

# A rare case of methicillin resistant *Staphylococcus aureus* (MRSA) cerebral abscess secondary to conjunctivitis

Gan Yuen Keat, MBBS<sup>1,2</sup>, Annuar Zaki Azmi, MBBS<sup>1</sup>, Shuaibah Abdul Ghani, Ms Ophthal<sup>1</sup>, Amir Samsudin, PhD Ophthal<sup>2</sup>

<sup>1</sup>Department of Ophthalmology, Queen Elizabeth Hospital, Kota Kinabalu, Malaysia, <sup>2</sup>Department of Ophthalmology, Faculty of Medicine, University of Malaya, Malaysia

## SUMMARY

This case report discusses the rare association of cerebral abscess related to conjunctivitis in an otherwise healthy child. A 6 year old boy presented with conjunctivitis was treated with topical antibiotics and resolved after a week. Conjunctival swab cultures grew MRSA. A month later he developed status epilepticus and CT scans revealed a large cerebral abscess. He was treated with intravenous antibiotics which covered for MRSA, along with an incision and drainage for the cerebral abscess. Pus cultures grew MRSA. The patient recovered well with no disturbance in visual acuity or visual field. On post-operative follow ups, he had no other neurological deficit apart from a slight limp.

## INTRODUCTION

Cerebral abscesses secondary to conjunctivitis are rare. To the best of our knowledge this is the first reported case of a methicillin resistant *Staphylococcus aureus* (MRSA) cerebral abscess related to MRSA conjunctivitis in an otherwise healthy child.

## CASE REPORT

A 6-year-old boy of healthcare professionals initially presented with bilateral eye redness with yellowish discharge for two days. On examination, the redness and discharge were more severe on the right eye (Figure 1A and 1B). A right eye conjunctival swab for culture and sensitivity was taken. He was treated for bilateral conjunctivitis with topical ciprofloxacin eyedrops two hourly on the right eye and four hourly on the left eye for a week. At the same time, his mother also noted the development of two small pimples on the nose and one over the philtrum a week after initial presentation (Figure 1C). The pathogens isolated from right conjunctival swab revealed methicillin resistant *Staphylococcus aureus* (MRSA). It was resistant to cloxacillin, penicillin G, and polymyxin B, while sensitive to gentamicin, linezolid, chloramphenicol, rifampicin and trimethoprim-sulfamethoxazole. His conjunctivitis resolved after a week of treatment and he was back to his normal self. However, approximately one month after the conjunctivitis subsided, he developed a generalised tonic clonic seizure lasting for more than 30 minutes, which was arrested by suppository diazepam. He also complained of throbbing frontal headache one day prior to the seizure. There was no history of fever or neurological deficit after seizure. An urgent

computed tomography (CT) scan revealed a large 2.8x2.6x3.4cm ring enhancing lesion at the right temporal region with compression of the ipsilateral lateral ventricle and midline shift to the left measuring more than 0.5cm. (Figure 2) He was started on intravenous (IV) ceftriaxone, metronidazole and vancomycin upon admission. The choice of antibiotic was based on the history of MRSA conjunctivitis in the previous month. He subsequently underwent a right temporal craniotomy and drainage of the abscess. Intra-operatively, a thick wall abscess that adhered to the cerebral tissue was found at the right temporal lobe. Approximately 15ml of pus was drained from the abscess and the capsule was excised in toto with an anterior temporal lobectomy, removing the right middle inferior temporal gyrus about 4cm posterior from temporal bone.

A CT brain was repeated one day post-operatively, showing minimal edema at the right temporo-parietal region with reduction in midline shift. Microbiological examination of the cerebral abscess revealed methicillin resistant *Staphylococcus aureus* (MRSA) with sensitivity similar to the previous conjunctival swab. After consultation with the infectious disease team, the patient was treated for community acquired MRSA infection with IV linezolid for a duration of two weeks.

After two months post-operative, he was well with no impairment in visual acuity and visual field. He has no neurological deficit except for slight limping. This probably due to weakness of the right lower limb.

