

Pharyngolaryngeal Edema as a Rare Complication of Mumps Infection: A Case Report

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ABSTRACT

Background: Mumps is an acute viral infection characterized by painful swelling of the parotid glands. Although most infections are mild and self-limiting, systemic complications such as orchitis, meningitis, and pancreatitis are widely recognized, whereas upper airway involvement in the form of pharyngolaryngeal edema with supraglottic swelling is an exceedingly rare yet potentially life-threatening complication. The authors report this case to highlight the importance of vigilance for airway involvement in adult mumps and the role of flexible laryngoscopy in early detection.

Case Presentation: A 40-year-old immunocompetent man presented to the emergency department with progressive facial and neck swelling of one day's duration, accompanied by voice change and a sensation of breathing difficulty. Mumps was diagnosed clinically on the basis of bilateral parotid swelling, sialadenitis on contrast-enhanced neck computed tomography (CT), and a laboratory profile consistent with a viral process. Flexible laryngoscopy confirmed supraglottic edema with an airway patency of approximately 80%. The patient was initially managed with intravenous non-steroidal anti-inflammatory therapy and supplemental oxygen, but deteriorated and was transferred to the intensive care unit, where therapy was

escalated to intravenous dexamethasone and nebulized epinephrine. He improved within 48 hours and was discharged without requiring intubation or tracheostomy.

Conclusion: Pharyngolaryngeal edema is a rare but potentially fatal complication of mumps owing to airway obstruction. Clinicians should perform early flexible laryngoscopy in any patient with mumps who reports voice change or breathing difficulty, regardless of vaccination status, since delayed recognition may result in respiratory failure. Multidisciplinary management with intravenous corticosteroids as the mainstay of therapy, supported by readiness for a surgical airway as a contingency, proved effective in averting invasive intervention in this case.

Keywords: mumps; pharyngolaryngeal edema; supraglottic edema; upper airway obstruction; laryngoscopy

INTRODUCTION

Mumps is an acute, contagious viral infection caused by the mumps virus, a member of the genus Rubulavirus within the family Paramyxoviridae. The virus is transmitted through respiratory droplets and direct contact with the saliva of infected individuals, and preferentially targets glandular and neural tissue. The parotid gland is the most commonly affected site, producing the painful, pathognomonic

bilateral parotid swelling known as parotitis⁽¹⁾. Although mumps is generally regarded as a childhood disease, it may affect adolescents and adults, particularly in the setting of waning immunity or suboptimal vaccination coverage⁽²⁾.

In most cases, mumps is self-limiting and resolves within one to two weeks. Nevertheless, systemic complications are well recognized and include orchitis (occurring in up to 20–50% of postpubertal males), oophoritis, aseptic meningitis, encephalitis, sensorineural hearing loss, and pancreatitis^(3,4). The most frequent complication in adult males is orchitis, which may lead to testicular atrophy in up to 35% of affected cases^(4,5). Measles-mumps-rubella (MMR) vaccination has substantially reduced the incidence of mumps worldwide; nevertheless, outbreaks continue to be reported even in populations with high vaccination coverage⁽²⁾.

Mumps is usually diagnosed clinically in patients with the characteristic features of parotitis, particularly in an outbreak setting. Laboratory confirmation is recommended for atypical presentations, in previously vaccinated individuals, and for the purposes of public health surveillance. The gold-standard diagnostic method is detection of mumps virus RNA by reverse transcription polymerase chain reaction (RT-PCR) from buccal or oral swab specimens⁽¹⁾. Serologic testing for mumps-specific immunoglobulin M (IgM) antibodies may serve as a complementary approach, although its sensitivity is lower in individuals who have previously received MMR vaccination⁽⁶⁾.

Upper airway involvement in mumps infection is exceedingly rare. Among the rare complications reported, pharyngolaryngeal edema—manifesting as supraglottic swelling—is a potentially serious condition that may cause progressive airway obstruction and respiratory distress⁽⁷⁾. Ishida et al. reported three adult cases of supraglottic edema associated with mumps infection, confirming that airway compromise is a recognized, albeit uncommon, complication⁽⁷⁾. Another case

report has also described laryngeal edema in the context of mumps-related submandibular sialadenitis, with contiguous soft-tissue spread proposed as the underlying mechanism⁽⁸⁾.

