

## **Endophthalmitis, *Clostridium Septicum* Bacteraemia and the Search for Colonic Malignancy**

S. Quill, N. McEvoy, A. Gabr, G. Govender, O. Ali  
St. James's Hospital, Dublin, Ireland.

### **Abstract**

#### **Presentation**

An 86-year-old man presented with a four-day history of subjective fevers and malaise. He developed a mucopurulent discharge from his right orbit, a corneal injection and a hypopyon shortly after admission.

#### **Diagnosis**

Endogenous endophthalmitis, secondary to *Clostridium septicum* bacteraemia.

#### **Treatment**

Topical, intravitreal and systemic antibiotics & right-sided tarsorrhaphy.

#### **Discussion**

This case highlights the ophthalmic complications of *Clostridium septicum* bacteraemia, as well as the rapidity of disease progression and the poor visual prognosis seen in *Clostridium septicum* endophthalmitis. It also reminds physicians of the association between *Clostridium septicum* bacteraemia and underlying malignancy, and with mycotic aortic aneurysms.

### **Introduction**

Endogenous endophthalmitis is an intraocular infection caused by haematogenous seeding of microorganisms from a distant source<sup>1</sup>. Cases of endogenous endophthalmitis are most commonly described in association with infective endocarditis and liver abscesses<sup>1</sup>.

## Case Report

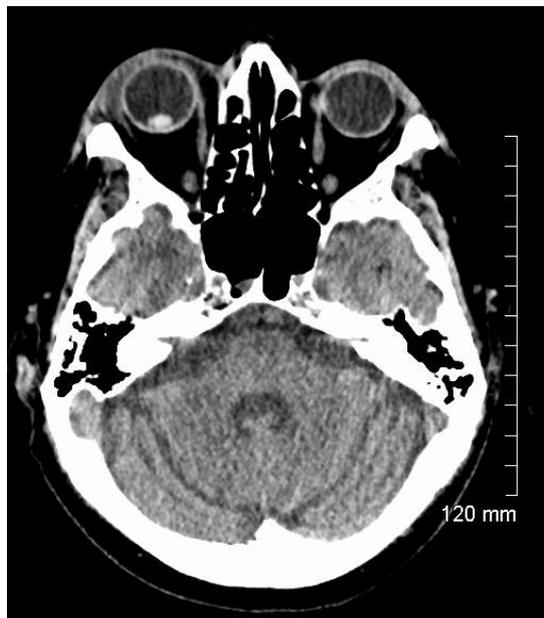
An 86-year-old man presented with a four day history of subjective fevers and malaise on a background of ischaemic heart disease, stage IV chronic kidney disease and intractable iron-deficiency anaemia. He was pyrexial (38.4°C) and tachycardic (100 beats per minute) on admission. The rest of his vital signs were within normal limits.

Preliminary laboratory investigations included; white cell count; 8.5 (3.5-10.5x10<sup>9</sup>/L), neutrophils 8.0 (1.70-7.00x10<sup>9</sup>/L) lymphocytes 0.1 (0.90-2.90x10<sup>9</sup>/L), C-Reactive Protein 220 (<3mg/L), haemoglobin 7.3 (14-18 mg/dL). Abdominal exam on admission was unremarkable.

In the first 12 hours of his hospital admission, the patient experienced a deterioration in visual acuity in his right eye from 6/6 vision to no light perception. Over the same time-period, the patient developed right periorbital swelling, right eye ophthalmoplegia and corneal injection with associated mucopurulent discharge. He denied right eye pain.

A single set of blood cultures was taken prior to commencing empiric antibiotic therapy with IV co-amoxiclav and PO clarithromycin. The gram-positive bacillus, *Clostridium septicum*, was grown in the anaerobic blood culture bottle of this first set. No definite antimicrobial sensitivities were obtained in the laboratory. All other blood culture bottles displayed no growth. After discussion at the microbiology multidisciplinary team meeting, he was commenced on systemic metronidazole (500mg, IV, TDS), ceftriaxone (2g, IV, OD) & daptomycin (560mg (6mg/kg), IV, OD). Computed tomography (CT) of the orbits indicated right-sided periorbital oedema and posterior dislocation of the lens in the right eye (Fig. 1). Slit lamp examination of demonstrated a hypopyon of the right eye.

