

An Immune Competant Pediatric Case of Retropharyngeal Abscess Caused by Extended Spectrum Beta Lactamase Producing *Klebsiella pneumoniae*

Genişletilmiş Spektrumlu Beta Laktamaz Üreten *Klebsiella pneumoniae*' nin Neden Olduğu Pediatrik Bir Retrofaringeal Apse Olgusu

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ABSTRACT

Retropharyngeal abscess is a life threatening disease in children. Retropharyngeal infections are mainly caused by staphylococci, streptococci and anaerobes. The presence of *Klebsiella pneumoniae* in deep neck infections is considered quite rare in both adults and children especially without any comorbidities. Besides, community acquired extended spectrum beta lactamase is increasing unfortunately even in pediatric previously healthy patients. Herein we report a pediatric immunocompetant case who presented with a fatal deep neck infection caused by *Klebsiella pneumoniae*.

Keywords: Deep neck infection, *Klebsiella pneumoniae*, retropharyngeal abscess

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ÖZET

Retrofaringeal apse çocuklarda hayatı tehdit eden bir hastalıktır. Retrofaringeal enfeksiyonlara esas olarak stafilokok, streptokok ve anaerob bakteriler neden olur. Derin boyun enfeksiyonlarında *Klebsiella pneumoniae* varlığı, özellikle komorbiditesi olmayan yetişkinlerde ve çocuklarda oldukça nadir görülmektedir. Bunun yanında toplum kökenli genişletilmiş spektrumlu beta laktamaz sentezleyen mikroorganizmalara bağlı enfeksiyonlar ne yazık ki daha önceden sağlıklı olan pediatrik hastalarda bile giderek artmaktadır. Burada *Klebsiella pneumoniae*'ya bağlı ölümcül derin boyun enfeksiyonu ile başvuran pediatrik immünkompetan bir olgu sunulmaktadır.

Anahtar Sözcükler: Derin boyun enfeksiyonu, *Klebsiella pneumoniae*, retrofaringeal apse

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INTRODUCTION

Deep neck infections (DNI) are life-threatening diseases generally affecting children. They are capable of significant mortality and morbidity (1). Deep neck infections are classified as retropharyngeal, parapharyngeal and peritonsillar abscess according to the anatomical location of the infection (2,3). Retropharyngeal abscess occurs most commonly in children between the ages of two and four years, but can occur in other age groups including neonates (4). Clinical presentation might be insidious (5). Common clinical manifestations include fever, sore throat, dysphagia, neck mass or swelling, dyspnea, and limited neck motion (6). There are rare but fatal complications of retropharyngeal abscess. Infection can spread from the retropharyngeal space to other deep neck spaces, to adjacent structures, and to the bloodstream. Common complications are; airway obstruction, aspiration pneumonia if the abscess ruptures into the airway, internal jugular vein thrombosis, jugular vein suppurative thrombophlebitis (Lemierre's syndrome), carotid artery rupture, mediastinitis (suggested by widening of the mediastinum on chest radiograph) and atlantoaxial dislocation (7). These infections are generally polymicrobial (1,2).

Retropharyngeal infections are mainly caused by staphylococci, streptococci and anaerobes (8). The presence of *Klebsiella pneumoniae* in deep neck infections is considered quite rare in both adults and children especially without any comorbidities (9). Herein we report a previously healthy pediatric case who presented with deep neck infection caused by extended spectrum beta lactamase producing *Klebsiella pneumoniae*.

CASE REPORT

One year old boy was admitted to our hospital with the complaints of fever, progressive painful left neck mass and neck stiffness for 4 days. He had no underlying diseases. There was no other pathologic findings in his physical examination. His cervical computerized tomography (CT) revealed a 20x30x43 mm retropharyngeal cellulitis (low attenuation in the retropharyngeal space) and there was anterior displacement of posterior wall of pharynx and lateral displacement of carotid space. These findings were compatible to retropharyngeal abscess (figure 1&2). His C-reactive protein was 118 mg/L and leukocyte count was 27440/uL. Ampicilline sulbactam (150mg/kg/d) and clindamycin (40mg/kg/d) were initiated. In a few hours dyspnea and respiratory distress occurred. He was consulted to oto rhino laryngology and surgical drainage was planned. Purulent discharge was revealed and samples were obtained for gram stain and culture. There was serious dyspnea and airway obstruction so the patient was followed in pediatric intensive care unit under mechanical ventilation. He was mechanically ventilated for three days. Gram negative bacilli were observed in gram stain and *Klebsiella pneumoniae* grew in both pus and blood cultures. Antibiotic susceptibility test results are shown in table. Antibiotic therapy was changed with ertapenem (15mg/kg/dose x 2). Fever resolved in 1,5 days. Airway obstruction began to resolve in control CT on the next day and he was extubated in three days. His immunologic tests revealed normal. Antibiotic therapy was completed to 3 weeks and he was healed without any complication.

