

The source reveals the culprit organisms!

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Abstract

This is a case report of a 39 year old female patient with Down's syndrome, who presented to us with right sided hemiparesis and left sided lower motor neuron facial palsy. The past history was significant for left ear pain and discharge during the last 6 months. MRI revealed a brain abscess in the left inferior temporal lobe, the source of which was possibly left chronic otitis media along with mastoiditis. Empirical treatment was given to cover possible causative organisms, anaerobes like *Bacteroides fragilis* and aerobes like *Pseudomonas aeruginosa*. A mastoidectomy was eventually performed which grew *Prevotella bivia* and MSSA (Methicillin sensitive *Staphylococcus aureus*). The patient was successfully treated for 3 months with Inj. Flucloxacillin and Tab. Metronidazole and showed good improvement on follow up.

Keywords

Brain abscess; Chronic otitis media; Mastoiditis; MSSA; *Prevotella bivia*.

Introduction/Background

Brain abscesses can have varied etiologies based on the possible sources of infection. Every attempt to find the organism is needed as empirical therapy is unlikely to be successful. This is a case report of one such patient, for whom the possible source of temporal lobe brain abscess was thought to be otogenic, based on which empirical therapy was given. As it was difficult to obtain brain tissue, a mastoid specimen was obtained which revealed the culprit organisms, for which directed therapy was given and patient improved.

Case Presentation

This is a case report of a 39 year old female patient, who is a known case of Down Syndrome. She presented to us in July 2022 with right sided hemiparesis and left sided lower motor neuron facial palsy.

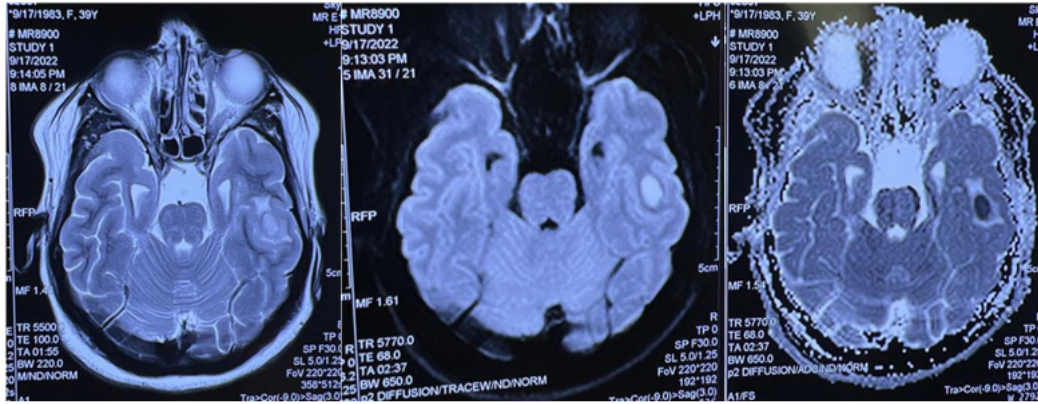


Figure 1: Well defined altered signal intensity lesion measuring 12X8 mm in left inferior temporal lobe- abscess.

Organism Group / Antibiotics	MIC	Interpretation
<i>Staphylococcus aureus</i>	Negative	Susceptible
Cefoxitin Screen	>=0.5	Resistant
Benzylpenicillin	0.5	Susceptible
Oxacillin	<<0.5	Susceptible
Gentamicin	>=8	Resistant
Ciprofloxacin	>=8	Resistant
Levofloxacin	Negative	Susceptible
Inducible Clindamycin Resistance	>=8	Resistant
Erythromycin	0.25	Susceptible
Clindamycin	2	Susceptible
Linezolid	0.25	Susceptible
Daptomycin	<<0.5	Susceptible
Teicoplanin	<<0.5	Susceptible
Vancomycin	<<1	Susceptible
Tetracycline	<<0.12	Susceptible
Tigecycline	<<0.03	Susceptible
Rifampicin	<=10	Susceptible
Trimethoprim Sulfamethoxazole		

Figure 2: Mastoid tissue aerobic culture grew Methicillin Resistant Staphylococcus aureus (MSSA).

REFERRAL ISOLATE ID FOR BACTERIAL BY MALDI TOF

Test	Result
REFERRAL ISOLATE ID FOR BACTERIAL BY MALDI TOF	
SPECIMEN	ISOLATE FROM TISSUE
IDENTIFICATION	PREVOTELLA BIVIA

Figure 3: Mastoid tissue anaerobic culture grew Prevotella bivia, identified by MALDI-TOF MS.

The past history was significant for left ear pain and discharge during the last 6 months. An MRI brain was performed at this point, which revealed a left inferior temporal lobe abscess (Figure 1). An HRCT of the temporal bone also revealed bilateral extensive otomastoiditis.

The brain abscess was likely otogenic in origin. The organisms which were thought to be important to cover empirically were anaerobes such as Bacteroides fragilis, and aerobes such as Pseudomonas aeruginosa [1]. Therefore, the patient was started on Inj. Metronidazole 500 mg TDS and Inj. Meropenem 1g TDS.

Neurosurgical intervention was deferred as the abscess was <2.5 cm [1], instead, a mastoidectomy was performed. The mastoid tissue obtained at surgery was sent for various tests like aerobic and anaerobic cultures, as well as 16s RNA sequencing. The aerobic culture grew Methicillin Sensitive Staphylococcus Aureus (MSSA) (Figure 2) while the anaerobic culture grew Prevotella bivia (Figure 3). The 16s RNA sequencing also revealed the same organisms [6].

Therefore, it was surmised that the organisms producing the brain abscess were the same as those isolated from the mastoid. Inj. Meropenem was replaced with Inj. Flucloxacillin 2 g QID and Metronidazole was continued. The total treatment duration was 3 months. The patient was well on follow up.

Discussion/Conclusion

Brain abscess is a focal infectious collection within the brain parenchyma. It occurs via direct or hematogenous spread, the former being more common [2]. Direct spread can occur from a contiguous site. Subacute and chronic otitis media and mastoiditis produce abscesses in the inferior temporal lobe and cerebellum.

The most common organisms are *Pseudomonas aeruginosa*, anaerobes like *Bacteroides spp*, *Enterobacteriales* and *Streptococcus spp*. Frontal or ethmoid sinuses and dental infections can produce frontal lobe abscesses, and the most common organisms are *Streptococcus spp*, *Haemophilus spp*, *Fusobacterium spp*, etc [3-5]. In general polymicrobial abscesses are more common than monomicrobial likely due to metabolic interactions among the organisms. Location of the abscess throws light on the causative organisms, as it is not always feasible to obtain cultures from the brain abscess before starting treatment. Early involvement of neurosurgeon, for diagnosis (aspiration/biopsy) as well as surgical excision is very useful. Surgical excision should be done in the following cases [7]: traumatic brain abscesses (to remove bone chips and foreign material), encapsulated fungal brain abscesses, multiloculated abscesses, if there is no clinical improvement within one week, depressed sensorium, signs of increased intracranial pressure and progressive increase in the diameter of the abscess. Antimicrobial therapy should be culture guided, although empirical treatment can be given based on likely source of the abscess, etiology, location and patient profile. Duration of treatment is 4-8 weeks at least but needs to be individualized and guided by clinical response and follow up MRI imaging.

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