CASE REPORT

Odontogenic abscess mimicking acute dacryocystitis

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Accepted 12 April 2017

SUMMARY

A middle-aged poorly controlled diabetic man developed left-sided orbital and facial swelling several days after extraction of a left upper wisdom tooth. The clinical impression was that of acute dacryocystitis. Opening the skin above the lacrimal sac failed to reveal an inflamed sac establishing the diagnosis of deep facial cellulitis. Complete resolution occurred few weeks after systemic antibiotics and repeated dental drainage of the tooth abscess.

BACKGROUND

Acute dacryocystitis presents with sudden onset of swelling, erythema and pain overlying the region of the lacrimal sac region that may extend to the rest of the face in the form of preseptal cellulitis. In severe dacryocystitis, there is bacterial spread into the orbit with orbital abscess formation or orbital cellulitis. Orbital infections may result in permanent ocular morbidity and irreversible visual loss as well as systemic morbidity like cavernous sinus thrombosis if there is delayed diagnosis and treatment.^{1–15} Odontogenic infections can cause maxillary sinusitis with spread of the infection from the root canal apices into the antral and periapical tissues of the maxillary sinus.⁵ Such uncommon complications from odontogenic foci can take a clinically foul-royant course owing to special anatomic proximity of the maxillary sinus to the orbit and hence to the brain.^{4 12} We present such a case that presented with the clinical picture of acute dacryocystitis that turned out to be deep facial cellulitis and our clinical suspicion made us avoid unnecessary surgical damage to the nasolacrimal apparatus.

CASE PRESENTATION

This 59-year-old Caucasian high executive man presented with a high fever (38.5°C) and left cheek swelling with erythema 1 day after extraction of the wisdom tooth. He was started outside on intravenous piperacillin/tazobactam for 3 days with worsening of the facial swelling. The patient had poorly controlled diabetes mellitus of 20 years, systemic hypertension, coronary artery disease with previous coronary bypass surgery and controlled proliferative diabetic retinopathy. On admission, physical examination (figure 1) and radiography (figure 2) established the diagnosis of tooth abscess and he was initiated on vancomycin, clindamycin and piperacillin/tazobactam. Two days later, ultrasound-guided drainage of the abscesses succeeded only partially. Culture of the discharge revealed *Enterococcus* sensitive to penicillin and he was

maintained on intravenous vancomycin only, then amoxicillin–clavulanate. Uncorrected visual acuity was 6/7.5 bilaterally with inactive proliferative diabetic retinopathy. Motility examination and pupillary responses were normal with absent proptosis. There was absence of tearing or purulent discharge on pressure on the lacrimal sac area. Our preliminary diagnosis was acute dacryocystitis versus deep facial cellulitis (figure 1). The plan was to incise the infected lacrimal sac. In the operating room 2 days after admission, incision of the medial canthus overlying the sac revealed a nondistended, noninflamed sac. The incision was left open and no attempt was done to incise the sac. The post-operative diagnosis was deep facial cellulitis. Subsequently, purulent discharge was self-expressed (figure 1). Drainage of the tooth abscess was also done successfully by the otolaryngology team 5 days after admission. The facial swelling decreased gradually, as well as the medial canthal discharge (figure 1). He was discharged on oral amoxicillin clavulanate for 2 weeks. There was complete resolution of the facial and periorbital inflammation few weeks later (figure 1). The patient had recurring cystoid macular oedema and underwent bilateral intravitreal ranibizumab injections 3 months after hospitalisation.

INVESTIGATIONS

On admission, complete blood count revealed leukocytosis of 16 200 with 79% neutrophils. CT face imaging (on admission) (figure 2) and MR face imaging (figure 3) (2 days after admission) revealed left facial swelling extending from the submandibular space to the left cheek compatible with cellulitis. MR scan showed abnormal enhancement with multiple septate and loculated collections in the left mandible up to the maxillary region with evidence of two small fluid collections, the largest measuring 1.3 cm. Also, there was lucency around the root of the left third molar tooth which is in keeping with dental abscess (figure 3). The soft tissue swelling extended superiorly to the left cheek, left nasolacrimal sac and around the left orbit and eyelids with an unremarkable orbit (figure 2).

