

Reviewing the diagnosis and treatment approaches of epiglottitis

Wjood Abdullah Altalhi , Abdulrahman Hassan O Makin , Reem Mohammed Noor Kalakattawi ,
Yahya Ali A Khubrani , Nassar Mohammed Alqurashi , Sulaiman Ahmed Hussain Darbashi , Muna
Mahmod Saleh Sambawah , Mohammed Ahmed H Ageeli

Abstract:

Current review was aimed to discuss and overview the epiglottitis from different clinical approaches, as we intended to review the diagnostic methods used for a proper diagnosis of epiglottitis, as well as the treatment of it. Review was performed, following the review studies guidelines using electronic medical databases; (PubMed, Scopus, Embase, Google Scholar). All databases searches were performed for articles published up to June, 2017. Epiglottitis is a life-threatening disorder with major effects to the anesthesiologist as a result of the potential for laryngospasm and unalterable loss of the respiratory tract. Severe epiglottitis

could happen at any age. Early diagnosis with careful as well as quick intervention of this severe problem is essential to avoid deadly difficulties. The suitable analysis test for the diagnosis of epiglottitis would be basic, rapid, noninvasive, as well as very accurate, carried out at the bedside, as well as would certainly not use ionizing radiation.

IJSER

Introduction:

Epiglottitis is an acute inflammatory condition entailing the epiglottis as well as other supraglottic structures that, in serious instances, can cause respiratory tract blockage. Person populaces at certain risk for epiglottitis consist of middle-aged white men, those with smoking background, as well as those with comorbid clinical conditions such as diabetic issues ^(1,2,3). Epiglottitis has actually been significant inflammatory sources of respiratory tract obstruction in youngsters. Haemophilus influenzae type b (Hib) is the most common cause in kids. Many

instances of severe epiglottitis in grownups are believed to be triggered by various other bacterial organisms, consolidated or viral viral-bacterial infections, and also noninfectious etiologies. Most of current studies (i.e. of the Hib vaccination age) have actually been carried out in North America, Northern European countries, Australia as well as East Asia, and have shown that acute epiglottitis is nowadays an adult problem ^(4,5,6,7,8,9,10). The frequency of youth epiglottitis was located to be lowering in the USA, in Canada, Australia, as well as in Finland ^(2,11,12). At the same time, the incidence in adults was shown to be expanding in the USA, and also in Iceland ^(2,4,12). Similar epidemiological fads have been located in current literature with the sex proportion increasing from 1.1 to 1.6, with the mean age enhancing from 40 to 50 years old ^(2,4,11,12).

Retrospective testimonials have additionally disclosed that infants younger than age 1 year and the senior older compared to age 85 years are especially at risk to this disease ⁽⁴⁾. However, a lot of clients have no contributing danger variables ^(2,11,4). Stridor as well as respiratory system distress are taken into consideration strong forecasters for air passage intervention ⁽²⁾. Much more refined signs and symptoms, such as subjective shortness of breath, tachycardia, tachypnea, as well as rapid signs and symptom beginning, have likewise been revealed to be forecasters for respiratory tract intervention ⁽²⁾.

With the arrival of immunizations against Haemophilus flu serotype b, epiglottitis in the pediatric populace has declined rapidly in the past numerous decades ^(1,2). As a result, most instances of epiglottitis now occur in grownups ^(2,5). The differential medical diagnosis for epiglottitis consists of benign problems such as pharyngitis, laryngitis, viral syndrome, and flu in addition to serious conditions creating airway blockage, consisting of angioedema, anaphylaxis,

foreign body goal, and also caustic consumption. Properly determining epiglottitis is vital due to the fact that it might need prompt treatment. Therapy for epiglottitis is tailored to the degree of air passage obstruction, with some clients enhancing with conservative steps and others calling for a rising fabricated airway^(2,4).

Current review was aimed to discuss and overview the epiglottitis from different clinical approaches, as we intended to review the diagnostic methods used for a proper diagnosis of epiglottitis, as well as the treatment of it.

Methodology:

Review was performed, following the review studies guidelines using electronic medical databases; (PubMed, Scopus, Embase, Google Scholar). All databases searches were performed for articles published up to June, 2017, and the following search terms were used “acute epiglottitis,” “adult epiglottitis,” “epiglottitis,” combined with “diagnosis” and “treatment”

OR "Management. "Additionally, references within review articles of epiglottitis were searched for potential studies.

