

CASE REPORT

***Pseudomonas Aeruginosa* in an Immunocompetent Individual with Acute Tonsillitis; An Uncommon Finding: A Case Report**Sukhdeep Kaur Basur¹, Snigdha Goyal², Abha Singla³, Abhinav Garg⁴

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ABSTRACT

The tonsils, lymphoid tissue located in the throat, serve as the first line of immune defense against pathogens entering the oral cavity. Tonsillitis is a common presentation in ENT clinics, affecting both children and adults. *Staphylococcus aureus* and *Streptococcus* are the most frequently isolated bacteria from throat swab cultures in these cases. While *Pseudomonas aeruginosa* is not a rare pathogen in acute or chronic tonsillitis, its isolation from an immunocompetent individual with this condition is uncommon. This case report presents an unusual instance of *Pseudomonas* bacteremia in a 20-year-old healthy male with acute tonsillitis.

KEYWORDS

• Acute Tonsillitis • *Pseudomonas Aeruginosa* • Pathogenic Bacteria

INTRODUCTION

Tonsils are collection of lymphoid oropharyngeal tissue located in subepithelial layer of pharyngeal mucosa. They are bounded anteriorly by palatoglossal and posteriorly by palatopharyngeal folds respectively. Tonsils, when attacked by virus, bacteria or fungus,

become inflamed and the condition is then called Acute tonsillitis. Tonsils in tonsillitis become swollen, red, and may get coated with white or yellow membrane.^{1,2} Other symptoms are sore throat, fever, malaise, enlarged lymph nodes.^{1,5} This is amongst commonest diseases seen in otolaryngology. Tonsils being

AUTHOR'S AFFILIATION:

¹ Senior Medical Officer, Department of Otolaryngologist (ENT Specialist), District Civil Hospital, Sector 6, Panchkula, Haryana, India.

² Medical Officer, Department of Laboratory Medicine, Civil Hospital, Sector 6, Panchkula, Haryana, India.

³ Medical Officer, Department of Otolaryngologist, District Civil Hospital, Sector 6, Panchkula, Haryana, India.

⁴ DNB Resident, Department of Otolaryngologist, District Civil Hospital, Panchkula, Sector 6, Haryana, India.

CORRESPONDING AUTHOR:

Sukhdeep Kaur Basur, Senior Medical Officer, Department of Otolaryngologist (ENT Specialist), District Civil Hospital, Sector 6, Panchkula, Haryana, India.

E-mail: basursukhdeep@gmail.com

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first line of our defense system, are activated once they are exposed to viruses or bacterial pathogen. Immune reaction is initiated and antibodies formed. Pathogens attack tonsils and initiate cytokine reaction causing release of inflammatory mediators. This inflammatory reaction causes tonsils to become red and swollen.¹⁻⁴

The most common causative bacterial organism are *Staphylococcus aureus* and β hemolytic streptococcus.^{2-6,13} Other bacterial isolates seen in acute tonsillitis are *Klebsiella Pneumoniae*,^{3,5,6,13} *E. coli*,^{3,5} *Pseudomonas aeruginosa*.^{5,6,13} *Pseudomonas aeruginosa*, an uncommon isolate in cases of acute tonsillitis is aerobic, Gram-negative bacteria which are motile with single polar flagellum. It produces two pigments, Pyoverdine and Pyocyanin.¹ Due to considerable genetic capacity, it has ability to develop antibiotic resistance.^{1,5} Its incidence is mostly found in immunocompromised individuals, those hospitalized and treated with broad spectrum antibiotics or have some underlying dysfunction of immune system or patients on chemotherapy.^{1,7,8} We present a case of *Pseudomonas* bacteremia in a 20-year-old immunocompetent male who visited our

otolaryngology department.

CASE REPORT

A 20-year-old male with no significant past medical history presented to our otolaryngology clinic with a 3-4 day history of sore throat, fever, painful swallowing, and body aches. He denied prior tonsil infections and was initially treated with oral amoxicillin. Two days later, his symptoms worsened, including severe throat pain on swallowing, persistent fever, and decreased oral intake. He was admitted for intravenous medication. Blood tests and a throat swab for Gram stain and culture were sent for analysis.

