

## CASE REPORT

# *Aeromonas hydrophila* complicating Postpituitary Surgery for Microadenoma

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## ABSTRACT

We present a rare case of meningitis caused by *Aeromonas hydrophila* that complicated an otherwise successful endoscopic removal of pituitary microadenoma. Review of literature revealed very few cases of meningitis in both immunocompetent and immunocompromised patients. In this case, the patient died within 48 hours of admission despite prompt treatment and extensive resuscitation. This highlights the morbidity and mortality potential of a seemingly harmless organism.

**Keywords:** *Aeromonas hydrophila*, Gram negative bacilli, Meningitis.

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## INTRODUCTION

*Aeromonas hydrophila* (water loving), a gram-negative (GN) bacterium found in fresh and sea water, usually causes infectious diseases in cold blooded aquatic animals. However, these bacteria also reside in sink traps, drain pipes, tap water faucets, and distilled water supplies and can be a potential source of nosocomial infections.<sup>1</sup>

In humans, *Aeromonas* has been found associated with soft tissue infections, gastroenteritis, and septicemia, especially in immunocompromised patients. Skin and soft tissue infections usually occur when such patients are exposed to contaminated water.<sup>2</sup> Rarely, it can cause urinary tract infections, meningitis, hepatobiliary disease, endocarditis, peritonitis, and respiratory tract infections. Its virulence and invasiveness have been attributed to various enzymes and toxins produced by the organism.<sup>3,4</sup>

We, hereby, present a rare case of meningitis caused by *A. hydrophila* complicating postpituitary surgery for microadenoma.

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## CASE REPORT

A 45-year-old female was admitted in the emergency ward of Sri Guru Ram Das hospital, Amritsar, Punjab, India, with symptoms suggestive of meningitis. Physical examination revealed nuchal rigidity and semidilated pupil. She was a magnetic resonance imaging confirmed case of microadenoma of the pituitary gland for which she was operated upon in the same hospital 1 month back; pituitary excision was done and patient was discharged 1 week later in satisfactory condition. However, patient did not turn up for the follow-up.

For her present complaints, a computed tomography scan was done, which also indicated meningitis. Lumbar tap was performed and cerebrospinal fluid (CSF) obtained was sent for cytology, biochemical, and microbiological examinations. The CSF findings are shown in Tables 1 and 2. The patient although initiated on empirical antibiotic therapy as per hospital antibiotic policy died of cardiac arrest and shock within 48 hours of the admission, despite extensive resuscitation.

## Microbiological Examination

Gram staining performed on CSF samples revealed many inflammatory cells. However, no gram positive or GN organisms were seen.

Culture was performed as per standard bacteriological techniques. The CSF was inoculated on 5% blood agar (BA), chocolate agar, and MacConkey's agar (MA) and incubated at 37°C for 24 hours. Sample was also

**Table 1:** Biochemical analysis of CSF

Biochemical analysis	Result (mg/dL)	Normal range (mg/dL)
Protein	144	15–45
Sugar	30	40–70
Adenosine deaminase	2.7	
Globulin	Positive	

**Table 2:** Cytological analysis of CSF

Cytology	Result
Red blood cells	40 cells/ $\mu$ L
Total leucocyte count	10 cells/ $\mu$ L
Differential leucocyte count	
Neutrophils	60%
Lymphocytes	40%

**Table 3:** Culture characteristics

Blood agar	1–3 mm grayish white colonies, circular opaque, smooth with entire margins and a narrow zone of β-hemolysis
MacConkey's agar	Nonlactose fermenting colonies
Chocolate agar	1–2 mm, grayish white, opaque smooth colonies

**Table 4:** *Aeromonas hydrophila* antibiotic susceptibility testing results

Antimicrobial	Interpretation	Antimicrobial	Interpretation
Ampicillin	R	Meropenem	R
Amoxicillin–clavulanic acid	I	Amikacin	S
Piperacillin + tazobactam	R	Gentamicin	S
Cefuroxime	S	Nalidixic acid	R
Cefuroxime axetil	S	Ciprofloxacin	S
Ceftriaxone	S	Tigecyclin	S
Cefoperazone + sulbactam	S	Nitrofurantoin	S
Cefepime	S	Colistin	R
Ertapenem	R	Trimethoprim + Sulfamethoxazole	S
Imipenem	I		

R: Resistance; S: Sensitive; I: Intermediate

inoculated on Sabouraud’s dextrose agar. Growth was observed on all bacteriological media and Gram staining was performed, which showed nonsporing GN bacilli, with no special arrangement (Table 3 shows culture characteristics on BA and MA).