Discussion:

○ **Diagnosis of epiglottitis:**

Individuals with epiglottitis generally existing to the ED however also still variable. Patients frequently present with aching throat, odynophagia, as well as voice change ^(2,6). Diagnosis is scientific yet is confirmed by nasopharyngoscopy with straight visualization of an inflamed epiglottis and/or supraglottic tissues ⁽⁷⁾. In a secure person, the emergency doctor may make a decision to carry out nasopharyngoscopy as in case 4 above. A group strategy in the operating room with the Anesthesiology and Otolaryngology Departments is favored for epiglottis visualization in clients with professional problem for putting in jeopardy respiratory tract obstruction. Side soft-tissue neck radiographs may show the classic "thumbprint" sign, yet this imaging technique has inadequate sensitivity ⁽⁷⁾. Bedside ultrasound and also CT could also be taken into consideration as adjunctive screening ⁽⁸⁾. Imaging technique ought to be chosen on the basis of medical concern and also consideration of alternative diagnoses. For example, CT imaging might be used in secure patients in which problems such as retropharyngeal abscesses are of problem. Analysis imaging must not postpone respiratory tract intervention in people with

breathing distress. Etiology is multifactorial and also could consist of non-infectious and infectious entities ⁽⁹⁾. Infectious etiologies are believed to be microbial, viral, or fungal microorganisms ⁽⁹⁾. Feasible microbial virus consists of Streptococcus pyogenes, pneumonia, Staphylococcus aureus, and H flu, amongst one more respiratory flora ^(9,10).

- **Radiological and laboratory tests for medical diagnosis of epiglottitis:**

Anteroposterior radiographs of the neck are helpful in ruling and also confirming the medical diagnosis out the possibility of an international body in the respiratory tract. In croup, the supraglottic structures as well as epiglottic darkness are regular, while there is obscuring of the tracheal air darkness and also symmetric constricting of the subglottic air darkness, which creates the particular "church steeple" sign on anteroposterior movies.

In intense epiglottitis, the radiological "thumb indication" (**Figure 1**) is a measure of severe swelling of the epiglottis with possibility for irrevocable loss of the airway. Difficulty in breathing and stridor prevail signs of epiglottitis in children, however are less frequent in adults.

One of the most typical providing sign in adults is odynophagia (100%), followed by dysphagia (85%) as well as voice modification (75%) ⁽²⁾. In grownups, stridor is regarded as an indication for occlusion of the top air passage. Stridor, tachycardia, tachypnea, rapid beginning of signs and symptoms and a "thumb-sign" existing in 79% of the instances on side X-rays of the neck are significant predictors for unavoidable airway concession with rapid scientific degeneration ⁽¹³⁾.



Figure 1: The radiological “thumb sign” in acute epiglottitis

Research laboratory examinations are generally not practical in picking up the medical diagnosis. In the lack of a positive radiological finding, executing an adaptable fiberoptic laryngoscopy in a regulated professional setting for a trustworthy, prompt medical diagnosis could be indicated. Because of the risk of causing laryngeal spasm and/or total respiratory tract obstruction, assessment of the throat and also throat must be tried only in a location with appropriate equipment as well as staff prepared to interfere need to top respiratory tract obstruction create, preferably, in the operating room. Ultrasonography has been referred to as a means to check out

the epiglottis by visualization of the "alphabet P indicator" in a longitudinal sight via the thyrohyoid membrane (**Figure 2**)⁽¹⁴⁾.