Intravenous fluids and antibiotics (amoxicillin-clavulanate 1.2g IV twice daily), along with analgesics and antipyretics, were administered. Continuous monitoring revealed normal blood pressure, an elevated pulse and persistent fever. Laboratory investigations showed hemoglobin level of 14.5 g/dL, total leukocyte count of 15,120/ μ L, and normal liver and renal function. Viral markers were normal, and HIV testing non reactive.



Figure 1: Shows bilateral enlarged and inflamed tonsils

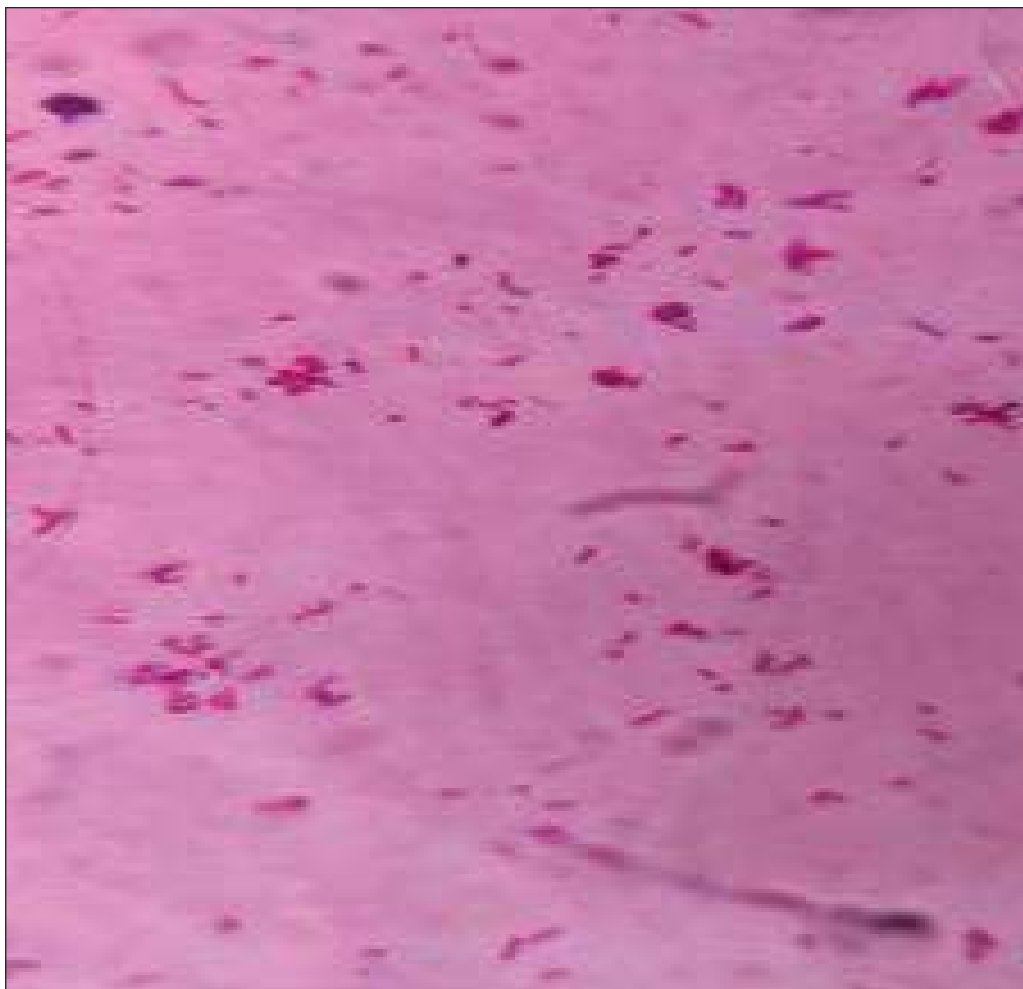


Figure 2: Shows clusters of Gram-negative bacilli (*Pseudomonas aeruginosa*)

After three days of inpatient treatment, his fever responded to antipyretics, but throat pain persisted, and tonsils remained enlarged and congested (Figure 1). Next day, the throat swab culture and sensitivity report identified *Pseudomonas aeruginosa* as the causative organism (Figure 2). The organism was sensitive to several antibiotics, including amikacin, cefepime, cefoperazone, ceftazidime, gentamicin, meropenem, and piperacillin-tazobactam.

