

CASE REPORT

Pediatric Case of Acute Epiglottitis due to *Staphylococcus aureus*

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Abstract

Epiglottitis is an inflammatory condition of the epiglottis and its nearby structures, and leads to fever, drooling, and sore throat. This potentially fatal disease can progress to airway obstruction and requires emergency intervention. *Haemophilus influenza* used to be the main causative agent for Epiglottitis. Here, we report a case of a 4-year-old patient with epiglottitis caused by *Staphylococcus aureus* demonstrated by a positive swab culture of the epiglottis.

Keywords: Epiglottitis, *Staphylococcus Aureus*, Pediatric.

A previously healthy four-year-old boy presented to the emergency department with dyspnea. He had received his vaccinations, including the Hib series, as per the Jordanian Vaccination National Program schedule, in which the doses were administered in a combination of DTaP, IPV, and Hib. The evening prior to admission, the boy complained of neck pain, throat discomfort, and a mild fever, for which his mother administered antipyretics the next morning.

Upon waking, he was unable to speak and exhibited signs of respiratory distress, including shortness of breath, tracheal tug, intercostal recession, and inspiratory stridor prompting immediate transportation to the emergency department.

His vital signs were: Temperature 39.0 °C (102.2 F), pulse 150 bpm and regular, respiratory rate 40/min, oxygen saturation 94% on 15 liters of supplemental oxygen by mask.

Despite initially maintaining intact consciousness, the patient exhibited marked irritability and attempted to sit up whenever placed in a supine position. Examination of the back of the throat was not performed. Initially, the patient was diagnosed with croup and administered an intramuscular dose of dexamethasone, along with multiple nebulized epinephrine treatments in the emergency room, which yielded no improvement.

His chest radiograph was unremarkable. His CBC showed a WBC of 21.0 k/cmm, PMNs 90.9%, monocytes 6.3 %, lymphocytes 2.8%, Hb 12.9, and platelets of 284 k/cmm. CRP peaked at 35.8 mg/L. He did not respond to the aforementioned

treatments and was transferred to the PICU. There, his level of consciousness began to deteriorate and he exhibited agitation, combativeness, and aphonia. Anesthesia and ENT staff were alerted immediately, and arrangements were made for the patient to undergo intubation in the operating room, with the ENT surgeon on standby in case a tracheostomy would be needed. Significant supraglottic swelling with creamy secretions was visualized during laryngoscopy (Figure 1). These secretions were cultured. The anesthesia team confirmed the presence of a congested epiglottis, but had difficulty seeing the vocal cords. The patient was intubated using a size 3 endotracheal tube, which is typically used for a newborn baby.



Figure 1: Laryngoscopic findings during intubation

Blood culture was negative. Epiglottis pus culture grew Methicillin *S. aureus* (MSSA) which was sensitive to clindamycin, erythromycin, TMP/SMX, vancomycin, cefuroxime and amoxicillin/ clavulanic acid. Standard methods of identification and susceptibility testing were done by the Kirby-Bauer Disk Diffusion Test.

The patient was initially treated with vancomycin and cefotaxime. Upon

identification of Methicillin-Sensitive *Staphylococcus aureus* (MSSA) as the causative agent, IV vancomycin was discontinued on the fourth day of admission and replaced with IV cloxacillin, while cefotaxime therapy was continued. His fever and leukocytosis resolved the day after admission. The patient remained intubated for two days without requiring high settings for mechanical ventilation, after which he

was successfully extubated. Subsequently, he demonstrated rapid improvement and was transferred from the PICU to the standard floor. He completed a total of 13 days of antibiotic therapy. A follow-up visit as an outpatient confirmed his complete recovery.

DISCUSSION

Epiglottitis has become a rare condition nowadays, largely attributed to the widespread administration of the Hib vaccine in the early 1990s. Similarly, other diseases caused by Hib, such as meningitis and bacteremia, also significantly declined or nearly disappeared [1]. In the era following the widespread administration of the Hib vaccine, *Streptococcus pneumoniae* and *Staphylococcus aureus* are increasingly being identified as causative agents for epiglottitis [2] [3]. It is a serious disease and potentially fatal if not managed urgently. Therefore, medical students and residents should be taught how to recognize and manage epiglottitis.

Staphylococcus aureus epiglottitis was reported here in a previously healthy 4-year-old child. The patient exhibited clinical features indicative of epiglottitis. A swab culture taken directly from the purulent epiglottis at the time of intubation revealed *Staphylococcus aureus*. It is noteworthy that in most cases, throat swabs from both pediatric and adult patients with epiglottitis fail to grow *Staphylococcus aureus* [4] [5].

Often preceding disease is the upper respiratory tract colonization of

Streptococcus pneumoniae, *Haemophilus influenzae*, and *Staphylococcus aureus*; this serves as a source of transmission. It is suggested that *Staphylococcus pneumoniae* and *Haemophilus influenzae* have a cooperative relationship and are more likely to colonize together than independently. Colonization with these species is associated with a lower prevalence of *S. aureus*. The negative associations between the carriage of *Staphylococcus pneumoniae*/*Haemophilus influenzae* and *Staphylococcus aureus* raise concerns that vaccination against the former could unintentionally lead to increased carriage or disease caused by *Staphylococcus aureus* [6] [7] [8] [9].

