Clinical records

Orbital cellulitis

By David R. Amies (Ely)

Orbital cellulitis, a potentially lethal condition is rarely seen nowadays. It is caused by infection spreading from the neighbouring sinuses in 70–80 per cent of cases. In the adult, the frontal sinus is most frequently the source, whereas in childhood spread from the ethmoid sinuses is more common (Sorsby, 1963). Other causes of orbital cellulitis are: scarlet fever, erysipelas (Sorsby, 1963), following penetrating injury, in association with dental abscesses, middle ear disease and in intracranial infections (Duke-Elder, 1952). Cases of orbital cellulitis following strabismus surgery are occasionally recorded (von Noorden 1972).

Two cases of orbital cellulitis associated with frontal sinusitis occurring in British Servicemen serving in the Middle East are reported. These cases had widely differing outcomes in spite of prompt, energetic and similar therapy.

Case reports

Case 1

This 23-year-old white soldier had a previous history of sinus disease and had had a submucous resection of the nasal septum and antral washouts several years earlier. He was admitted to hospital complaining of severe pain over the right eyebrow which had come on suddenly 24 hours earlier while he was gardening. On admission he was photophobic and in a very distressed and overwrought state. Shortly after admission gross oedema of the right orbital tissues and eyelids developed. There was conjunctival chemosis and exquisite tenderness over the right frontal sinus. The rest of the ocular examination was normal and the ocular fundi were noted to be unremarkable. Temperature 104 °F. Physical examination normal. X-rays of the orbits and sinuses showed a fluid level in the right frontal sinus (Figs. 1 and 2). A diagnosis of right-sided frontal sinusitis with secondary orbital cellulitis was made. Ampicillin 1 gm. six-hourly intramuscularly was begun.

By the following day, the condition had worsened and the patient was in a very toxic condition. The chemosis and proptosis had increased (Fig. 3). The cornea remained bright; pupillary reactions were brisk and the fundi unchanged. Formal testing of vision was precluded because of the general condition. An Otological opinion was obtained and nasal decongestants were prescribed, in an attempt to effect drainage of the frontal sinus. An intravenous drip of Hartmans solution 500 ml. every four hours containing 1 gram of ampicillin, was administered.

Nasal swabs grew normal flora; conjunctival swabs grew staphylococcus albus. Haematology: Hb. 13·8 gm./100 ml., W.B.C. 17,500 mm.^{3} neutrophils

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82 per cent, lymphocytes 16 per cent. E.S.R. 25 mm./1 hour. Thrombotest 103 per cent coagulation activity.

On the third day, clinical improvement appeared to take place. The patient reported no disturbance of vision. Cloxacillin 500 mgms., four-hourly was added to each 500 ml. of Hartman's solution.



FIG. 1

Case 1. X-ray, occipito mental view showing fluid level in right frontal sinus, soft tissue swelling of the right orbit, nasal septum deflected to the right and thickening of the lining membrane of the maxillary sinuses.



FIG. 2

Case 1. X-ray lateral view of the right frontal sinus showing fluid level.

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On the fourth day, the patient reported sudden gross impairment of right vision. There was increased proptosis in a downwards and temporal direction. The right-sided pupillary reactions were sluggish. It was difficult to see the fundus clearly but no gross abnormality was noted. In view of the delay in resolution with antibiotic therapy it was decided to drain the frontal sinus and to explore the orbit. The sinus was opened with a trephine via an incision $\frac{1}{2}$ in. below the medial third of the eyebrow. A small aperture with overlying granulation tissue was found over the floor of the frontal sinus and a small quantity of pus was drained therefrom. The orbit was explored via the same skin incision and three small loculi of pus evacuated. A polythene drain was left *in situ*. A purse string suture was applied to the peri-limbal conjunctiva to secure corneal coverage. Swabs taken from the orbit and frontal sinus at operation grew staphylococcus pyogenes, sensitive to penicillin and cloxacillin.



FIG. 3
Case 1. Proptosis and swelling of upper eyelid.

Post-operatively, Fucidin 500 mgm. 8-hourly by mouth was added to his treatment. Rapid improvement followed and the proptosis lessened. Five days after operation the patency of the fronto-nasal duct was demonstrated using methylene blue solution and the drains were removed.

Outpatient follow-up has shown the development of right-sided optic atrophy, a right divergent squint and minimal right ptosis. The right eye is blind.