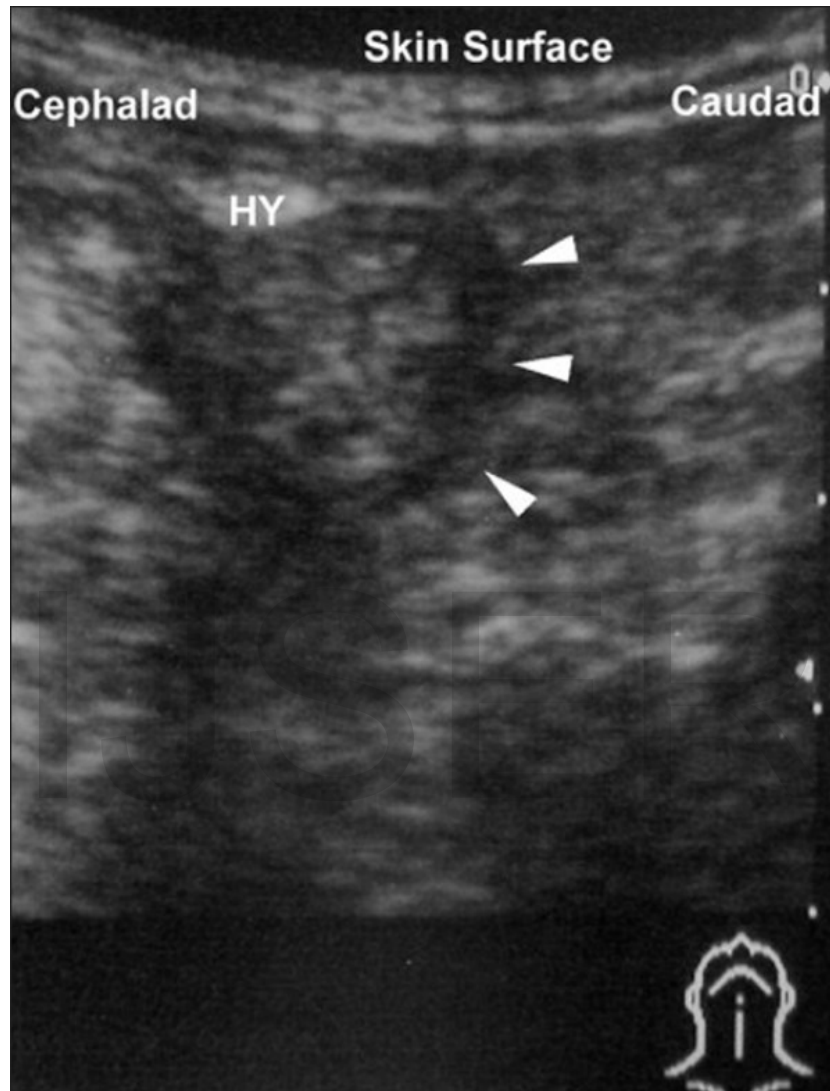


Figure 2: "Alphabet P sign" formed by acoustic shadow of hyoid bone (HY), swollen epiglottis (pointed by white arrows).

There are myriad records on the changing bacteriology of epiglottitis; a lot of these records concentrate on a certain cohort of clients, either within one nation, one geographic area, or a details age of individuals^(15,16,17). It has actually been suggested that widespread use the Hib vaccine would basically eliminate or significantly decrease epiglottitis⁽¹⁸⁾; this was forecasted

based on addition of the Hib vaccine right into the youth vaccination programs and also by extrapolation from worldwide examples ⁽¹⁸⁾. In the United States, the Hib vaccination is part of the American Academy of Pediatrics advised childhood vaccination timetable, beginning at 2 months old. According to the World Health Organization, in 2003, 92% of the populaces of established nations were vaccinated against Hib ⁽¹⁹⁾.

○ Treatment of Epiglottitis:

Treatment is fixated airway administration. One retrospective testimonial in 2010 disclosed that 13.2% of individuals identified with epiglottitis called for intubation whereas 3.6% needed tracheostomy ^(4,11). Antibiotics are the essential of first treatment with steroids considered potential adjuncts. Antimicrobial therapy needs to be tailored to the most common etiologies and also resistance patterns, with a third-generation cephalosporin usually advised as single therapy ^(4,9). Vancomycin should be carried out if methicillin-resistant *S. aureus* is thought about ⁽²⁾. Steroid usage is controversial, however some studies have actually shown that steroids contribute to a shorter size of remain in the healthcare facility and also ICU ⁽²⁾. Bronchodilators, such as racemic epinephrine, have actually not been shown to be reliable in acute epiglottitis yet may be thought about in individuals with impending respiratory tract blockage while planning for