Given the rarity of this complication and its potential to cause rapid, life-threatening airway compromise, early recognition of pharyngolaryngeal edema as a manifestation of mumps infection is of considerable clinical importance. In this report, the authors describe a case of mumps infection manifesting as pharyngolaryngeal edema in a 40-year-old man, and discuss the clinical presentation, diagnostic pathway, and management strategy in the context of previously published cases.

CASE REPORT

A 40-year-old immunocompetent man presented to the emergency department of BIMC Kuta Surgical Specialty Hospital with a chief complaint of facial and neck swelling, followed by shortness of breath beginning one day prior to admission. He also reported difficulty breathing and hoarseness. He denied cough, coryza, odynophagia, and fever. There was no relevant past medical history, and he denied any history of surgery or drug allergy. There was no family history of similar complaints. His vaccination history was complete, including the MMR vaccine, as ascertained at the initial assessment.

On initial evaluation, the patient was fully alert (Glasgow Coma Scale). Vital signs were within normal limits: blood pressure 122/78 mmHg, pulse 88 beats per minute, respiratory rate 18 breaths per minute, oxygen saturation 97% on room air, and temperature 36.8°C. Physical examination revealed diffuse, firm swelling of the lower facial region, predominantly over the mandibular and parotid areas. Bilateral submandibular fullness was palpable. No cervical lymphadenopathy or neck stiffness was appreciated, and the trachea was in the midline.

RESULT

Laboratory investigations showed findings consistent with a viral infectious process, namely mild leukocytosis with a slightly elevated C-reactive protein (CRP) level of 5.9 mg/L. Serum urea, creatinine, and electrolyte levels were within normal limits. Contrast-enhanced neck CT demonstrated bilateral enlargement of the parotid and submandibular glands with heterogeneous contrast enhancement and surrounding fat

stranding, consistent with sialadenitis (Figure 1). Coronal CT sections also showed symmetrical right-to-left soft-tissue enlargement at the parotid level (Figure 2). Several lymph nodes were visible in cervical regions IIa and IIb, together with extensive soft-tissue swelling of the maxillofacial and cervical regions. Chest radiography (Figure 3) showed clear lung fields with no evidence of consolidation or pneumothorax.

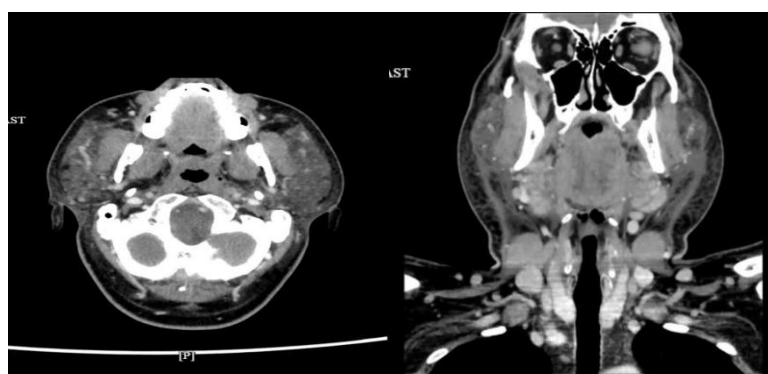


Figure 1 (left): Axial contrast-enhanced neck CT showing bilateral parotid and submandibular gland enlargement with heterogeneous enhancement and surrounding fat stranding. Figure 2 (right): Coronal contrast-enhanced neck CT showing symmetrical soft-tissue enlargement at the parotid level.



Figure 3: Chest radiograph showing clear lung fields without consolidation or pneumothorax.

Based on the clinical presentation, laboratory results, and radiologic findings, a working diagnosis of mumps infection was established, with differential diagnoses including Ludwig angina, submandibular cellulitis, abscess, and allergic reaction. These differential diagnoses were excluded on the basis of the absence of floor-of-mouth swelling, the absence of fluctuance, normal inflammatory markers without neutrophilia, and the absence of any identifiable allergen. Accordingly, the patient was advised to be admitted for airway observation. During observation in the general ward, flexible

nasopharyngolaryngoscopy was performed by the otorhinolaryngology–head and neck surgery (ORL-HNS) team. The examination revealed pooling of foamy secretions in the pharynx together with marked erythema and edema of the supraglottic structures, involving the epiglottis and the aryepiglottic folds. The airway lumen was estimated to be approximately 80% patent, with no apparent subglottic involvement (Figure 4).