DIFFERENTIAL DIAGNOSIS

Mucormycosis in a poorly controlled diabetic patient needs to be ruled out. However, the temporal relation to the dental procedure shifted the diagnosis towards odontogenic abscess with maxillary sinusitis and deep facial cellulitis. Acute dacryocystitis can lead to orbital cellulitis but usually presents with tearing and purulent discharge from the lacrimal punctae on pressure on the lacrimal

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To cite: Mansour AM, Kheir-Jurdi W, Hadi UE, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2016-218560

Figure 1 External appearance on presentation with left facial swelling (A), 3 days later with severe medial canthal erythema and swelling (B), 5 days later pus is draining from the medial canthal area mimicking acute dacryocystitis (C). There was a complete resolution of erythema and swelling of the left face a month later (D).

sac. Differential diagnosis of orbital cellulitis includes preseptal cellulitis and subperiosteal abscess.¹⁶ CT is essential in establishing the diagnosis of odontogenic abscess (periapical lucency, widening of periodontal ligament space, presence of subperiosteal abscess).^{13 17}

TREATMENT

Intravenous antibiotics,⁵ drainage of the tooth abscess and passive drainage of deep facial cellulitis allowed control of the disease without cosmetic blemish.

OUTCOME AND FOLLOW-UP

The patient recovered fully 1 month after presentation.

DISCUSSION

Acute dacryocystitis usually induces preseptal cellulitis and rarely the infection does extend from the sac to the orbital contents resulting in orbital cellulitis.¹⁸ In the current case, the otolaryngologist advised repeatedly draining the lacrimal sac and the external appearance was for a dacryocystitis. Absence

Figure 2 Axial CT of the orbit reveals swelling around the lacrimal sac on the left side with normal orbits (A) with severe tissue swelling around the left upper jaw and abscess formation on coronal view (B).

Figure 3 MR face with contrast. (A) Soft tissue swelling around the left lacrimal sac. (B and C) Left facial swelling extending from the submandibular space to the left cheek, with multiple septate and loculated collections (red arrows). The lucency around the root of the left third molar is in keeping with a dental abscess (black arrow).

of tearing and pus regurgitation on pressure on the lacrimal sac favoured the diagnosis of deep fasciitis and this was documented on inspection of the sac intraoperatively.

A multidisciplinary approach is needed in managing subjects with this condition,¹⁻¹⁵ with a (1) vital signs with temperature chart; (2) full blood count; (3) repeated dental drainage of any pus collection; (4) otolaryngology consultation to assess severity of sinus infection; (5) comprehensive daily eye examination (motility, pupillary reaction, disc swelling, proptosis and visual acuity) and (6) CT scan of orbits and sinuses.⁶ The therapy should be adjusted to the differential diagnosis, which is important in making a diagnosis and deciding on the treatment options. Orbital cellulitis often responds to antibiotics. Moreover, preseptal cellulitis almost always responds to antibiotics alone. Severe orbital or subperiosteal abscesses usually present with proptosis, ophthalmoplegia and visual loss requiring emergency drainage based on clinical and CT findings.^{1 16 17}

The current case was odontogenic abscess with deep facial cellulitis and preseptal cellulitis with intact globe function that responded to medical and dental surgery without the need for orbital intervention or lacrimal sac incision. However, in this particular case, initial failure to respond to piperacillin/tazobactam at an outside hospital, presence of uncontrolled diabetes mellitus and the fulminant course led to the addition of vancomycin and clindamycin, for fear of the potential complications or resistant Gram-positive infection. De-escalation was done once the culture results became available.

Learning points

- ▶ Odontogenic abscess needs prompt diagnosis and emergency treatment regimen as delay in care can lead to permanent visual loss from orbital cellulitis and to systemic complications such as cavernous sinus thrombosis.
- ▶ Odontogenic abscess can present as dacryocystitis-like picture from deep facial cellulitis.
- ▶ Multidisciplinary approach is crucial for the avoidance of complication from odontogenic abscess.
- ▶ Daily monitoring of medical therapy for orbital swelling in odontogenic abscess for impending orbital cellulitis together with repeated drainage of the tooth abscess can prevent the occurrence of orbital abscess and the need for orbital surgery.