**Fig. 1 CT Orbits:** CT orbits demonstrating right-sided periorbital oedema and posterior dislocation of the right lens.

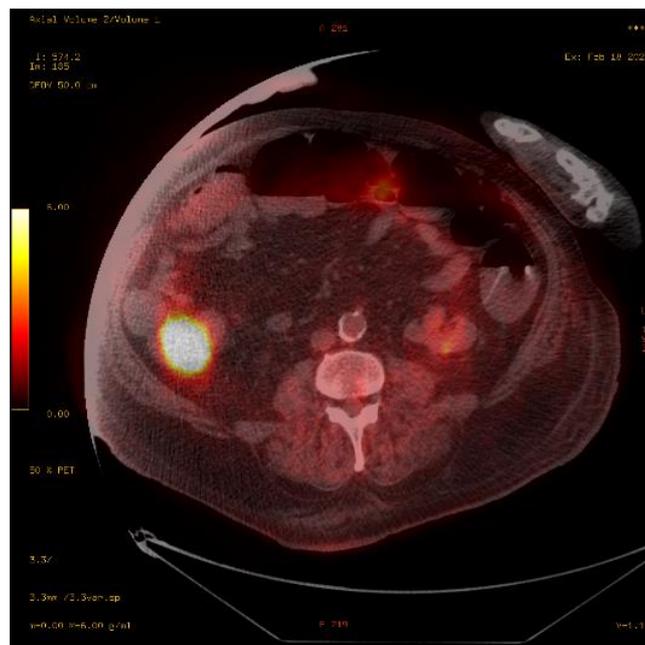


48 hours after initial presentation, a corneal abscess had developed and a new, right-sided relative afferent pupillary defect was noted. Intraocular pressures remained normal. The decision was made for referral to a specialist ophthalmology centre for urgent management of endophthalmitis.

Unfortunately, despite administration of topical (ceftazidime: 50mg/mL, 1 drop, hourly; vancomycin: 50mg/mL, 1 drop, hourly) & intravitreal (vancomycin 2mg, ceftazidime 2mg, dexamethasone 0.4mg) therapy, the patient developed an infected corneal-scleral ring, eventually precipitating a perforated right globe. He declined evisceration of the right eye and elected to undergo a total tarsorrhaphy. No growth was seen on vitreous culture.

The suspected source of the bacteraemia was eventually revealed by positron emission tomography (PET) CT imaging, which showed a likely new diagnosis of a right-sided colonic malignancy (Fig. 2). However, the patient declined biopsy of this colonic mass.

**Fig. 2 PET CT abdomen:** PET CT showing intense 5-FDG avidity in the right colon.



During the workup for malignancy as the source for bacteraemia, a CT thorax and subsequent CT angiogram revealed a distended, proximal descending aorta, likely indicating the development of a mycotic aneurysm. This CT angiogram finding was corroborated by the PET CT images, where high 5-FDG avidity was seen in the vessel wall at the area of dilatation and in the surrounding soft tissue.

The patient initially responded to systemic antibiotic therapy but succumbed to a hospital acquired pneumonia 5 weeks after initial presentation. Autopsy was not performed, and no formal tissue diagnosis of malignancy was obtained.

## Discussion

To the best of our knowledge, there have been 9 cases of endogenous *Clostridium septicum* endophthalmitis described to date<sup>2,3-7</sup>.

In the case above, vitreous culture was negative. However, these can be negative in up to 25% of cases of bacterial endogenous endophthalmitis<sup>8</sup>. Furthermore, the patient had already received 3 days of topical and systemic antibiotics.