The patient was started on intravenous non-steroidal anti-inflammatory therapy, namely parecoxib 40 mg every 12 hours, together with supplemental oxygen therapy. He was

closely monitored for signs of progressive airway deterioration. Subsequently, his hoarseness and throat discomfort worsened, and oxygen saturation, initially 96–97% on room air, abruptly fell below 90%. The patient was then transferred to the intensive care unit (ICU) for continuous airway monitoring by the intensivist and ORL-HNS teams. At that point, therapy was escalated to intravenous dexamethasone for the supraglottic edema, given as a 5 mg stat dose followed by the same dose every 8 hours, together with nebulized epinephrine 1 mL in 5 mL of normal saline every 24 hours. Preparations for emergency airway management were also placed on standby.

The patient's condition improved progressively over the following 48 hours. Repeat flexible laryngoscopy showed a marked reduction in supraglottic edema and erythema, with resolution of the pooled secretions (Figure 5). The hoarseness resolved, and no further episodes of respiratory distress were reported. The patient was subsequently stepped down from the ICU and then discharged in stable condition on a tapering course of oral corticosteroids together with symptomatic analgesia. Neither tracheostomy nor intubation was required. Follow-up was scheduled at the outpatient clinic.

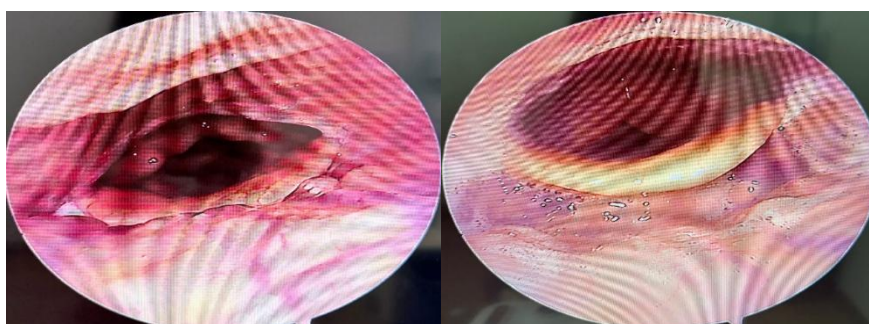


Figure 4 (left): Flexible laryngoscopy at presentation showing foamy secretions with erythema and edema of the epiglottis and aryepiglottic folds, with approximately 80% airway patency.

Figure 5 (right): Repeat flexible laryngoscopy after 48 hours of therapy showing marked reduction of supraglottic edema and erythema with resolution of secretion pooling.

DISCUSSION

This case illustrates an exceedingly rare but potentially life-threatening complication of mumps infection, namely pharyngolaryngeal edema with supraglottic involvement. Although the classic presentation of mumps is parotid gland enlargement, which is generally self-limiting, clinicians must maintain a high index of suspicion for upper airway complications, particularly in adult patients, who may present with atypical or severe manifestations.

The pathophysiology of pharyngolaryngeal edema in mumps is not fully understood. The mumps virus is thought to be able to directly infect the mucous membranes of the upper respiratory tract, triggering a local inflammatory response that results in pharyngeal and laryngeal edema ⁽⁷⁾. Contiguous spread of inflammation from the

parotid and submandibular glands to the surrounding cervical and pharyngeal tissues is also believed to contribute to airway compromise, as has been described in case reports involving the parotid and submandibular glands ⁽⁸⁾. Lymphatic obstruction due to reactive cervical lymphadenopathy has also been proposed as an additional contributing mechanism.

Ishida et al. were the first to systematically describe supraglottic edema as a complication of mumps infection in adults, reporting three cases of epiglottic and supraglottic edema identified by laryngoscopy and CT imaging ⁽⁷⁾. More recently, Ogawa et al. reported a case of mumps with unilateral submandibular sialadenitis accompanied by laryngeal edema, emphasizing that submandibular gland involvement may be a risk factor for

laryngeal edema⁽⁸⁾. Both reports are consistent with the presentation in the present case and support the need for early laryngoscopic evaluation in patients with mumps who develop respiratory symptoms. The clinical presentation in this patient was characterized by progressive facial and neck swelling, voice change, and a subjective sensation of dyspnea—features consistent with mild to moderate supraglottic edema. The absence of fever and the relatively modest inflammatory markers were consistent with a viral rather than bacterial etiology. Importantly, performing flexible laryngoscopy early proved crucial in objectively determining the degree of airway compromise and in guiding management decisions. Flexible laryngoscopy is regarded as an essential diagnostic tool in the evaluation of supraglottic pathology, allowing real-time assessment of airway patency and helping to define the threshold for ICU-level monitoring⁽⁹⁾.