## DISCUSSION

Methicillin resistant *Staphylococcus aureus* (MRSA) is a rare cause of cerebral abscesses, and it is more common in post-neurosurgical abscesses.<sup>1</sup> The most common causes of brain abscess in children are aerobic and anaerobic streptococci (60 to 70% of cases) followed by gram-negative anaerobic bacilli (20 to 40%), Enterobacteriaceae (20 to 30%), and then *Staphylococcus aureus* (less than 15%).<sup>2</sup>

The incidence of MRSA infection has been increasing over the past decade. This has mainly been attributed to the overuse or misuse of antibiotics and lack of development of new drugs. While health care-associated MRSA (HA-MRSA) has been controlled to some degree via hand hygiene and barrier precautions ( using gloves and gowns), concerns are shifting

*This article was accepted: 9 March 2017*

*Corresponding Author: Gan Yuen Keat*

*Email: ganyuenkeat@gmail.com*

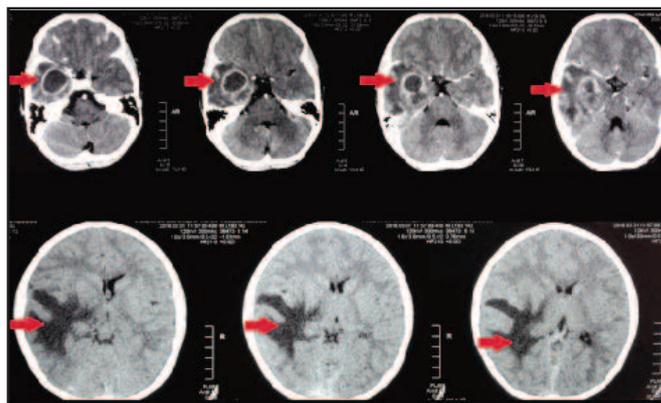


**Fig. 1A & B:** Redness and discharge were more severe on the right eye.

**Fig. 1C:** Two small pimples on the nose and one over the philtrum a week later.

towards the surge in community-associated MRSA(CA-MRSA). Some studies have found that CA-MRSA causes more than half of MRSA soft tissue infections,<sup>3</sup> and an even higher prevalence are found in ocular infections.<sup>4</sup> There are demographic differences in HA and CA-MRSA infection. In comparison with HA-MRSA, patients with CA-MRSA are often young, healthy without any known connection with health care institution. Clusters of CA-MRSA tend to occur in sports teams, military personnel, and prison inmates- There was reported association between CA-MRSA and Panton Valentine leukocidin (PVL)<sup>5</sup> The presence of PVL could prove to be a useful marker for the detection of CA-MRSA in clinical settings. An establishment of active screening for PVL-positive community-acquired (CA)-MRSA and the adoption of new strategies to create effective treatment approaches, while decelerating the progress of resistance should be taken into consideration as a step forward in our battle against MRSA.

In our case, although both the parents are healthcare personnel, a nasal swab from each of the family members were negative for MRSA. Nevertheless, the prompt intervention with potent accurate antibiotic initiation and subsequent surgical removal of the abscess played a key role, possibly responsible for the rapid improvement in his outcome. In spite of this, it is challenging to conclusively prove the relationship between his conjunctivitis and cerebral abscess. We however suspect that the two conditions were directly related due to the similarity in the organism and antibiotic sensitivities from microbiological examination.



**Fig. 2:** Red arrows showing ring enhancing lesion at the right temporal region with midline shift.

**CONCLUSION**

CA-MRSA cerebral abscess secondary to conjunctivitis in a healthy young child is rare. A high index of suspicion with prompt accurate treatment can lead to a good prognosis with minimal morbidity.

**REFERENCES**

1. Sipahi OR, Çağırın I, Yurtseven T, Işıkgöz TM, Arda B, Tünger A, et al. A case of cerebral abscess due to methicillin-resistant Staphylococcus aureus which is treated with linezolid+ rifampin combination. Mikrobiyol. Bul. 2010; 44: 651-5.
2. Sáez-Llorens X, editor Brain abscess in children. Semin. Pediatr. Infect. Dis.; 2003: Elsevier.
3. Rutar T, Chambers HF, Crawford JB, Perdreau-Remington F, Zwick OM, Karr M, et al. Ophthalmic manifestations of infections caused by the USA300 clone of community-associated methicillin-resistant Staphylococcus aureus. Ophthalmology. 2006; 113: 1455-62.
4. Kruger MM, Song J, Blomquist PH. Retrospective Review Of Ophthalmic MRSA Infections From 2005-2009 At Parkland Memorial Hospital. Investigative Ophthalmology & Visual Science. 2011; 52: 1477.
5. Vourli S, Vagiakou H, Ganteris G, Orfanidou M, Polemis M, Vatopoulos A, et al. High rates of community-acquired, Panton-Valentine leukocidin (PVL)-positive methicillin-resistant S. aureus (MRSA) infections in adult outpatients in Greece. Euro Surveill. 2007; 14(2)