About 20% of healthy individuals exhibit persistent nasal carriage of *Staphylococcus aureus*, and 60% are intermittent carriers [10]. Many people change their pattern of carriage between 10 and 20 years old, and children are more likely to be persistent carriers than adults [11].

Pediatric cases of *Staphylococcus aureus* epiglottitis are reported less frequently compared to adults. Despite this, some adult studies still question the strength of evidence supporting *Staphylococcus aureus* as a causative agent for epiglottitis [12] [13] [14], particularly when isolated from a direct swab of the epiglottis rather than from blood culture. Nevertheless, we advocate for keeping *Staphylococcus aureus* in consideration as a potential causative organism for epiglottitis.

REFERENCES

1. Slack MP, Cripps AW, Grimwood K, Mackenzie GA, Ulanova M. Invasive *Haemophilus influenzae* infections after 3 decades of Hib protein conjugate vaccine use. *Clinical Microbiology Reviews*. 2021 Jun 16;34(3):10-128.
2. Hanna J, Brauer PR, Berson E, Mehra S. Adult

- epiglottitis: trends and predictors of mortality in over 30 thousand cases from 2007 to 2014. *The Laryngoscope*. 2019 May;129(5):1107-12.
3. Ligon BL. Immunization for *Haemophilus influenzae* type b: Effects on mortality and morbidity in children under five years of age. In *Seminars in Pediatric Infectious Diseases* 1998 Jan 1 (Vol. 9, No. 1, pp. 70-76).
 4. Faden H. The dramatic change in the epidemiology of pediatric epiglottitis. *Pediatric Emergency Care*; 2006. Available from: 10.1097/01.pec.0000221347.42120.f8.
 5. Harris C, Sharkey L, Koshy G, Simler N, Karas JA. A rare case of acute epiglottitis due to *Staphylococcus aureus* in an adult. *Infectious Disease Reports*. 2012 Jan;4(1):e3.
 6. Shak JR, Vidal JE, Klugman KP. Influence of bacterial interactions on pneumococcal colonization of the nasopharynx. *Trends in Microbiology*. 2013 Mar 1;21(3):129-35.
 7. Lewnard JA, Givon-Lavi N, Huppert A, Pettigrew MM, Regev-Yochay G, Dagan R, Weinberger DM. Epidemiological markers for interactions among *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Staphylococcus aureus* in upper respiratory tract carriage. *The Journal of Infectious Diseases*. 2016 May 15;213(10):1596-605.
 8. Blaser MJ, Falkow S. What are the consequences of the disappearing human microbiota? *Nature Reviews Microbiology*. 2009 Dec;7(12):887-94.
 9. Kopterides P, Falagas ME. Potential consequences of the pneumococcal conjugate vaccine. *The New England Journal of Medicine*. 2006 Jul 1;355(1):95-6.
 10. Kluytmans JA, Van Belkum A, Verbrugh H. Nasal carriage of *Staphylococcus aureus*: epidemiology, underlying mechanisms, and associated risks. *Clinical Microbiology Reviews*. 1997 Jul;10(3):505-20.
 11. Armstrong-Esther CA, Smith JE. Carriage patterns of *Staphylococcus aureus* in a healthy non-hospital population of adults and children. *Annals of Human Biology*. 1976 Jan 1;3(3):221-7.
 12. Young LS, Price CS. Complicated adult epiglottitis due to methicillin-resistant *Staphylococcus aureus*. *American Journal of Otolaryngology*. 2007 Nov 1;28(6):441-3.
 13. Fujisawa J, Mutoh T, Kawamura K, Sawada N, Ono D, Yamaguchi T, Morioka I. Acute epiglottitis caused by community-acquired methicillin-resistant *Staphylococcus aureus* in a healthy infant. *Infection and Drug Resistance*. 2018 Oct 10:2063-7.
 14. Harris C, Sharkey L, Koshy G, Simler N, Karas JA. A rare case of acute epiglottitis due to *Staphylococcus aureus* in an adult. *Infectious Disease Reports*. 2012 Jan;4(1):e3.

حالة طفل مصاب بالتهاب لسان المزمار الحاد بسبب المكورات العنقودية الذهبية

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الملخص

إلتهاب لسان المزمار هو عبارة عن إتهاب نادر وخطير في لسان المزمار والأنسجة القريبة ويؤدي إلى الحمى وسيلان اللعاب وإلتهاب الحلق. يمكن أن يتطور هذا المرض إلى انسداد في مجرى الهواء ويتطلب تدخلا طارئا وإلا حدثت الوفاة، كان المسبب الأكثر احتمالية لإلتهاب لسان المزمار سابقا هي بكتيريا المستدمية النزلية وذلك قبل إنتشار مطعومها، هنا نسجل حالة لمريض يبلغ من العمر 4 سنوات مصاب بالتهاب لسان المزمار الناجم عن المكورات العنقودية الذهبية التي ظهرت في زراعة إيجابية لمنطقة لسان المزمار

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