CASE REPORT

Endogenous endophthalmitis secondary to erysipelas

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Accepted 3 June 2015

SUMMARY

A 64-year-old woman with chronic right arm lymphoedema presented with progressive and painful vision loss in the right eye following diagnosis of erysipelas in the ipsilateral arm. Visual acuity was light perception. Biomicroscopy revealed marked conjunctival injection, decreased corneal transparency and an inflammatory mass in the anterior chamber, which precluded fundoscopy. The ocular ultrasonography features were consistent with acute endophthalmitis, and the patient was admitted to the hospital. A systemic evaluation, including complete physical examination, echocardiography and blood tests, ruled out other sources of infection besides the cutaneous site. Blood cultures were positive for group A *Streptococcus*. A diagnosis of unilateral acute endophthalmitis due to group A *Streptococcus* bacteraemia secondary to erysipelas was made and successfully treated with optimal medical care, including prompt intravitreal and systemic antibiotic administration. Despite resolution of the infectious process, visual acuity did not improve.

BACKGROUND

Endogenous endophthalmitis (EE) secondary to cutaneous infection is a rare occurrence, with about 30 cases found in the literature. Erysipelas is a superficial dermal infectious process that, despite a relatively benign clinical appearance, can lead to septicaemia and endogenous endophthalmitis. Owing to the rare and sight-threatening nature of this disease, we felt obliged to report it. We believe that a cutaneous source of infection should always be sought whenever an endogenous endophthalmitis is suspected, so that timely institution of optimal medical care can be provided to the patients.

CASE PRESENTATION

A 64-year-old woman presented to her general practitioner due to an inflammatory lesion on her right arm, with redness, swelling and well-demarcated borders, compatible with erysipelas (figure 1). She had a history of right mastectomy due to stage IIB breast cancer 24 years before, with secondary chronic lymphoedema of the ipsilateral arm. A non-steroidal anti-inflammatory and oral flucloxacillin were prescribed for the infection.

Four days later, the patient was seen at the ophthalmology emergency room with progressive and painful vision loss in her right eye (OD) associated with redness and tearing. There was no history of trauma, recent ocular surgery or drug abuse. Right arm erysipelas showed no improvement and additional foci of infection had developed in both feet.

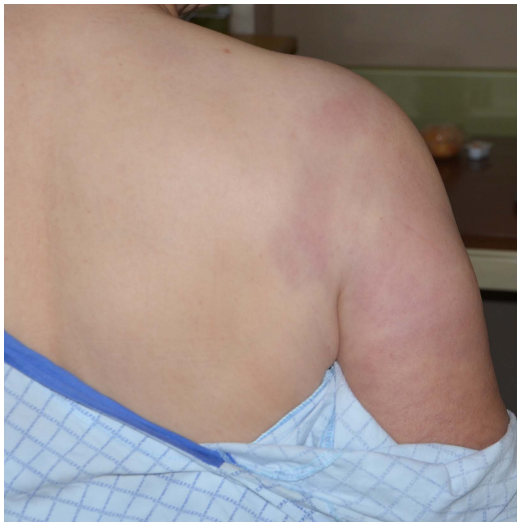

Figure 1 Right arm with a red cutaneous plaque with well-demarcated edges, typical of erysipelas.

The patient was febrile (axillary temperature 38.6°C). Best-corrected visual acuity was light perception OD and 6/6 (Snellen) in the left eye. Biomicroscopy revealed conjunctival injection, corneal oedema and an inflammatory infiltrate in the anterior chamber, along with a mid-dilated non-reactive pupil (figure 2). Fundoscopy was impossible due to decreased media transparency but ocular ultrasonography showed severe vitritis without retinal detachment. Left eye examination was unremarkable.

A diagnosis of acute unilateral endogenous endophthalmitis was made and the patient was admitted to the hospital for medical treatment.

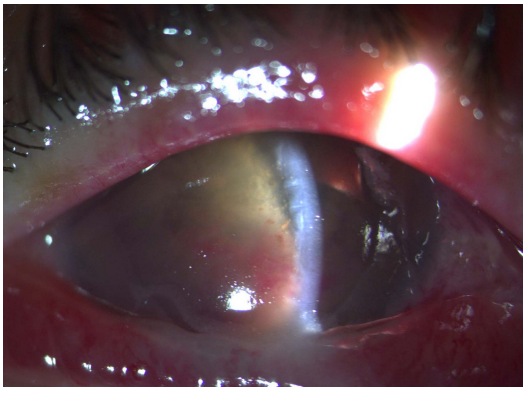

Figure 2 Slit-lamp photograph of the right eye on admission.

To cite: Costa JF, Marques JP, Marques M, *et al*. *BMJ Case Rep* Published online: [*please include* Day Month Year] doi:10.1136/bcr-2014-209252

INVESTIGATIONS

A multidisciplinary approach was used to identify possible sources of infection besides erysipelas. The patient was fully evaluated by a team of cardiologists, dermatologists and infectologists. Blood tests showed leucocytosis (25.1×10^9/L) and elevated C reactive protein (339.3 mg/L). Chest X-ray, ECG and abdominal ultrasound were unremarkable, and no signs of endocarditis were found on echocardiography. Urine, vitreous and anterior chamber tap cultures found no causative agent. Three days after admission, blood cultures grew group A *Streptococcus*.