From a radiologic standpoint, neck CT imaging plays a complementary role in assessing the extent of glandular involvement and soft-tissue edema, and in excluding differential diagnoses such as deep neck space infection or abscess formation. The CT findings in this patient—bilateral sialadenitis, reactive lymphadenopathy, and diffuse cervical soft-tissue swelling—are consistent with the imaging features previously reported in mumps-related deep neck space edema^(7,8). However, CT depicts the dynamic degree of airway narrowing less accurately, so that endoscopic assessment remains irreplaceable.

Management of mumps-related pharyngolaryngeal edema is largely supportive, as no specific antiviral agent has been proven effective against the mumps virus. Corticosteroids are the mainstay of treatment for significant airway edema because of their potent anti-inflammatory properties. Intravenous dexamethasone has been used widely in the management of supraglottic edema of various etiologies and is the standard of care in acute adult supraglottitis⁽⁹⁾. Nebulized epinephrine

provides temporary improvement through local vasoconstriction and is recognized as a useful adjunctive therapy in upper airway obstruction, including croup as well as laryngeal edema in adult patients in the intensive care setting, where the combination of intravenous corticosteroids and nebulized epinephrine (commonly 1 mg in 5 mL) is the treatment of choice^(10,11).

Allergy/angioedema was excluded as a differential diagnosis on the basis of the symmetrical swelling pattern confined to the bilateral parotid glands—distinct from the classic angioedema pattern, which usually involves the lips, tongue, or periorbital region—the evolution of the illness over days (rather than the acute onset within minutes to hours seen in anaphylaxis), the absence of urticaria or any history of new allergen exposure, and a clinical response consistent with an infectious inflammatory process following corticosteroid administration. It should be noted that in this case corticosteroids were not given at the outset, but rather as an escalation after the initial approach with intravenous non-steroidal anti-inflammatory drugs was judged to have produced inadequate improvement. This decision was based on the initial assessment that the supraglottic edema was still mild (estimated airway patency of approximately 80%) without signs of acute respiratory distress, so that a conservative approach was attempted before escalation to systemic corticosteroids and nebulized epinephrine. However, the clinical deterioration that occurred over a relatively short interval in this case underscores that the threshold for initiating intravenous corticosteroids should be considered earlier in patients with progressive supraglottic edema, in line with the literature positioning corticosteroids as the standard of care in acute adult supraglottitis.

ICU admission in this case was appropriate and is justified by the risk of rapid airway deterioration. In the case series reported by Ishida et al., all three patients with mumps-related supraglottic edema responded well to conservative management including

corticosteroids, and none required tracheostomy⁽⁷⁾. In the present patient, close serial monitoring and timely corticosteroid escalation likewise succeeded in avoiding the need for invasive airway management. Nevertheless, clinicians must remain prepared for emergency airway intervention, as deterioration may occur rapidly and unpredictably in progressive supraglottic edema.

From a public health perspective, this case reinforces the importance of maintaining high MMR vaccination coverage. Waning immunity has been implicated in recurrent mumps outbreaks in various countries, including in populations with high two-dose MMR vaccination coverage^(2,6).

This case is subject to the limitations inherent to a single case report. Generalizations regarding the optimal management algorithm or the long-term outcome of mumps-related pharyngolaryngeal edema cannot be drawn from a single case. In addition, RT-PCR confirmation was not performed at the initial evaluation; although the available findings were consistent with acute infection, serologic testing may have lower sensitivity in previously vaccinated individuals⁽⁶⁾. Future prospective case series are needed to better characterize this rare complication and to establish evidence-based management guidelines.

CONCLUSION

Pharyngolaryngeal edema is an exceedingly rare but clinically significant complication of mumps infection, with the potential to cause life-threatening airway obstruction. This case underscores the need to maintain a broad differential diagnosis in patients with painful cervicofacial swelling and respiratory symptoms, particularly when accompanied by parotid gland enlargement. Flexible laryngoscopy is an essential diagnostic tool for objective airway assessment. A multidisciplinary approach involving otorhinolaryngology and intensive care is recommended, with early administration of intravenous corticosteroids and nebulized

epinephrine as the principal therapeutic strategy.

It is further recommended that surgical airway management be kept prepared as a contingency, and that clinicians lower their threshold for escalating corticosteroid therapy in progressive supraglottic edema. Clinicians should remain vigilant for upper airway complications in adult patients with mumps, regardless of vaccination history, as delayed recognition may culminate in fatal respiratory failure.

Declaration by Authors

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