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Case report

Case report of the family transmission of *Streptococcus pyogenes* orbital cellulitis

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ABSTRACT

Purpose: This is a case report of an unusual case of the family transmission of *Streptococcus pyogenes* infection in three siblings. One brother contracted the infection which resulted in orbital cellulitis of two of his siblings, in the absence of anatomical or immunological predisposing factors.
Observations: A young boy contracted an uncomplicated *S pyogenes* upper respiratory tract infection. The twin brother closely followed by the older sister both developed a *S pyogenes* orbital cellulitis a couple of days later.
Conclusions and importance: To our knowledge, this is the first case ever reported of family transmission of orbital cellulitis. This highlights the importance of early diagnosis and treatment of *S pyogenes*, and the role of throat cultures as means of diagnosis even in the absence of symptoms or signs of pharyngitis.

1. Introduction

Streptococcus pyogenes represents most of the group A strains of *Streptococcus* (GAS) and causes various types of infections. Orbital cellulitis is a rare but potentially dangerous GAS infection with an incidence of 3.51 per 1.000.000 individuals/year.[1]

The nasal sinuses are the main source of contamination of the orbit, with ethmoid sinusitis affecting around 96% of children with orbital cellulitis.[2,3] Two normal anatomic factors presumably favor the spread of infection towards the orbit: the thin lamina papyracea separating the orbit from the ethmoid sinus, and the valveless superior orbital veins facilitating perivascular invasion.[4] When present, certain anatomic anomalies such as polypoid sinus mucosa and dehiscence of the lamina papyracea can further contribute to infection dissemination.[2]

Herein we report the infrequent occurrence of familial *S pyogenes* orbital cellulitis and subperiosteal abscess.

2. Case report

A previously healthy 4-year-old boy (patient 1) was brought to our center after 4 days of fever, vomiting, and progressive left eyelid redness and swelling (Fig. 1). His exam revealed left proptosis, erythema and edema of the upper and lower left eyelids, 20/20 vision in both eyes (Allen optotypes), normal pupillary responses and limited left eye movements in all directions of gaze. An orbital computed tomography demonstrated pansinusitis and subperiosteal abscesses involving the left medial (4 × 16-mm-) and upper orbital (6 × 15-mm-) walls (Fig. 2). Ocular and nasal swabs were noncontributory, but a throat culture demonstrated the group A beta-hemolytic streptococcal infection. The patient was successfully treated with a combination of intravenous cefotaxime, cloxacillin and clindamycin and was discharged 15 days later to complete ambulatory treatment. The total length of intravenous antibiotic treatment was one month, followed by one month of oral amoxicillin.

Two days after initial presentation of our patient, his 7-year-old sister (patient 2) was brought in for evaluation. She had a four-day history of fever and nasal congestion and developed eyelid edema on the day of admission. She was previously healthy and the exam showed 20/20 vision in both eyes (Snellen), normal pupillary responses, left proptosis, redness and severe swelling of the eyelids (Fig. 3). Extraocular movements were normal. Her computed tomography demonstrated left frontal, maxillary and ethmoidal

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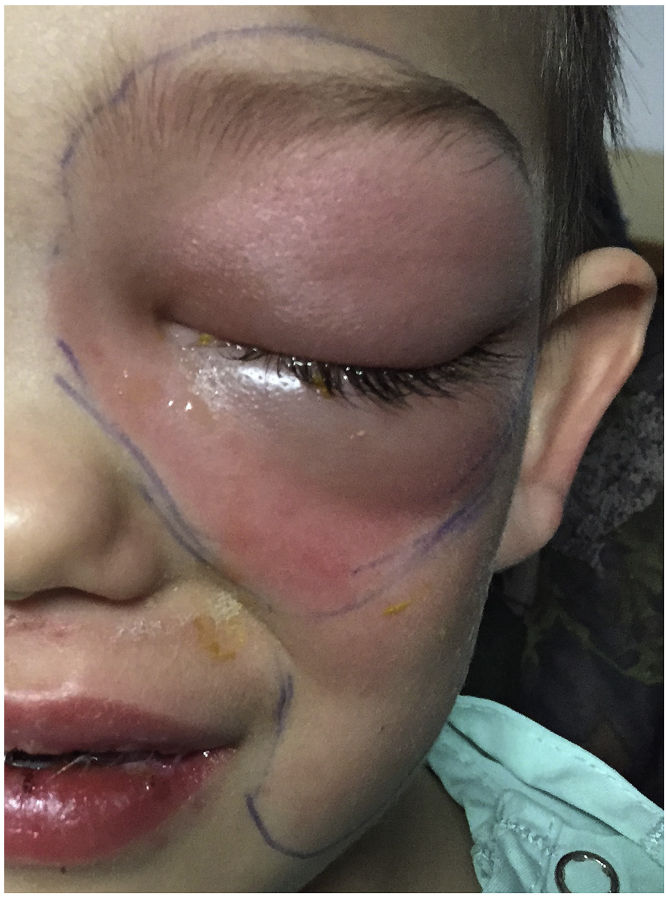

Fig. 1. Patient 1 at presentation. Color photograph of face showing left upper and lower eyelid swelling and redness consistent with a cellulitis.