respiratory tract treatment ⁽²⁰⁾. Racemic epinephrine ought to not be made use of in children because it might create agitation and also promote laryngospasm ⁽²¹⁾. Care needs to additionally be made use of in elderly individuals or in those for which there is issue for myocardial anemia or arrhythmia ⁽²²⁾. Encouraging care together with airway observation in the ICU suffices for the management of many individuals with epiglottitis.⁴ However, cautious planning for safeguarding the airway is critical because client decompensation may require immediate life-saving treatment ⁽²⁾. Respiratory tract administration must entail preparation for surgical air passage with recognition of sites and also skin cleaning. Due to the fact that putting the person supine aggravates respiratory tract obstruction ⁽²³⁾, the patient should be maintained in an upright position at first. Visualization of the singing cables should be obtained in a regulated setup, making use of awake intubation to allow for spontaneous air flow during intubation efforts ⁽²⁴⁾. Paralysis could worsen blockage. Fiberoptic or videolaryngoscopy needs to be thought about ^(2,23,24). The medical professional needs to be quick to acknowledge futile attempts at supraglottic intubations and do cricothyrotomy in an expedited fashion ⁽²⁾.

CT check has currently been described as a vital step in the administration of these patients ⁽²⁵⁾. It can be done after intubation or after beneficial evolution of respiratory system signs. In our study, around 20% of clients called for surgical treatment for abscess drainage whereas fifty percent of the CT scans revealed signs of collected infection. This rate is greater than formerly published ^(11,25). Because of an unforeseeable illness progression as well as unpredictable respiratory system feature, unanswered inquiries remain concerning the timing of imaging studies as well as monitoring of abscesses.

Patients with signs of a progressing upper respiratory tract blockage, regular with an intense epiglottitis, ought to be dealt with as a medical and also an airway emergency situation. In the presence of respiratory system distress, diagnostic treatments and radiography are not suggested, and also safeguarding the air passage needs to be focused on. Tracheal intubation of a client with epiglottitis have to be regarded as a potentially challenging treatment (**Figure 3**)⁽²⁵⁾. It must be carried out in rigorous monitored problems, i.e. in the operating room, while preserving spontaneous air flow. The readiness of a team capable of carrying out a prompt tracheotomy needs to be verified. The client should be transferred to the operating room under the supervision of an experienced anesthesiologist as well as surgeon. The induction may be performed with the individual resting upright. Compelling the child/patient right into a supine setting could precipitate intense respiratory tract obstruction. Anesthetic induction with accomplishment of a deep degree of anesthetic and maintenance of spontaneous ventilation has been referred to as the method of selection. The quantity of time required to produce deep anesthesia making use of an inhalation induction might be raised secondary to air passage obstruction and also might require boosting gas concentration. Capnography with breathed out gas analysis is useful in determining anesthetic depth. Muscle mass depressants are avoided and also spontaneous ventilation ought to be kept. In case of the medical diagnosis of epiglottitis, a fiberoptic nasal intubation or stiff bronchoscopy making use of an endotracheal tube with considerably lowered size is favored. The person must be transferred sedated to a critical care unit (ICU) after safeguarding the respiratory tract. Intravenous sedation should preferably enable spontaneous air flow. Tracheal extubation ought to be come before by a cuff leakage examination with a deflated cuff as well as, generally, a review by straight laryngoscopy with deep sedation or basic anesthesia. Difficulties of acute epiglottitis may consist of deep neck room infection, frequent health problem and also vocal

granuloma ⁽²⁶⁾. Dexamethasone therapy or budesonide aerosols could be utilized in an attempt to restrict pharyngeal edema and thereby lower the blockage. Making use of corticosteroids has been associated with shorter ICU and total size of stay, with a typical total size of keep of 3.8 days in grownups ⁽⁹⁾.

