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CASE REPORT

Infectious Disease

A 54-year-old healthy patient with meningitis and conjunctivitis

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Abstract

We describe a case report of hypermucoviscous *Klebsiella pneumoniae (KP)* promptly diagnosed by blood and cerebrospinal fluid (CSF) culture with positive string test. The patient, without medical history, developed in a few hours multiple localizations, typical of hypervirulent *KP*. Combination of multiple typical localizations (eye, CSF, pulmonary, hepatic) and string test enabled rapid diagnosis of hypermcoviscous and hypervirulent *KP*.

KEYWORDS
bacteremia, endophthalmitis, hypermucoviscous, hypervirulent, *Klebsiella pneumoniae*, liver abscess

1 | CASE REPORT

A 54-year-old patient, without known medical history, was found on the ground by his wife. The patient was Glasgow score 6 with left hemiplegia and left red eye diagnosed as "conjunctivitis." Mechanical ventilation and norepinephrine administration were promptly started. Cerebral computed tomography scan showed only a slow flow in the right middle cerebral artery (Figure 1A). Lumbar puncture showed meningitis: white blood cell count of 171 mm^{-3} with 83% neutrophils, glucose of 15.8 mmol/L for 23.3 in the blood, proteins of 5.27 g/L, and negative direct examination. Two initial blood cultures were taken and antibiotic therapy was promptly started with 200 mg/kg/d of cefotaxim and 30 mg/kg/d aciclovir. Multiple explorations were performed: ophthalmic examination confirmed endophthalmitis (Figure 1B); cerebral magnetic resonance imaging revealed a global cortical venous dilatation, a right frontal recent ischemic stroke, stenosis of the right middle cerebral artery; body scan revealed a multiple pulmonary nodules (Figure 1C) and hepatic abscess (Figure 1D); trans-esophageal echocardiography was normal; a positron emission tomography revealed multiple pulmonary nodules, a hypodense liver lesion, a hyperdense prostatic lesion, and soft tissue abscess of both limbs.

The 2 initial blood cultures were positive in 10 hours. Microbiology laboratory was promptly called to give information on blood and cerebrospinal samples with a *Klebsiella pneumoniae* (*KP*) with a positive string test (Figure 2A). Hypermucoviscous *KP* was diagnosed by positive string test. Multiple localizations were identified: *KP* was cultured on blood samples, urinary sample, hepatic abscess, eye, and soft tissues. *KP* was susceptible to all tested antibiotics except ampicillin (Figure 2B). Association of ofloxacin and cefotaxime was used to treat the patient, especially eye and hepatic localizations. Secondary surgical

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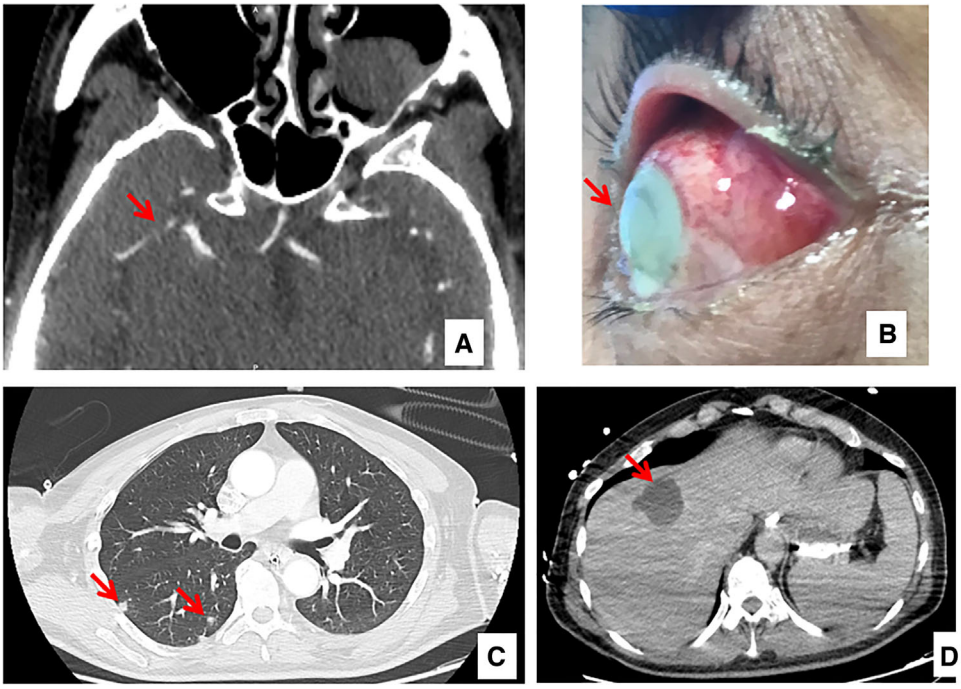