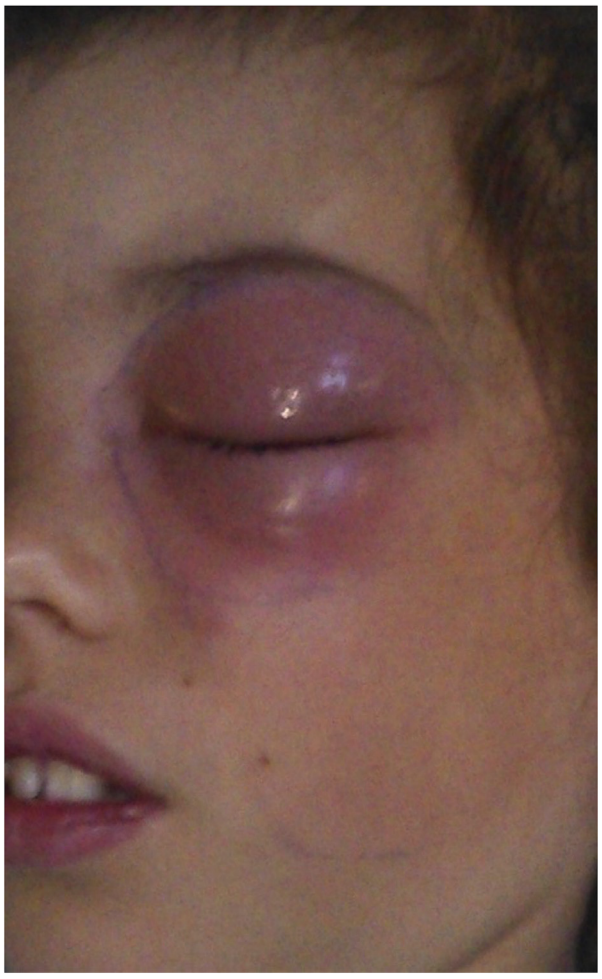

Fig. 3. Patient 2 at presentation. Color photograph of face showing left upper and lower eyelid swelling and redness consistent with a cellulitis.

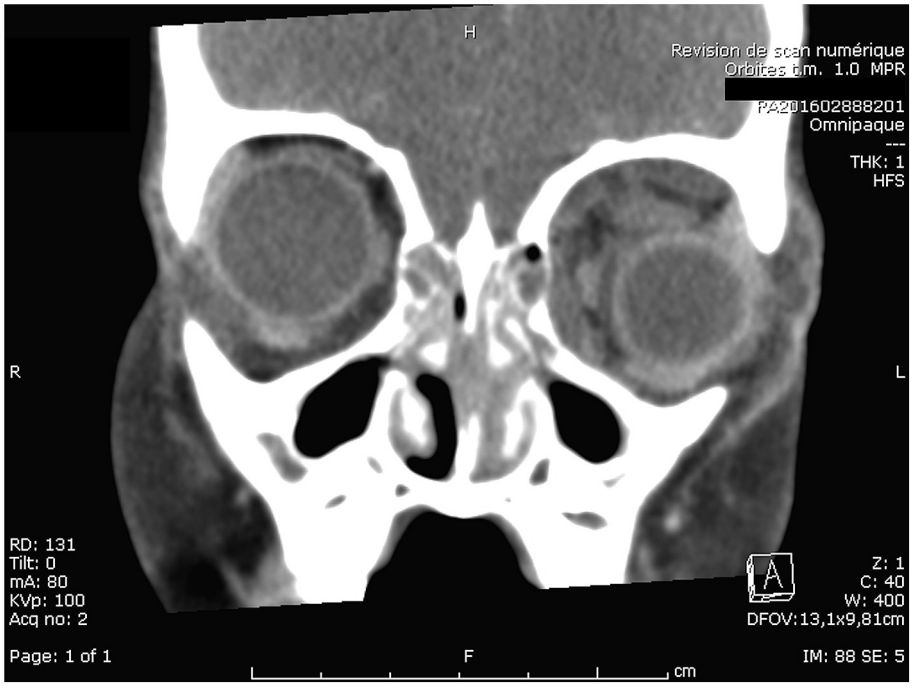

Fig. 2. Patient 1 at presentation. Orbit computed tomography showing pansinusitis and subperiosteal abscesses involving the left medial (4 × 16-mm-) and upper orbital (6 × 15-mm-) walls. There is inferiotemporal displacement of the left globe by the infectious collections.

