

## CASE REPORT

# *Stenotrophomonas maltophilia*: More than Just a Colonizer!

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### ABSTRACT

*Stenotrophomonas maltophilia* is an emerging gram-negative pathogen that was previously labeled as a colonizer. Nowadays, with multiple antibiotic usage along with certain host factors, infections caused by this organism are getting attention. We hereby report two cases of ventilator-associated pneumonia in postoperative infants by *Stenotrophomonas maltophilia* in a cardiac intensive care unit (ICU).

**Keywords:** Nosocomial, *Stenotrophomonas maltophilia*, Ventilator-associated pneumonia

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### INTRODUCTION

*Stenotrophomonas maltophilia*, is a nil fermenter gram-negative bacterium which has evolved from being 'just a coloniser' to a significant pathogen especially in immunosuppressed settings. It is imperative to isolate and identify it correctly and correlate its clinical importance in relevant clinical settings. Most of the empirical antibiotics choices may not be appropriate for it, thus leading to increased chances of treatment failure and adverse patient outcomes.

Hereby, we report two cases of *Stenotrophomonas maltophilia* as a cause of ventilator-associated pneumonia (VAP) from neonatal postoperative cardiac intensive care unit (ICU).

### CASE DESCRIPTION

#### Case 1

A 3-month-old male baby diagnosed with transposition of great arteries underwent arterial switch operation. The baby was electively intubated during surgery. On day 3, of postoperative period, he started having fever spikes. He was still on mechanical ventilation. The ventilator settings were increased as he was unable to maintain oxygen saturation. There was also presence of thick purulent endotracheal (ET) secretions. Chest X-ray showed diffuse infiltrates in the left lung with collapse of right upper lobe (Fig. 1). He was diagnosed to have ventilator-associated pneumonia (VAP). All the routine investigations were sent along with blood cultures, endotracheal (ET) aspirate culture, urine culture and serum procalcitonin. Serum procalcitonin was 4.5 ng/mL. Hemogram showed raised total leukocyte count (TLC) of 13500 cells/dL with 91% of neutrophils. He was started on intravenous cefoperazone-sulbactam (40 mg/kg/day). On day 3 of starting antibiotics, endotracheal aspirate culture report showed *Stenotrophomonas maltophilia* sensitive to piperacillin-tazobactam, levofloxacin, cotrimoxazole and minocycline. The reported isolate was interpreted as colonizer and no modification of antibiotics was done. Another report of repeat endotracheal aspirate culture also showed *Stenotrophomonas maltophilia* with the same pattern of drug sensitivity. As there were no signs of improvement, levofloxacin (8 mg/kg/q12h) was also added. Subsequently after adding levofloxacin the baby got weaned off from ventilator on day 5 of modification and was maintained on oxygen at 6 L/min through

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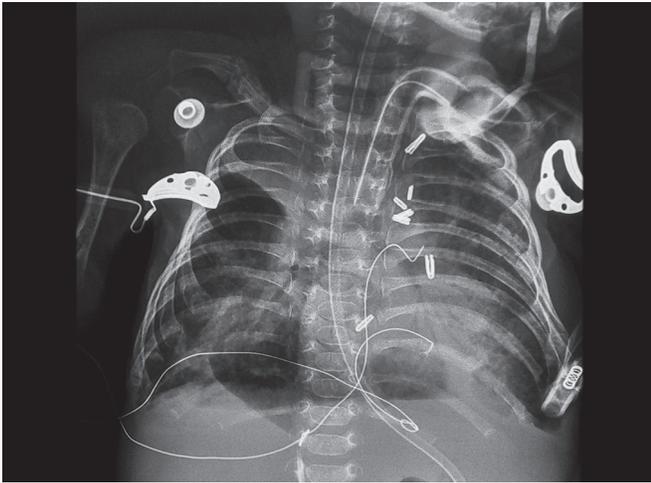
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**Fig. 1:** Chest X-ray showing right upper lobe collapse with diffuse infiltrates in left lung parenchyma

face mask. But the patient continued to require supplemental oxygen therapy through face mask. The repeat chest X-ray also showed nonresolving infiltrates in the left middle zone. The case was reviewed and he was started on cotrimoxazole (6 mg/kg/day). Other antibiotics were stopped. The patient started maintaining saturation on room air after 2 days of starting cotrimoxazole. Later on, radiological resolution was also seen. He received a total of 14 days of cotrimoxazole therapy and was discharged in a stable condition.



