Pediatric Case of Ludwig’s Angina (LA), Pakistan

Rafia Jabbar1, Rijaa Zaheer1, Agha Aftab Hussain2, Anjum Naveed3

1Resident Pediatric Medicine Indus Hospital & Health network, Pakistan
2Registrar department of otolaryngology, Indus hospital and health network, Pakistan
3Senior Consultant, Department of otolaryngology, Indus Hospital & Health network, Pakistan

ABSTRACT

Ludwig’s Angina (LA) is a severe form of infection which spread rapidly, effecting submandibular, sub lingual and sub maxillary spaces resulting state of emergency. We report a case of Ludwig’s angina in a 12-month-old female with a literature review and presentation, etiology, management, and potential complications of this in pediatric cases.

Introduction

Ludwig’s angina is a potentially life-threatening cellulitis of floor of mouth and tongue which rapidly progresses and becomes hard and inflexible. Ludwig’s angina, is named after German physician Wilhelm Fredrick von Ludwig who first described this in 1836. Due to the possible complications associated with Ludwig’s angina immediate identification and management is required. (1)

Case Report

We report a case of a previously healthy well-nourished and vaccinated 12-month-old female brought to pediatric Emergency department with complain of left sided submandibular swelling which was observed 8 days back along with fever and cough, swelling rapidly progressed to submental area in a day (figure-1). There is no history of drooling, odynophagia, shortness of breath, cyanosis. Child was partially vaccinated with proper dentition. On physical examination child was febrile (38 ° C), heart rate was 120 beats/min, respiratory rate 30 breaths /min. oxygen saturation was 99% at room air. Examination of neck revealed midline swelling extending to the left submandibular region fluctuation was positive, oral cavity examination was normal. On the basis of this history and physical examination, diagnosis of Ludwig’s angina was made. Hemoglobin was 9.5g /dl, white blood cell count

Figure 1 : Patient At Presentation

DOI: 10.55920/JCRMHS.2022.01.001041
LA mostly affects adult population with poor dentition while incidence of LA in the pediatric population 27-30%. LA with identified odontogenic source only 50% of the cases in children but in adults incidence of odontogenic cause 70% to 90%. LA is two to three times more prevalent in boys (6). As many as 1 in 3 to 4 cases of Ludwig’s angina are reported to occur in children (3). Oral mucosa lacerations, submandibular sialadenitis (7) and mandibular fractures are other etiologic sources in children.11 children with systemic diseases, Tetralogy of Fallot herpetic gingivostomatitis, (8) tongue piercing and lymphatic vascular malformation superinfection as causative factors of LA have been reported. It can also occur without any predisposing or precipitating cause (6).

It is essential to know about the complex anatomy of head and neck for better understanding of the disease progression within the potential spaces of neck form by facial layers attachment to neck structures. The submandibular space, that is the primary site of LA is located above the hyoid bone. The superior border is formed by the mucosa of floor of mouth. It is divided superiorly into the sublingual space which is located between the geniohyoid and mylohyoid muscles and inferiorly into the submaxillary space located between the mylohyoid muscle and the superficial fascia and skin. Ludwig’s angina most frequently originates from the second or third mandibular molars (3) and extends into submaxillary space through extension below mylohyoid line. Involvement of floor of mouth displaces tongue posteriorly resulting in life threatening airway obstruction but due to hyoid bone it does not spread inferiorly but can present as on the anterior aspects of the neck resulting in bull neck. The infection spreads along the facial planes with tendency to involve parapharyngeal, retropharyngeal space, superior mediastinum and not via the lymphatic system (3).

Clinical presentation of LA can vary from focal to systemic signs and symptoms which include tongue, throat pain, dysphagia, trismus, dysphonia, drooling from mouth with fever, chills, malaise, decreased oral intake causing dehydration and toxic appearance. Usually have progressive bilateral submandibular and submental neck swelling which on local physical examination can be soft to firm, with or without fluctuation, warm, tender induration of the floor of the mouth and late presentation causes posterior and superior displacement of the tongue obstructing the airway with or without trismus (9). Severe Airway compromise can lead to respiratory symptoms like dyspnea, cyanosis, stridor, altered levels of consciousness, labored breathing and oxygen desaturation. LA mostly diagnosed clinically as in our case. If a child comes with firm edematous tongue or floor of the mouth with neck swelling below the mandible than pediatrician must suspect LA as these are the cardinal signs of progression to airway obstruction. (10)

Variations of clinical features and severity with time of presentation, atypical cases without predisposing cause can delay the diagnosis and increase mortality. Mostly fever and neck swelling with bilateral submandibular swelling and elevation of the tongue are the presenting complains (10) like in our case. Plain neck-and-chest radiographs can help
in diagnosis showing swelling, airway compression. Unstable or patient unable to lie supine point-of-care sonographs give the details of collection while computed tomography (CT) scan is recommended before surgical intervention in stable patient which will give information about the extent of soft-tissue inflammation and the infected spaces with respective anatomical location (7).

Organisms isolated from bacterial cultures after surgical drainage of Ludwig’s abscesses usually showed mixed growth of both aerobic and anaerobic bacteria, including streptococcus, staphylococcus, and Bacteroides. The predominant microorganisms isolated from the discharge after Incision and drainage in pediatric Ludwig’s angina cases most commonly is Streptococcus species (10) which is reported 40% (3). In our case MRSA was isolated. Other isolates include gram-negative rods 25% and anaerobes were found 20% of cases while 35% of blood cultures in same patient series came positive. Septic shock can develop after the surgical drainage which was not seen in our case and few Patients may require a second operation to improve the drainage. (10) Admission with close monitoring is important as sequelae of sepsis and progression in severity can develop in any patient.

Emergency and timely consultation is of prime importance for the management of Ludwig’s angina, immediate initiation of medical therapy is crucial. Early airway establishment via endotracheal tube or tracheostomy is recommended in case of deterioration or signs of airway obstruction(3). Although changes in anatomy of airway and mobility of tissue creates difficulty in intubation, in certain cases there are chances of complete airway obstruction with the induction of general anesthesia. (11). Team of emergency tracheostomy must always be present during intubation process.

Depending upon the causative organism antibiotic is indicated, severely immunocompromised patients should be treated against methicillin-resistant S. Aureus and resistant gram-negative bacteria. Commonly used antibiotics are high-dose penicillin G, along with metronidazole. In patients who are allergic to penicillin, an alternate is clindamycin hydrochloride. (10) The role of steroids has been reviewed in a study using dexamethasone, even then surgery was required in 27 out of 31 patient cases. (12).

CONCLUSION

Ludwig’s angina can be a lethal disease with its rare occurrence leading to inadequate emergency department experience. It can progress to rapid airway obstruction so in order to prevent Ludwig’s angina early recognition and immediate treatment by pediatric emergency, anesthetic and otolaryngology team is required.

Declaration of patient consent

The authors certify that they have obtained all appropriate consent forms from patients’ attendant. In the form the patient(s) attendant has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The parents understand that their child’s names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Declaration of interest: None

Financial Disclosures: None

Authors Contribution: All authors gave final approval of this manuscript

References