TREATMENT

Immediately after admission, the patient underwent intravitreal injections of vancomycin (1 mg in 0.1 mL) and ceftazidime (2 mg in 0.1 mL). Owing to an initial poor clinical response, this procedure was repeated 48 h later. Hourly fortified topical tobramycin and vancomycin were used, along with endovenous meropenem (1 g q8h). Owing to corneal oedema it was not possible to safely perform an adjuvant pars plana vitrectomy. Antibiotic susceptibility testing of the isolated Group A streptococci showed sensitivity to meropenem, so the antibiotic regimen was continued for 14 days and no further intravitreal antibiotics were administered.

OUTCOME AND FOLLOW-UP

Daily re-evaluation showed slow improvement of the cutaneous infection, along with gradual resolution of the intraocular inflammatory signs after 72 h of antibiotherapy. Erysipelas remained the only recognisable source of septicaemia. One month after discharge, the patient was asymptomatic. The cornea was opaque and *rubeosis iridis* was noted, but there was no intraocular hypertension. Persistent vitreous condensations precluded fundus visualisation. Best-corrected visual acuity remained light perception. The patient refused pars plana vitrectomy and penetrating keratoplasty, and was later lost to follow-up.

DISCUSSION

Endophthalmitis is one of the most feared disorders in ophthalmology. It is an inflammatory condition of the eye due to an intraocular infectious process caused by bacteria, fungi or, rarely, parasites. It can be classified as exogenous or endogenous depending on the underlying physiopathological mechanism. Exogenous endophthalmitis, the most common of the two, arises due to a disruption of the external ocular barriers following trauma or surgery. In contrast, EE stems from haematogenous spread of pathogens and represents 2% to 5% of all cases.[1]

The microbial spectrum of endophthalmitis depends on the cause, geographic location and population studied. In the Western population, coagulase negative staphylococci and *Streptococcus viridans* are the most commonly isolated microorganisms in exogenous endophthalmitis. This is in contrast with endogenous cases, where *Aspergillus* species and *Staphylococcus aureus* are the most frequently recognised causative agents. β-haemolytic streptococci, which include group A *Streptococcus*, are a rare cause of both endogenous and exogenous endophthalmitis, accounting for 2.6% of all cases.[2]

Risk factors for the development of EE are mainly related to immunosuppression or to procedures that increase the risk for blood-borne infections. The most common factors include immunosuppressive diseases, such as diabetes mellitus, HIV infection and cancer, major surgery, indwelling intravenous catheters and intravenous drug abuse.[3] Persistent or transient septicaemia can be due to a myriad of conditions. The most common extraocular foci of infection are liver abscesses, pneumonia, endocarditis and soft tissue and urinary tract infections. There are about 30 reported cases of EE secondary to tissue infections, most commonly skin and wound infections, cellulitis, necrotising fasciitis and myositis.[1]

Lymphoedema is an abnormal accumulation of protein-rich interstitial fluid, resulting in oedema formation and eventually in chronic inflammation.[4] In the present case, the patient presented chronic secondary lymphoedema resulting from mastectomy with adjuvant axillary lymph nodes dissection due to breast cancer. Lymphoedema is a major risk factor for the development of erysipelas, an infection of the dermis and dermal lymphatics commonly caused by streptococcal species, usually group A streptococci.[5] Clinically, it manifests as a fiery red, painful plaque with well-demarcated edges. Once the aetiological agent has broken through the skin, there are no anatomical boundaries limiting its spread through the cutaneous and subcutaneous tissue. Further resistance to haematogenous spread of infection depends on the innate and adaptive immune responses of the host.[6] Blood cultures are positive in 4.6% of patients with erysipelas. Streptococcal species are the predominant organism identified, constituting 75% of the isolates from positive blood cultures (46% group A and 29% non-group A).[7] Accordingly, in this case, group A streptococci bacteraemia was found. Once in the bloodstream, this microorganism may cross the blood-retinal barrier and access the intraocular structures.

The functional prognosis of EE has not improved in the past decades despite a better understanding of its physiopathological mechanisms. Only 29% of patients present a final visual acuity better than counting fingers, while 24% have no light perception.[1] Not surprisingly, even with early recognition, and prompt intravitreal and systemic antibiotic administration with resolution of the infectious process, the visual outcome in our patient was poor.

To the best of our knowledge, this is the second reported case of acute endophthalmitis secondary to erysipelas. Paquier-Vallete *et al*[8] described a 57-year-old man in whom endophthalmitis was secondary to *Streptococcus agalactiae* septicaemia due to erysipelas in the left lower limb. As in our case, the patient was treated with intravitreal ceftazidime and vancomycin. Systemic antibiotherapy consisted of imipenem and levofloxacin. The authors reported complete visual recovery after 1 month of follow-up.

In conclusion, a multidisciplinary approach to EE is of the utmost importance so that an occult source of infection is not overlooked. Cutaneous infection, although an extremely rare cause of EE, should be kept in mind when managing these cases. Despite prompt and aggressive treatment, the visual outcome remains poor.

Learning points

- Patients with systemic infection who develop visual symptoms attributable to endogenous endophthalmitis should be promptly evaluated by an ophthalmologist.
- Endophthalmitis secondary to cutaneous infection is a rare occurrence but should be kept in mind when no other sources of infection can be found.
- A multidisciplinary approach is of paramount importance when managing endogenous endophthalmitis.
- Despite optimal medical care and early recognition, the visual prognosis is usually poor.

Contributors JFC and JPM wrote the case report. MJQ and MM contributed to the discussion and reviewed the paper.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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