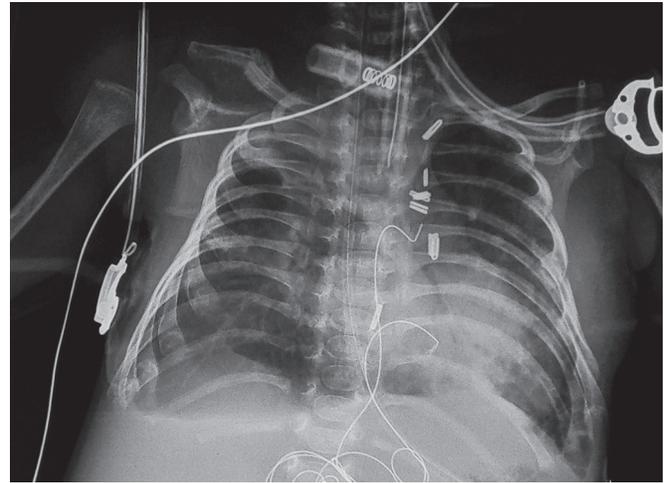
**Fig. 2:** Chest X-ray showing right upper lobe collapse with right middle zone infiltrates

### Case 2

A preterm baby (23-day-old) got admitted with multiple ventricular septal defects (VSDs) and coarctation of aorta. The baby underwent surgical correction for coarctation of aorta. The baby was electively intubated before surgery. While on mechanical ventilation, he started developing purulent ET secretions, increased FiO<sub>2</sub> requirement and intolerance to nasogastric (NG) tube feeding. The chest X-ray was done that showed infiltrates on right middle zone and collapse of right upper zone (Fig. 2). On auscultation there was bronchial breath sounds on right mammary and inframammary region. The patient was started on broad spectrum antibiotics, meropenem (20 mg/kg/q8h), levoflox (8 mg/kg/q12h) and teicoplanin (6 mg/kg/day). TLC was within normal limit with 89% of neutrophils. Serum procalcitonin was 0.26 ng/mL. The endotracheal aspirate culture showed *Stenotrophomonas maltophilia* sensitive to cotrimoxazole, piperacillin-tazobactam and colistin. The isolate was resistant to meropenem. As the baby was not showing any signs of improvement, the antibiotics were modified to cotrimoxazole (6 mg/kg/day TMP) and colistin (50000 IU/kg/day). Repeat culture was sent on day 2 of modifying antibiotics. Hemogram, liver function and Kidney function tests were monitored. Endotracheal aspirate culture again showed *Stenotrophomonas maltophilia* with same sensitivity profile. The patient tolerated the medicines with no signs of toxicity and showed signs of improvement with decreasing infiltrates in chest X-ray (Fig. 3) and FiO<sub>2</sub> requirement. Patient was continued on cotrimoxazole and colistin for 14 days. The baby continued to require minimal ventilator support. The failure to wean is attributed to preterm lung injury with ventilator related lung injury.

### DISCUSSION

*S. maltophilia*, which was once considered a trivial ubiquitous organism, is today increasingly being recognized as a cause of nosocomial infections especially in immunosuppressed patients. There are reports of *S. maltophilia* identified as a pathogen of pneumonia, bloodstream infection, wound and urinary tract infection, skin and soft tissue infections, ocular infections and meningitis.<sup>1-3</sup> It has been associated with a high mortality rate.<sup>2</sup> It is thus crucial to be aware of this pathogen and its management in relevant settings.



**Fig. 3:** Chest X-ray showing improvement on antibiotic

*S. maltophilia* poses question for the clinician in distinguishing colonization from true infection. Isolation in immunosuppressed and debilitated individual and isolation from a sterile site with signs and symptoms suggestive of infection should not be disregarded. Risk factor for this infection includes immunosuppression, malignancy, prolonged hospital stay, indwelling devices, exposure to broad-spectrum antimicrobials, neutropenia, mucositis, and total parenteral nutrition.<sup>4-7</sup>

Our cases were infants out of which one was a preterm neonate, post cardiac surgery, with indwelling drains, and mechanical ventilation along with ICU stay all of which are risk factor for this serious infection.

*S. maltophilia* have frequently been isolated and traced to colonize various devices and fluids in hospital settings, such as nebulizers, dialysis machines, water baths, disinfecting solution and intravenous fluids.<sup>5</sup> It can be transferred by hands of health care providers. This is an alarming trend and further reinforces the fact that healthcare providers need to improve infection control practices and keep a close surveillance system.

*S. maltophilia* is a crucial nosocomial pathogen associated with high mortality rate but can be managed successfully if timely diagnosed and promptly treated. Both our cases improved with treatment. However, diagnosis and management of this organism may pose dilemmas. A significant challenge in managing such a patient is the extensive resistance to many commonly used antibiotics like carbapenems, cephalosporins, etc.<sup>8</sup>

A study by Lai et al., 2004 showed that most effective antibiotics in vitro were trimethoprim-sulfamethoxazole, ciprofloxacin, chloramphenicol, and ceftazidime.<sup>6</sup> In present report, both patients showed excellent response and complete resolution of symptoms with trimethoprim-sulfamethoxazole. As more and more cases of *Stenotrophomonas maltophilia* causing nosocomial infections are being isolated, clinicians should be made aware of the implications of isolating this organism and should interpret such isolations in light of clinical settings.

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