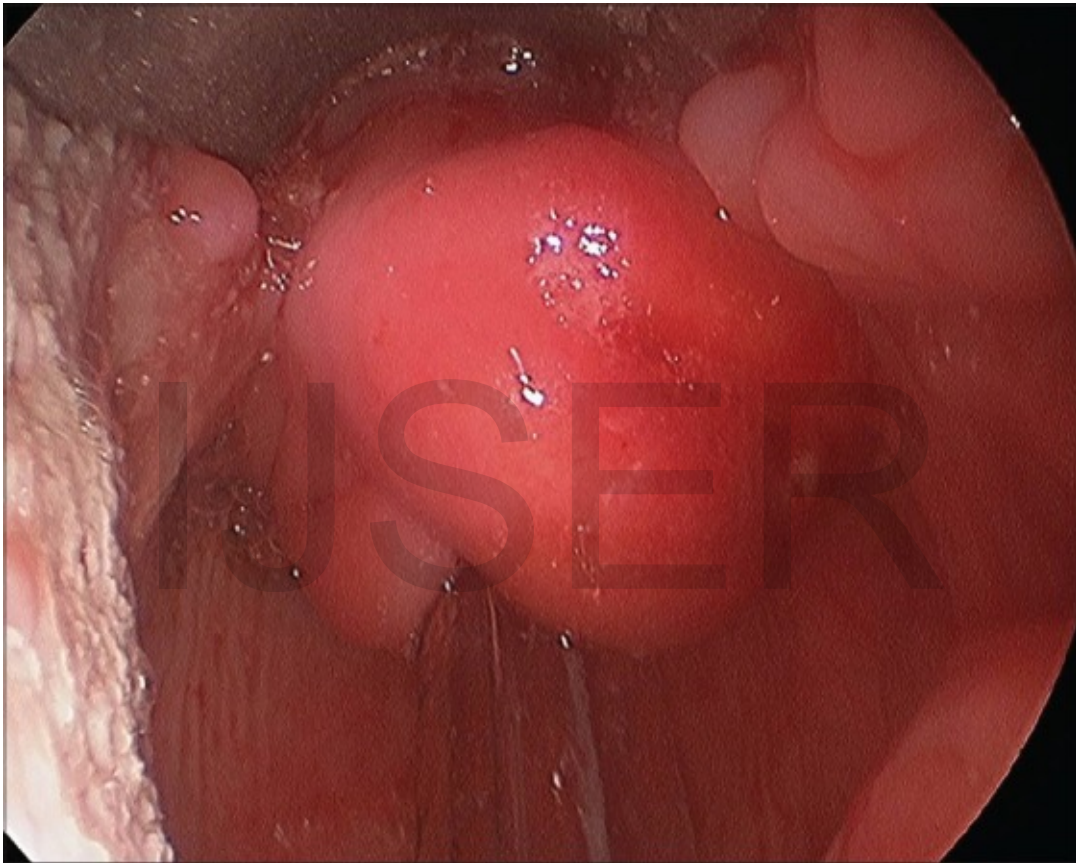


Figure 3: Inflammatory edema of the arytenoids, aryepiglottic folds and the epiglottis

 **Conclusion:**

Epiglottitis is a life-threatening disorder with major effects to the anesthesiologist as a result of the potential for laryngospasm and unalterable loss of the respiratory tract. Severe epiglottitis could happen at any age. Early diagnosis with careful as well as quick intervention of this severe problem is essential to avoid deadly difficulties. The suitable analysis test for the diagnosis of epiglottitis would be basic, rapid, noninvasive, as well as very accurate, carried out at the bedside, as well as would certainly not use ionizing radiation.

References:

1. Suzuki S, Yasunaga H, Matsui H, Fushimi K, Yamasoba T. Factors associated with severe epiglottitis in adults: analysis of a Japanese inpatient database. *Laryngoscope*. 2015 Sep;125(9):2072–8.
2. Guardiani E, Bliss M, Harley E. Supraglottitis in the era following widespread immunization against *Haemophilus influenzae* type B: evolving principles in diagnosis and management. *Laryngoscope*. 2010 Nov;120(11):2183–8.
3. Chroboczek T, Cour M, Hernu R, et al. Long-term outcome of critically ill adult patients with acute epiglottitis. *PLoS One*. 2015 May 6;10(5):e0125736.

