

Unknown CNS Shunt Infection



1 Presentation

A 10 year-old pediatric patient with history of astroblastoma and shunted hydrocephalus with revision 1 month prior, presented with acute altered mental status, fever, nausea and vomiting.



2 Clinical Workup

CSF showed low glucose and elevated protein; Gram stain revealed intracellular Gram-negative bacilli, but negative cultures. A 21-day empiric antimicrobial therapy (meropenem) was initiated. Several days later, MRI showed progression of findings.



3 Delve Detect results

After 5 days without substantial improvement, Delve Detect was ordered. A novel species closely related to *Moraxella bovis* was identified despite a high background of human genomic material. The result was supported by a marked elevation in the relative abundance of *M. bovis* reads compared to background, and by robust alignment of both DNA and RNA sequences to the reference genomes, confirming the specificity and reliability of the result.

K1664

Moraxella closest phylogenetic match

>700x

Relative abundance over background

>100

Unique DNA and RNA reads

94%

Average % identity of reads to reference genomes

4 Clinical Impact



Consultation between Delve's Clinical Microbial Sequencing Board (CMSB) and the treating team included review of clinical context and bioinformatic quality metrics, supporting the validity and clinical significance of the result. Based on these findings, clinicians were reassured that the current therapy, meropenem was sufficient for *M. bovis*, eliminating the need for escalation of therapy or additional interventions or procedures. The patient subsequently demonstrated clinical improvement.

5 Delve Insights



In this culture-negative CNS shunt infection, Delve Detect identified a *Moraxella* species—supported by highly unique sequence reads in both RNA and DNA libraries, and robust genomic coverage—despite prior antibiotic exposure and multiple negative conventional tests. While infections from species like *M. nonliquefaciens* and *M. catarrhalis* have been reported, this novel strain of *Moraxella* has not previously been documented in a CNS infection. This case underscores the limitations of culture-based microbiology and highlights the value of mNGS in detecting fastidious pathogens.



Learn more
about this case!