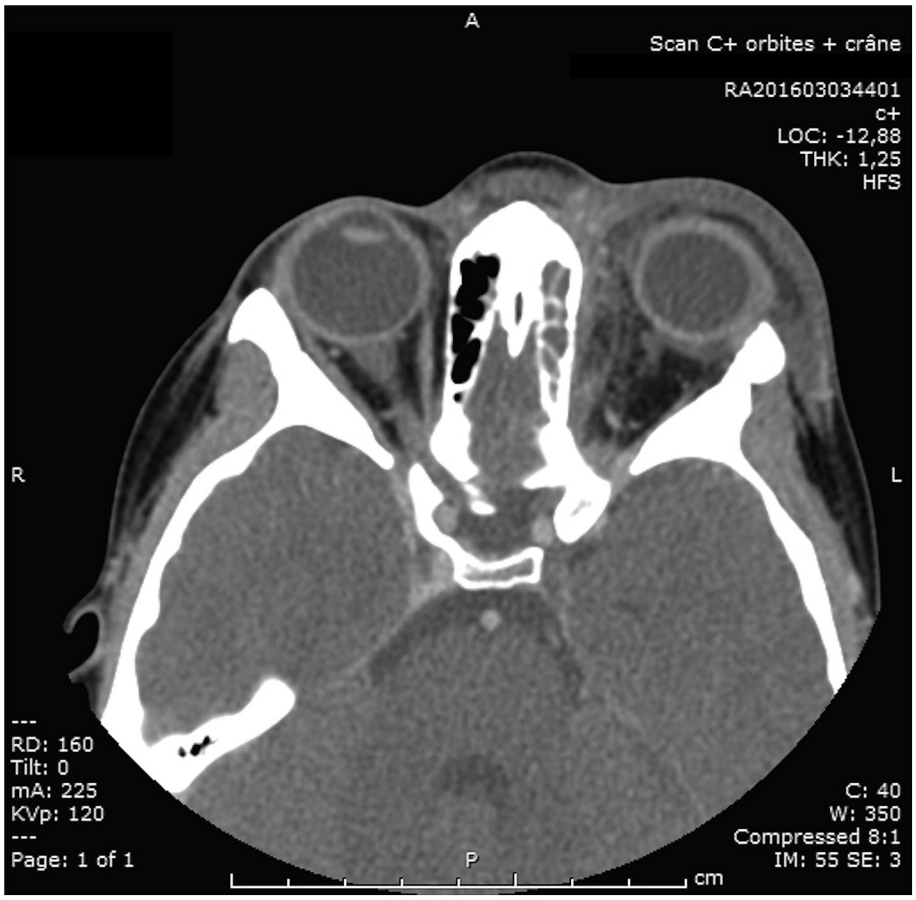

Fig. 4. Patient 2 at presentation. Orbit computed tomography showing left ethmoidal sinustitis with a 5.7-mm-thick intraorbital phlegmon adjacent to the left lamina papyracea. In addition, the left proptosis and the orbital fat infiltration are all consistent with a left orbital cellulitis associated with a medial-wall phlegmon.

sinusitis and a 5.7-mm-thick phlegmon of the lamina papyracea accompanied by medial rectus and superior oblique muscle inflammation (Fig. 4). Blood, nasal and throat cultures were negative and nasal endoscopy did not show structural abnormalities. The patient responded well to intravenous cefotaxime and clindamycine and was discharged after 11 days of hospitalization.

Upon further questioning of the parents it was discovered that the first patient's twin brother had previously presented fever and right eyelid edema. He never developed orbital involvement nor required in-hospital care, but a throat swab was positive for group A beta-hemolytic streptococcus that was treated with penicillin. No member of the family had a history of frequent, recurrent or unusual infections. The parents were treated with penicillin prophylactically.

3. Discussion

We report an unusual case of family transmission of *S pyogenes* infection that resulted in orbital cellulitis of two siblings, in absence of anatomical or immunological predisposing factors. This highlights the importance of early diagnosis and treatment of *S pyogenes*, and the role of throat cultures even in the absence of symptoms or signs of pharyngitis.

4. Patient consent

Written consent to publish personal information and case details has been obtained from the patients' parents (legal guardians). The parents agreed to the publication of the illustrations included in this document as well as the full text.

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Conflict of interest

The following authors have no financial disclosures: EG, CD.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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