Contributors All four authors AMM, WK-J, GA and UEH have contributed towards acquisition of data (each in his different specialty: UEH for surgery and Otolaryngology findings, GA for medical and antibacterial therapy and both AMM and WJK for the ophthalmic therapy), drafting of different sections of the article (each in his own specialty: GA wrote the antibacterial therapies, UEH the sinus CT

findings and surgery done on the tooth abscess, AMM and WK-J wrote the case report related to ophthalmology, AMM wrote the discussion and put the references). All four authors helped in revising the whole paper draft, did final approval of the submitted version and agreed to be accountable for the whole content of the article.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES

- 1 Bizakis JG, Papadakis CE, Prassopoulos P, et al. Transantral evacuation of an orbital abscess following a molar tooth extraction. *Am J Otolaryngol* 1997;18:277–9.
- 2 Allan BP, Egbert MA, Myall RW. Orbital abscess of odontogenic origin. case report and review of the literature. *Int J Oral Maxillofac Surg* 1991;20:268–70.
- 3 Youssef OH, Stefanyszyn MA, Bilyk JR. Odontogenic orbital cellulitis. *Ophthal Plast Reconstr Surg* 2008;24:29–35.
- 4 Subramaniam S, Min Tet C, Hazabbah Wan Hitam W, et al. Orbital apex syndrome after tooth extraction in an immunocompromised patient. *Int J Ophthalmol* 2011;4:112–4.
- 5 Bullock JD, Fleishman JA. The spread of odontogenic infections to the orbit: diagnosis and management. *J Oral Maxillofac Surg* 1985;43:749–55.
- 6 Caruso PA, Watkins LM, Suwansaard P, et al. Odontogenic orbital inflammation: clinical and CT findings-initial observations. *Radiology* 2006;239:187–94.
- 7 Henry CH, Hughes CV, Larned DC. Odontogenic infection of the orbit: report of a case. *J Oral Maxillofac Surg* 1992;50:172–8.
- 8 Koch F, Breil P, Marroquin BB, et al. Abscess of the orbit arising 48 h after root canal treatment of a maxillary first molar. *Int Endod J* 2006;39:657–64.
- 9 Wysluch A, Maurer P, Ast J, et al. Orbital complications due to an acute odontogenic focus in a child. A case report. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 2009;107:e39–e42.
- 10 Stübinger S, Leiggener C, Sader R, et al. Intraorbital abscess: a rare complication after maxillary molar extraction. *J Am Dent Assoc* 2005;136:921–5.
- 11 Tavakoli M, Bagheri A, Faraz M, et al. Orbital cellulitis as a complication of mandibular odontogenic infection. *Ophthal Plast Reconstr Surg* 2013;29:e5–e7.
- 12 Udaondo P, Garcia-Delpech S, Díaz-Llopis M, et al. Bilateral intraorbital abscesses and cavernous sinus thromboses secondary to *Streptococcus milleri* with a favorable outcome. *Ophthal Plast Reconstr Surg* 2008;24:408–10.
- 13 Caruso PA, Watkins LM, Suwansaard P, et al. Odontogenic orbital inflammation: clinical and CT findings-initial observations. *Radiology* 2006;239:187–94.
- 14 Choe CH, Eckstein LA, Vagefi MR. Orbital inflammation after dental procedures. *Ophthal Plast Reconstr Surg* 2012;28:e113–e115.
- 15 Sakkas N, Schoen R, Schmelzeisen R. Orbital abscess after extraction of a maxillary wisdom tooth. *Br J Oral Maxillofac Surg* 2007;45:245–6.
- 16 Goldberg F, Berne AS, Oski FA. Differentiation of orbital cellulitis from preseptal cellulitis by computed tomography. *Pediatrics* 1978;62:1000–5.
- 17 Le TD, Liu ES, Adatia FA, et al. The effect of adding orbital computed tomography findings to the Chandler criteria for classifying pediatric orbital cellulitis in predicting which patients will require surgical intervention. *J Aapos* 2014;18:271–7.
- 18 Kikkawa DO, Heinz GW, Martin RT, et al. Orbital cellulitis and abscess secondary to dacryocystitis. *Arch Ophthalmol* 2002;120:1096–9.

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