4. Briem B, Thorvardarson O, Petersen H. Acute epiglottitis in Iceland from 1983–2005. *Laeknabladid*. 2010;96: 405–411.
5. Price IM, Preyra I, Fernandes CM, Woolfrey K, Worster A. Adult epiglottitis: a five-year retrospective chart review in a major urban centre. *CJEM*. 2005;7: 387–390.
6. Wood N, Menzies R, McIntyre P. Epiglottitis in Sydney before and after the introduction of vaccination against Haemophilus influenza type b disease. *Intern Med J*. 2005;35: 530–535.
7. Ng HL, Sin LM, Li MF, Que TL, Anandaciva S. Acute epiglottitis in adults: a retrospective review of 106 patients in Hong Kong. *Emerg Med J*. 2008;25: 253–255.
8. Cheung CSK, Man SY, Graham CA, Mak PS, Cheung PS, Chan BC, et al. Adult epiglottitis: 6 years' experience in a university teaching hospital in Hong Kong. *Eur J Emerg Med*. 2009;16: 221–226.
9. Chang YL, Lo SH, Wang PC, Shu YH. Adult acute epiglottitis: experiences in a Taiwanese setting. *Otolaryngol Head Neck Surg*. 2005;132: 689–693.
10. Sarkar S, Roychoudhury A, Roychaudhuri BK. Acute epiglottitis in adults—a recent review in an Indian hospital. *Indian J Otolaryngol Head Neck Surg*. 2009;61: 197–199.
11. Bizaki AJ, Numminen J, Vasama JP, Larane J, Rautiainen M. Acute supraglottitis in adults in Finland: review and analysis of 308 cases. *Laryngoscope*. 2011;121: 2107–2113.
12. Shah RK, Stocks C. Epiglottitis in the United States: national trends, variances, prognosis, and management. *Laryngoscope*. 2010;120: 1256–1262.

13. Chan KO, Pang YT, Tan KK. Acute epiglottitis in the tropics: Is it an adult disease? *J Laryngol Otol.* 2001;115:715–8.
14. Hung TY, Li S, Chen PS, Wu LT, Yang YJ, Tseng LM, et al. Bedside ultrasonography as a safe and effective tool to diagnose acute epiglottitis. *Am J Emerg Med.* 2011;29:359.e1–3. Epub 2010 Aug 1.
15. Shah RK, Roberson DW, Jones DT. Epiglottitis in the *Haemophilus influenzae* type B vaccine era: changing trends. *Laryngoscope* 2004;114:557–560.
16. Senior BA, Radkowski D, MacArthur C, Sprecher RC, Jones D. Changing patterns in pediatric supraglottitis: a multiinstitutional review, 1980 to 1992. *Laryngoscope* 1994; 104:1314–1322.
17. Thoon KC, Chong CY, Ng WY, Kilgore PE, Nyambat B. Epidemiology of invasive *Haemophilus influenzae* type b disease in Singapore children, 1994–2003. *Vaccine* 2007;25: 6482–6489.
18. Takala AK, Peltola H, Eskola J. Disappearance of epiglottitis during large-scale vaccination with *Haemophilus influenzae* type B conjugate vaccine among children in Finland. *Laryngoscope* 1994;104:731–735.
19. American Academy of Pediatrics Web site. Available at: <http://www.cispimmunize.org>. Accessed July 14, 2017.
20. Sobol SE, Zapata S. Epiglottitis and croup. *Otolaryngol Clin North Am.* 2008 Jun;41(3):551–66. ix.
21. Mandal A, Kabra SK, Lodha R. Upper airway obstruction in children. *Indian J Pediatr.* 2015 Aug;82(8):737–44.

22. Wiebe K, Rowe BH. Nebulized racemic epinephrine used in the treatment of severe asthmatic exacerbation: a case report and literature review. *CJEM*. 2007 Jul;9(4):304–8.
23. Vermelis AM, Mateijsen N, Giebelen D, Meeusen V, Wong DT, van Zundert AA. Successful use of videolaryngoscopy in an adult patient with acute epiglottitis: a case report. *Acta Anaesthesiol Belg*. 2010;61(2):67–70.
24. Riffat F, Jefferson N, Bari N, McGuinness J. Acute supraglottitis in adults. *Ann Otol Rhinol Laryngol*. 2011 May;120(5):296–9.
25. Lee YC, Kim TH, Eun YG. Routine computerized tomography in patients with acute supraglottitis for the diagnosis of epiglottic abscess: is it necessary? A case prospective, multicenter study. *Clin Otolaryngol*. 2013;38: 142–147.
26. Mathoera RB, Wever PC, van Dorsten FR, Balter SG, de Jager CP. Epiglottitis in the adult patient. *Neth J Med*. 2008;66: 373–377.

IJSER