Intravenous piperacillin-tazobactam 4.0g three times daily was initiated. The patient responded rapidly, with reduction in fever and significantly reduced throat pain. A repeat complete blood count showed decrease in total leukocyte count to 6,190/ μ L. Following complete resolution of symptoms, patient was discharged with 7-day prescription for oral antibiotics and instructed for a follow-up thereafter.

DISCUSSION

Pseudomonas aeruginosa is usually seen in patients with ear or sinus disease, it is rarely seen in acute tonsillar infection as seen in our case. Danielides *et al.*⁹ reported a case of recurrent tonsillitis caused by *Pseudomonas aeruginosa*. They found it to be a rare finding but Longanthan *et al.*⁶ did a comparative study of bacteriology in recurrent tonsillitis amongst adults and children and found that it is not so rare finding in recurrent tonsillitis. A similar study was conducted in Kerala, they too, were able to isolate *Pseudomonas aeruginosa* as bacterial isolate in two patients with acute tonsillitis but both these patients underwent chemotherapy.¹³ *Pseudomonas aeruginosa* is not commonly isolated from cases of acute tonsillitis in immunocompetent individuals.

According to study done by Mahajan and Ingale most common pathogen in acute

tonsillitis was staphylococcus aureus and no case of *Pseudomonas aeruginosa* was found. They were of the opinion that prevalence of bacterial pathogen may vary in different areas.³ *Pseudomonas aeruginosa* is most commonly isolated as bacterial pathogen in nosocomial infection or in patients with low immunity status or with respiratory disorders.^{1,8,10} It is not a common isolate in immunocompetent person^{1,9} as seen in our case.

***Pseudomonas* resistance** - Due to irrational usage and wrong dosage schedule antibiotic resistance is on the rise. It is seen that most antibiotics have become resistant in treating patients of acute tonsillitis.³ Acute tonsillitis if not treated appropriately can lead to lymphadenitis, parapharyngeal space abscess, quinsy, acute rheumatic fever, rheumatic heart disease and acute glomerulonephritis¹³ Bacterial pathogen isolated from acute tonsillitis have different sensitivity patterns. Many studies have been conducted to study the antibiotic sensitivity pattern in tonsillitis and pharyngotonsillitis patients.^{2,11,12,13} According to study conducted in Kerala all cases showing *Pseudomonas aeruginosa* as bacterial isolate responded to meropenem.¹³ Our case also responded to meropenem and symptoms of tonsillitis subsided remarkably. Usually, patients when treated after studying the bacterial sensitivity pattern, are completely cured. These patients are treated with antibiotics given according to sensitivity pattern, as was eventually done in our case.

CONCLUSION

Numerous studies investigating bacterial isolates in acute and chronic tonsillitis have identified *Staphylococcus aureus* as the most prevalent pathogen, followed by β -hemolytic streptococci. These studies have generally reported penicillin sensitivity for these common isolates. While *Pseudomonas aeruginosa* has been previously documented in recurrent tonsillitis, it is typically associated with immunocompromised individuals. *Pseudomonas aeruginosa* exhibits a different antibiotic sensitivity profile compared to *S. aureus* and *Streptococcus*, which are commonly susceptible to penicillin. Therefore, it is recommended that throat swabs be routinely obtained in both acute and recurrent tonsillitis cases for Gram stain, culture, and sensitivity testing. Targeted antibiotic therapy based

on these sensitivity results can often lead to complete resolution of the infection, potentially avoiding the need for tonsillectomy and its associated stress. As the tonsils play an important role in the immune system, preserving these organs through appropriate medical management is desirable whenever possible.

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Ethical Approval

All authors have agreed to authorship, read and approved the manuscript and given consent for publication of manuscript.

Competing Interests

All authors report no conflict of interests.

Consent

No personal details of the patient is shared, hence consent form not attached.

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