



**Cavernous sinus venous thrombosis secondary to
Streptococcus milleri maxillary sinusitis: An unusual cause
of diplopia and headache**

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7 **maxillary sinusitis: An unusual cause of diplopia and headache**
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21 **Abstract**
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24 Cavernous sinus venous thrombosis is an uncommon condition associated with high mortality
25 rates if not recognized early. Symptoms include, headache, visual loss, ophthalmoplegia,
26 altered consciousness, proptosis and periorbital oedema. High-quality imaging is critical in
27 early diagnosis and successful management. Primary infection, such as sinusitis and possible
28 complications including meningitis should be considered as potential aetiologies of cavernous
29 sinus venous thrombosis, especially in those with a preceding history of localized infection.
30 We present a case of a 50-year old male with a bilateral cavernous sinus venous thrombosis
31 with associated meningitis caused by *Streptococcus milleri*, secondary to maxillary sinusitis
32 and otomastoiditis. He was successfully treated with antimicrobial treatment, surgical
33 drainage and anticoagulation.
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Case presentation

A 50-year old male, with a history of asthma on corticosteroid inhalers, presented with a 2-week history of diplopia and headache. He had been reviewed 3 weeks earlier due to right ear pain and was diagnosed with otitis externa for which he received a one-week course of oral clarithromycin. A week later he developed progressively worsening diplopia and headache.

On examination, at the time of admission, he was alert and orientated with a GCS of 15/15. He was afebrile (36.5^o) but hypertensive (200/100mmHg); observations were otherwise unremarkable. He had marked diplopia, with bilateral VI cranial nerve palsies evident on examination. Hearing in the right ear was reduced and a purulent discharge from the ear was noted. There was mild nuchal rigidity and photophobia. Blood tests revealed 25.7x10⁹/L leucocytes, 21.7x10⁹/L neutrophils and a mildly raised CRP (37g/dL).

Imaging revealed extensive sinusitis with opacification of right maxillary antrum (Fig. C) and bilateral otomastoiditis (not shown). The striking feature in this case however was the finding on MRI brain showed in Fig. A, B, D that revealed the diagnosis.

MRI brain demonstrated bilateral cavernous sinus thrombosis with enhanced and thickened lateral dural walls due to inflammation. Lumbar puncture showed raised opening pressure of 32cm water. CSF had 1,400 white cells (65% polymorphs; 35% lymphocytes), 1.32g/L protein and 3.4mmol/L glucose (serum: 7.4mmol/L). A right-maxillary sinus trochar washout was performed on day 2 eliciting thick pus and from this a culture of *Streptococcus intermedius (milleri)* sensitive to penicillin, but resistant to clarithromycin, was isolated.

Antibiotics empirically commenced on admission were switched to intravenous Ceftriaxone with metronidazole when culture results were available and the patient improved over the first week of therapy. Anticoagulation therapy was started in view of the cavernous venous sinus thrombosis. On day 7, the patient was discharged home to complete a total of 3 weeks IV and 3 weeks oral antimicrobials under the care of the outpatient parenteral antibiotic therapy team.

Discussion

This case shows how high-quality imaging complements early recognition of clinical symptoms and successful management of pyogenic bilateral cavernous sinus venous thrombosis (CSVT) secondary to *S.millieri* maxillary sinusitis and otomastoiditis. Although rare, CSVT mortality rate remains as high as 5%-10% [1]. Causes of cavernous sinus venous thrombosis include, infection, malignancy, thrombophilias and pregnancy. Main symptoms include, headache, visual loss, ophthalmoplegia, altered consciousness, proptosis and periorbital oedema. Management include antimicrobial treatment of primary infections, such as sinusitis and possible complications including meningitis, surgical drainage and full anticoagulation with heparin [2,3]. The main clinical differential diagnosis would be osteomyelitis of the petrous temporal bone which can involve cranial nerves, known as Gradenigo's syndrome, but the imaging is critical in diagnosis in this case and clearly shows cavernous sinus disease.

Conclusion

Cavernous sinus venous thrombosis is an uncommon but serious condition which should be considered in the differential diagnosis of patients who present with headache and ophthalmoplegia of recent onset, especially those with a preceding history of localized infection.

References:

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Keywords: cavernous sinus venous thrombosis; diplopia; ophthalmoplegia; headache; sinusitis