This case supports previous observations that *Clostridium septicum* endophthalmitis has a poor visual prognosis, typically exhibiting a rapid deterioration of visual acuity within 24 hours of onset of visual symptoms<sup>2,4,6</sup>.

*Clostridium septicum* endophthalmitis may be a presenting feature of an underlying malignancy<sup>2,3,5,6</sup>. In a study carried out by Koranasky, Stargel and Dowell, colon cancer was the most common solid organ malignancy associated with *Clostridium septicum* bacteraemia<sup>9</sup>.

*Clostridium septicum* bacteraemia appears to have a poor overall prognosis<sup>2,4,5</sup>. *Clostridium septicum* mycotic aneurysms have been described in the context of *Clostridium septicum* bacteraemia and colon cancer and contribute to the high mortality rate seen in this patient population. A systematic literature review by Ito et al. reported that the “6-month mortality rate was 100%” in patients with untreated *Clostridium septicum* mycotic aneurysms<sup>10</sup>. Considering the poor visual and overall prognosis of patients with endogenous *Clostridium septicum* endophthalmitis, it is crucial that prompt blood cultures are taken in the context of eye signs and pyrexia in order to prevent delayed diagnoses and potentially suboptimal outcomes.

### Declaration of Conflicts of Interest:

The authors declare no conflicts of interest in preparing this article.

### Corresponding Author:

Dr. Sam Quill,  
St. James’s Hospital,  
Dublin 8,  
Ireland.  
E-mail: [squill@tcd.ie](mailto:squill@tcd.ie)

### References:

1. Ali Sadiq M, Hassan M, Agarwal A, Sarwar S, Toufeeq S, K. Soliman M et al. Endogenous endophthalmitis: diagnosis, management, and prognosis [Internet]. Journal of Ophthalmic Inflammation and Infection 2015 [cited 23 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4630262/>

2. Lindland A, Slagsvold J. Binocular endogenous Clostridium septicum endophthalmitis [Internet]. NCBI. 2007 [cited 25 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/17305750>
3. Fejes I, Dégi R, Végh M. Clostridium septicum gas gangrene in the orbit: a case report. [Internet]. NCBI. 2013 [cited 25 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23203898>
4. Cannistra A, Albert D, Frambach D, Dreher R, Roberts L. Sudden visual loss associated with clostridial bacteraemia [Internet]. NCBI. 1988 [cited 25 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1041459/>
5. Eisenrich J, Herro A, Schmutz M, Nagi K. Clostridium septicum endophthalmitis associated with colon adenocarcinoma [Internet]. Digital Journal of Ophthalmology. 2014 [cited 25 March 2020]. Available from: <http://djo.harvard.edu/site.php?url=/physicians/cr/1903>
6. Mei J, Nomura J, Eichorn K, Novak-Weekley S. A Case of Fulminant Endophthalmitis. [Internet]. NCBI. 2017 [cited 25 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30052832>
7. Lahav M, Whitcup S. A 79-Year-Old Man with Fever, Abdominal Pain, and an Inflamed Right Eye [Internet]. NEJM. 1989 [cited 25 March 2020]. Available from: <https://www.nejm.org/doi/full/10.1056/NEJM198907203210307>
8. Okada A, Johnson R, Liles W, D'Amico D, Baker A. Endogenous bacterial endophthalmitis. Report of a ten-year retrospective study. [Internet]. NCBI. 1994 [cited 25 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/8190467>
9. Koransky J, Stargel M, Dowell V. Clostridium septicum Bacteremia, its clinical significance [Internet]. NCBI. 1979 [cited 25 March 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/420252>
10. Ito F, Inokuchi R, Matsumoto A, Kumada Y, Yokoyama H, Ishida, T et al. Presence of periaortic gas in Clostridium septicum-infected aortic aneurysm aids in early diagnosis: a case report and systematic review of the literature [Internet]. Journal of Medical Case Reports. 2017 [cited 25 March 2020]. Available from: <https://jmedicalcasereports.biomedcentral.com/articles/10.1186/s13256-017-1422-0>