Case 2

The second patient was a 24-year-old soldier serving in a remote station in the Persian Gulf who had a four-day history of headache and swelling of the

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right upper eyelid. He complained also of double vision. He was seen by his regimental medical officer who noted right proptosis and conjunctival chemosis. X-ray showed a diffuse opacity in the right frontal region. Orbital cellulitis was diagnosed and treatment commenced with intra-muscular soluble penicillin 2 mega-units and procaine penicillin 2 mega-units. The patient was evacuated by air to the Royal Air Force Hospital at Muharraq, under the care of the general surgical team for treatment.

On arrival, the findings were confirmed. T.101·5 °F. P.84/min. Conjunctival swabs grew staphylococcus pyogenes resistant to penicillin and ampicillin. Treatment was changed to orbenin 500 mgms. 6-hourly. Two days later he was apyrexial. Repeat X-rays (Figs. 4 and 5) revealed an opaque right antrum and a fluid level in the right frontal sinus. On the third day the ophthalmic findings were VR with −4·5 sph.=6/6 VL with −4·0 sph.=6/6. External ocular movements full. No diplopia was elicited. Moderate right ptosis and paresis of the right levator palpebrae superioris and normal brisk and symmetrical pupillary reactions were noted. There was slight swelling of the temporal margin of the right disc. An E.N.T. examination showed pus draining from the right choana. Proof punctu and reantral washout were performed.

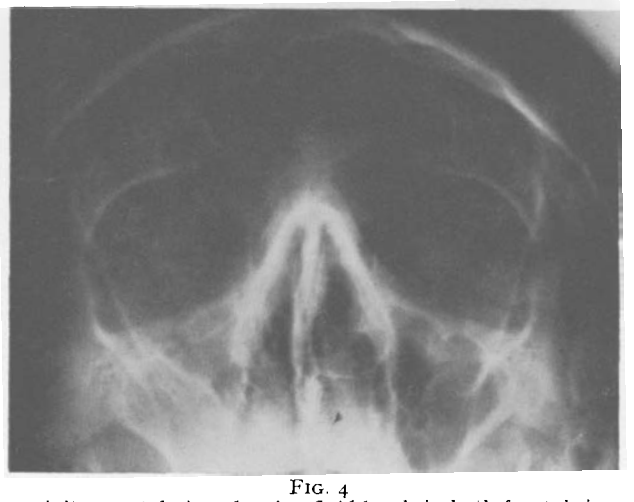


FIG. 4

Case 2. **X-ray** occipito-mental view showing fluid levels in both frontal sinuses and opaque right antrum.

One week later he was evacuated at Princess Mary's Royal Air Force Hospital, Cyprus, and shown to have minimal residual right ptosis, slight injection of the conjunctiva, corrected vision of 6/6 with a full field.

Discussion

These two cases illustrate graphically the widely different outcome possible following orbital cellulitis. The first case was seen and treated in specialist departments early on in his disease process and in spite of energetic antibiotic therapy he lost the vision of his right eye. Resolution did not take place until the orbit was explored. Even so, only small quantities of pus in isolated pockets could be found.

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Cameron advises against early, multiple incisions into the orbit because it is rare to find pus and much of the swelling may well be due to reactionary oedema and incisions will spread the infection. Duke-Elder (1952) points out that marked chemosis of the bulbar conjunctiva and fixation of the globe are indicative of an orbital abscess. Serial testing of the visual fields and assessment of the blind spot to obtain early warning of a threat to vision is impossible to perform on a very sick patient. The mainstay of treatment must be energetic use of antibiotics and active treatment of any extra-orbital causes, e.g. sinusitis. Likewise, he warns against multiple incisions in an attempt to find pus.



FIG. 5

Case 2. X-ray lateral view of the frontal sinuses showing a fluid level.

Vision is presumably lost because of a toxic optic neuritis, thrombophlebitis of the small vessels of the optic nerve, pressure effects on the optic nerve or a combination of all three.

The second case responded well to antibiotic therapy and in spite of his being moved considerable distances by air to obtain specialist treatment, his outcome was entirely favourable and is the one to be expected with modern antibiotic therapy.

Other complications of orbital cellulitis are too well understood to need reiteration. Secondary cavernous sinus thrombosis and meningitis may follow the condition and may prove fatal.

Summary

Two case histories of patients with orbital cellulitis are reported. One lost the vision on the affected side in spite of energetic antibiotic therapy and resolution did not occur until drainage of the orbit was performed. The other case responded favourably to treatment.

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