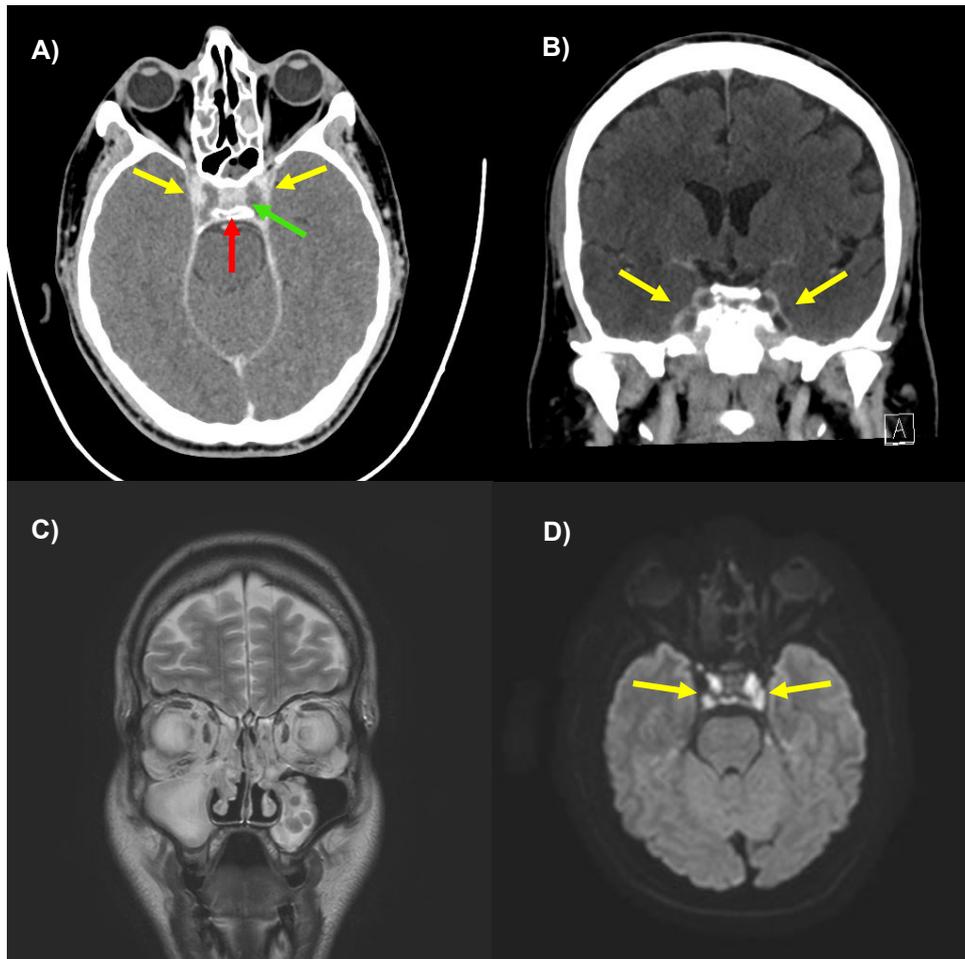
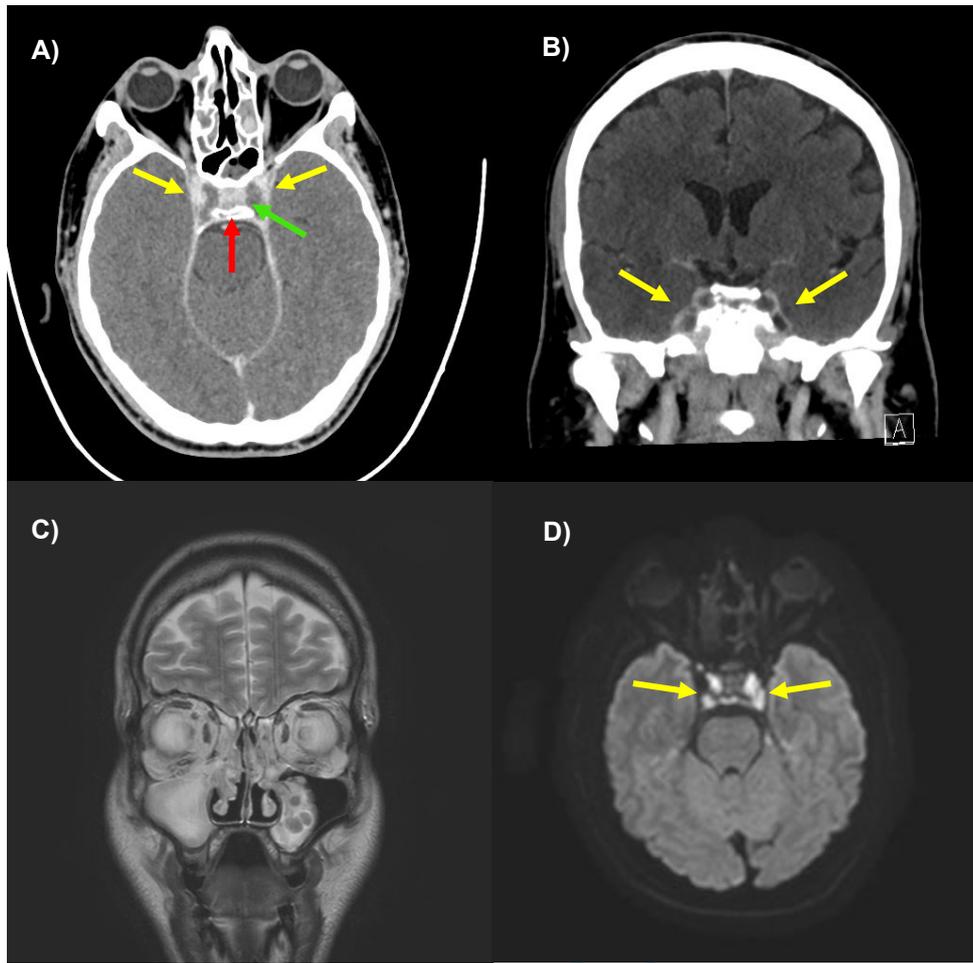


Figure A) *Contrast enhanced axial CT scan.* Both cavernous sinuses are expanded and do not enhance centrally due to thrombus (green arrow). Normal enhancement of the internal carotid arteries (yellow arrows) and pituitary gland (red arrow). **Figure B)** *Contrast enhanced coronal CT scan.* Both cavernous sinuses are expanded and do not enhance centrally due to thrombus. The lateral dural walls are thickened due to inflammation and enhance avidly. **Figure C)** *Coronal T2 weighted MRI scan.* Generalised paranasal sinus mucosal thickening and small nasal polyps. Opacification of right maxillary antrum due to sinusitis. **Figure D)** *Diffusion weighted imaging axial images.* Infected thrombus in the cavernous sinuses (yellow arrows).

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