FIGURE 1 Imaging findings. (A) Cerebral computed tomography scan showing a slight right middle cerebral artery (red arrow). (B) Endophtalmitis with white corneal infiltration, pus in aqueous, red eye. (C) Thoracic computed tomography scan showing multiple pulmonary nodules (red arrows). (D) Abdominal computed tomography scan showing liver abscess (red arrow)

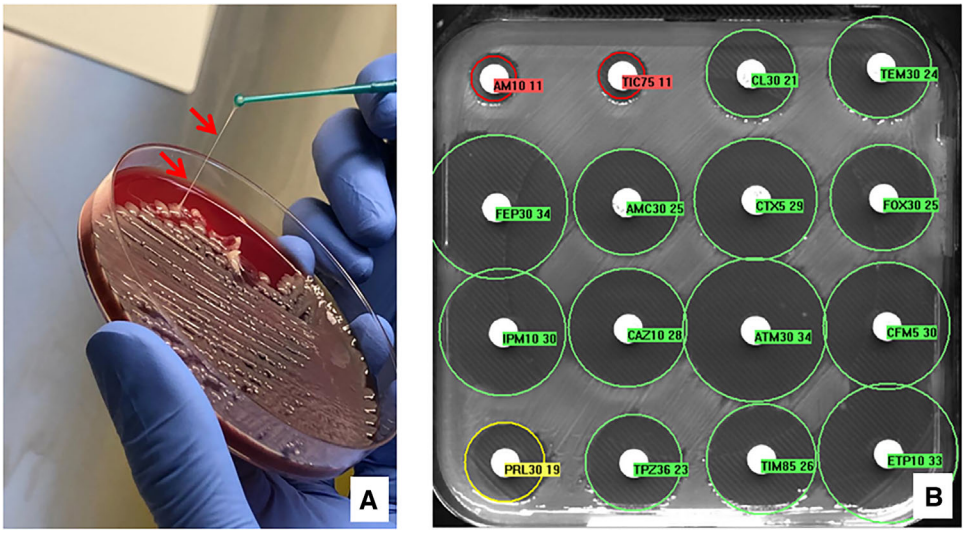

FIGURE 2 Bacteriological data. (A) Presence of "string" strongly suggesting hypermucoviscous *Klebsiella pneumoniae* (red arrows). (B) Antibiotic susceptibility profile

treatment for soft tissue debridement was necessary. After 6 weeks, cefotaxime was switched to oral trimethoprim-sulfamethoxazole with ofloxacin continuation. Medical evolution was safe.

2 | DISCUSSION

In our case report, *KP* was diagnosed promptly: cerebrospinal fluid (CSF) and blood culture were positive to *KP* in a few hours; hypermucoviscous *KP* was diagnosed promptly by a positive string test (> 5 mm; Figure 2A).

In current practice, hypermucoviscosity *KP* serotype are diagnosed by string test.[1,2] The diagnosis may be confirmed by identifying capsular serotype via polymerase chain reaction assay.[1,2] Hypervirulent *KP* (hv*KP*) is defined by multiple organ localizations, in a few hours, very often in a healthy individual.[1,2] Determination of hypervirulence is genetic and becomes frequent.[2] Multiple virulence genes on plasmids are described.[1] But virulence and antibiotic resistance are not

related.[2] Most cases of hv*KP* are susceptible to antibiotics, except inherent resistance to ampicillin.[2] Association of hypermucoviscosity phenotype and hypervirulent-associated gene is frequent (40.7%) in a descriptive study.[2] Our patient presents all the typical localizations of hv*KP*: meningitis, endophthalmitis, pneumonia, bacteremia, liver abscess, soft tissue infection, and prostatic infection.[3] No risk factor was identified: patient had community- acquired infection, no medical history, no travel history, and no pre-existing digestive disease.[3]

3 | CONCLUSIONS

This case highlights the severity of hypervirulent hypermucoviscous *KP* with multiple and serious localizations in a few hours. It also highlights the major contribution of the bacteriology laboratory, which allowed a rapid diagnosis with blood and CSF culture in association with a string test. This permitted early treatments, including antibiotherapy and specific eye procedure.

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CONFLICTS OF INTEREST

The authors state that there is no conflict of interest.

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