodens, Peptostreptococcus, Obstridiom, and Propionibacterium§</td>
<td>Punctoplasty, curettage</td>
<td>Idiopathic thrombocytopenic purpura, past history of immunosuppression</td>
<td>Not specified</td>
<td>Resolved</td>
<td>-</td>
</tr>
<tr>
<td>Yuksel et al., 2012</td>
<td>12/female</td>
<td>NA</td>
<td>Epiphora, discharge</td>
<td>Enlarged punctum, swelling, induration</td>
<td>A. israelii</td>
<td>Canalicolotomy and canalicoloplasty with bicanalicular intubation</td>
<td>None</td>
<td>Topical fortified cefazolin + ciprofloxacain and oral penicillin V</td>
<td>Resolved</td>
<td>7 years</td>
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<tr>
<td>Ding et al., 2017</td>
<td>6/male</td>
<td>NA</td>
<td>Discharge</td>
<td>Pouting punctum, lacrimal fistula</td>
<td>S. constellatus</td>
<td>Canaliculotomy with fistula excision‡</td>
<td>Lacrimal fistula</td>
<td>Levofloxacin drops and gatifloxacin ointment</td>
<td>Resolved</td>
<td>5 years</td>
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</tbody>
</table>
**Table 1: Contd...**

<table>
<thead>
<tr>
<th>Authors, Age/sex</th>
<th>Presenting symptoms</th>
<th>Clinical findings</th>
<th>Organism identified</th>
<th>Antibiotic therapy</th>
<th>Co-existing conditions</th>
<th>Duration from initial to diagnosis</th>
<th>Outcome</th>
<th>Co-existing conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 months</td>
<td>Congenital NLDO</td>
<td>Epiphora, discharge, recurrent chalazia, conjunctivitis, epiphora</td>
<td>A. israelii</td>
<td>Cefazolin</td>
<td>Canaliculotomy, curetage, antibiotic irrigation, nasolacrimal duct probing</td>
<td>2 months</td>
<td>Resolved</td>
<td>Canaliculotomy, curetage, antibiotic irrigation, nasolacrimal duct probing</td>
</tr>
<tr>
<td>67</td>
<td>54</td>
<td>1,12</td>
<td>1. Indian Journal of Ophthalmology</td>
<td>Table 1</td>
<td>Canaliculitis</td>
<td>NLDO and chalazion</td>
<td>Propionibacterium propionicus</td>
<td>Antibiotic therapy</td>
</tr>
</tbody>
</table>

*Arachnia propionica has been reclassified as P. propionicus, The patient had previously undergone probing with intubation once and balloon dacryoplasty twice. The second time, with a monocanaliculat stent placement, Microscopic examination of the concretions suggested Actinomyces spp. Cultures grew S. viridans, E. corrodens species. Anaerobic cultures grew Peptostreptococcus, Clostridium, and Propionibacterium. Initially, the patient underwent a punctum sparing canaliculotomy which was not successful in resolving the symptoms, Brazier and Hall and Kaliki et al. in their separate series, have included one child each with canaliculitis; aged 1 month and 96 months, respectively. Similarly, Smith in his series has reported a case of related canaliculitis in a 17-year-old female. However, the details of those patients were not specified in their papers and therefore, those cases are not included in this table. NA: Not available, A. israelii, Actinomyces israelii, S. viridans: E. corrodens: Streptococcus constellatus, P. propionicus: Propionibacterium propionicus.

**Conclusion**

Canaliculitis in children is uncommon, and literature suggests that in children, NLDO and chalazion are common conditions.
that canaliculitis masquerades as. Typically, epiphora, excessive discharge, and conjunctivitis along with eyelid swelling that does not respond to conventional treatment should raise the clinical suspicion of canaliculitis.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References