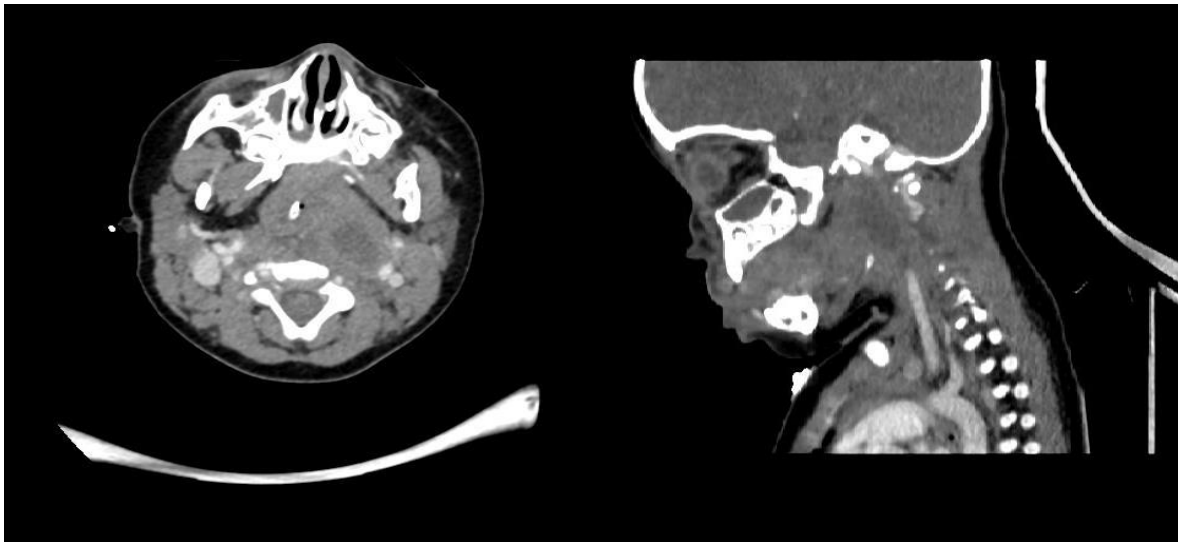


Figure 1,2- Magnetic resonance images of the retropharyngeal abscess.

Table-1 Antimicrobial Susceptibility of *Klebsiella pneumoniae*

Antibiotics	Susceptibility	MIC (mg/L)
Amikacin	Susceptible	≤1
Gentamicin	Susceptible	≤1
Cefepime	Resistant	>64
Imipenem	Susceptible	≤2
Meropenem	Susceptible	≤2
Piperacillin-tazobactam	Resistant	>128
Ceftazidime	Resistant	>64
Ciprofloxacin	Resistant	>4
Colistin	Susceptible	≤0.5

DISCUSSION

According to the current literature, retropharyngeal abscess caused by extended spectrum beta lactamase synthesizing *Klebsiella pneumoniae* is very uncommon in immunocompetent children. This pediatric case is remarkable because presents an immune competent pediatric case of retropharyngeal abscess caused by ESBL (+) *K. pneumoniae*.

Deep neck space infections are typically polymicrobial and represent the normal resident flora of the contiguous mucosal surfaces from which the infection originated (7). The most common pathogens are *S.pyogenes* (group A streptococcus [GAS]), *S. aureus* (including methicillin-resistant *S.aureus* [MRSA]), and respiratory anaerobes (including Fusobacteria, Prevotella, and Veillonella species) (9,10). In a study by Parhiscar et al, among the isolates of aerobic organisms, the ratio of gram-positive to gram-negative bacteria was around 3:2 (61.7%:38.3%). However, the ratio of gram-negative bacteria was less than 4% totally (11). According to Yang et al. gram negative bacteria was shown as 23.5% of etiologic agents for deep neck infection (12).

As one of these agents, *Klebsiella pneumoniae* is known to be a rare pathogen as the cause of retropharyngeal abscess in children (13). In a study of Chang et al. leading causes of deep neck infections were reported as streptococci (15.6% *Streptococcus pyogenes*, %12.5 other streptococci), anaerobes and mixed flora in 28.1% of patients. 15.6% of patients had normal flora (1). *Klebsiella pneumoniae* was isolated only in 1 patient who had type 1 Diabetes mellitus (1). Since than many reports were published about deep neck infections in children and *Klebsiella pneumoniae* was not reported as a common pathogen (10,14,15). In a case series of deep neck infection reported by Chung et al. There was only one patient whose pus culture grew *Klebsiella pneumoniae* (3.2%) (16). In adult study from Taiwan, *Klebsiella pneumoniae* has been frequently isolated from deep neck space infections, particularly from adult patients who have diabetes mellitus (7). It was noted that, patients with *K. pneumoniae* fascial space infections were characterized by a higher prevalence of diabetes mellitus, longer durations of antimicrobial therapy and hospital stay, and are more likely to have repetitive *K. pneumoniae* infections after the first episode (7). In our country, no reports have been published that shows *Klebsiella pneumoniae* as cause of retropharyngeal abscess.

Another important point of our report is remarking the emergence of multidrug resistant (MDR) Gram-negative bacteria (GNB) which poses a significant threat for global public health because of the limited therapeutic options for treatment (17). One of the main mechanisms for resistance is extended-spectrum β -lactamase synthesis (ESBLs) (18). In recent surveys, a significant increase in the ESBL rate was reported from all parts of the world (19). *Klebsiella pneumoniae* and *Escherichia coli* remain the major ESBL-producing organisms isolated worldwide (20). The prevalence of ESBL producing *E. coli* is reported as high as 36% (21) and *Klebsiella* 15% (22) in different studies. Community acquired ESBL is also another important situation and known to be increasing worldwide. Our patient was a previously healthy outpatient but presented with a life-threatening disease caused by ESBL producing *Klebsiella*.

CONCLUSION

Retropharyngeal infections are rapidly progressive and life threatening infections in children, empirical antibiotic therapy should be started immediately and otolaryngology consultation should be performed for surgical drainage if possible (23). Empirical antibiotic regimen should cover possible etiologic agents such as staphylococci, streptococci and anaerobes. But in pediatric patients who are not responding well or getting worse under empirical therapy, *K. pneumoniae* should be kept in mind as a rare but important causative agent and as community acquired ESBL positivity is rising, rearrangement in antibiotic therapy to cover *K. pneumoniae* (like piperacilline tazobactam, ertapenem, meropenem) may be required in some cases.

Conflict of interest

No conflict of interest was declared by the authors.

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