Motility by hanging drop preparation showed motile rods.

### Biochemical Tests

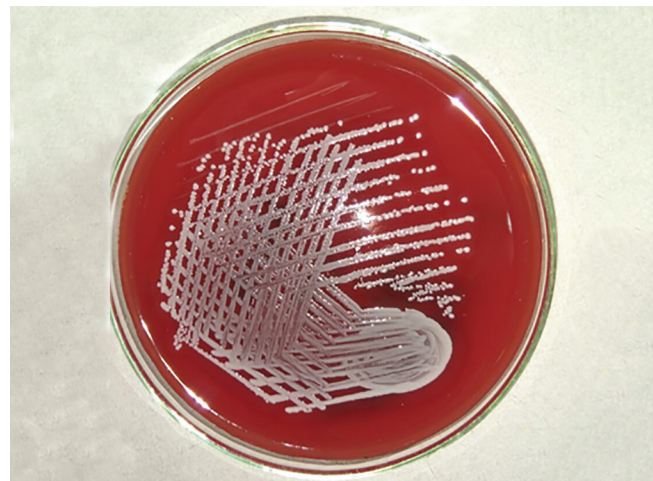
Isolates were catalase test and oxidase test positive.

### Identification and Antimicrobial Sensitivity Testing

Identification (ID) of the isolates and antimicrobial sensitivity testing (AST) were done by Vitek-2 Compact, using GN and AST N 281 cards respectively (Table 4).

### DISCUSSION

Clinical history of this patient shows that the meningitis developed after 1 month of successful endoscopic excision of pituitary microadenoma. The patient landed in the emergency department of the hospital in a semiconscious state with the symptoms suggestive of meningitis. The biochemistry revealed very low levels of cortisol, a life-sustaining adrenal hormone essential to maintaining homeostasis. Its levels are maintained in the body by the



**Fig. 1:** Blood agar plate showing growth of *Aeromonas*

hypothalamus–pituitary–adrenal axis. Further, despite extensive resuscitation, the patient died of shock and cardiac arrest, within 48 hours of admission. We cannot comment whether the patient was having bacteremia since the blood sample was not received for culture. Still, if the patient was also having bacteremia, it could have led to severe sepsis and ultimately shock due to extensive inflammatory response.<sup>5</sup> Salunke et al<sup>6</sup> have reported a case of meningitis caused by *A. hydrophila* culminating in septic shock.

Since the patient did not have any other wound, environmental source of infection seems to be less likely. Meningeal infection could have been a result of surgical procedure done. Since the patient also appeared malnourished with poor general health status, postoperative chemotherapy may have further impaired her immunological response to the opportunistic infections. Qadri et al<sup>7</sup> reported a similar case of meningitis after frontotemporal craniotomy.

*Aeromonas* is a beta-lactamase producer, which makes them resistant to penicillin and first-generation cephalosporins and is showing trends toward increased resistance (Fig. 1).<sup>8</sup> It is usually sensitive to third-generation cephalosporins, imipenem, and flouoroquinolones. However, in this case, it is showing resistance to imipenem and meropenem (Table 4).

### CONCLUSION

*Aeromonas hydrophila* causing CNS infection is an unusual finding. It highlights the importance of being vigilant of new clinical manifestations of well-recognized pathogens. Early and accurate microbiological diagnosis can help initiation of appropriate antibiotic therapy. Further, the probability of infection from hospital environment necessitates strict implementation of hospital infection control.

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