The Role of Systemic Condition in the Management of Maxillofacial Infections

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Received: 17 July 2010 / Accepted: 14 October 2010 / Published online: 25 March 2011
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Abstract Ludwig's Angina is a rare type of facial infection which formerly invariably was fatal but now with adequate surgical and antibiotic treatment has a much reduced mortality. In spite of the recent advances in therapy, rare and potentially life threatening complications may still arise from time to time and as a result account for significant morbidity and mortality. A case of Ludwig's angina reported at A.B Shetty Memorial Institute of Dental Sciences, Mangalore, India resulting in fatality, in spite of surgical and antibiotic treatment, due to underlying systemic condition and involvement of multiple resistant organisms. The condition was worsened by subsequent esophageal rupture and death occurred due to multiple organ failure.

Keywords Infection · Fatal · Systemic · Ludwig's angina

Case Report

In November 2009, 31 year old male was admitted to the emergency department of A.B Shetty Memorial Institute of Dental Sciences, Mangalore referred from a government health care centre with complain of pain and swelling on the face since 5 days associated with fever, dyspnea and dysphagia.

He gave a history of dental pain 2 years back in left lower posterior region for which restoration was given by a

local dental surgeon. He gave history of pain at same site since 2 weeks for which he had taken oral analgesics. Patient was admitted in local hospital and was treated with i/v antibiotics, analgesics and i/v fluids. Later patient was referred to our hospital for further management.

Patient gave history of RTA 13 years back following which he had weakness in right upper limb and left lower limb. He gave history of tobacco chewing since 7 years.

On admission patient was conscious but drowsy (GCS = E4 V4 M6; 14/15), hypoxic, restless and afebrile with restricted mouth opening. On examination, there was bilateral submandibular and submental swelling present encroaching superiorly up to lower one-third of the face and inferiorly up to anterior region of the neck (Fig. 1). Swelling was extending up to pre-auricular region on the right side and post-auricular region on the left side. The overlying skin was erythematous and there was local rise in the temperature. On intra-oral examination, floor of the mouth was raised. Mouth opening was approximately 1 cm. Grossly decayed teeth were present in relation to 36 and 37 region associated with pus discharge. On radiographic examination, periapical radiolucency was noted in relation to 37.

Oxygen therapy and fluid replacement with crystalloids was commenced. CT scan was not done as patient was hypoxic and was immediately planned for surgical management [1]. Blood was withdrawn for routine hematological examination. Laboratory investigation reports showed total leukocyte count (TLC) and differential count (DC) within normal range. Inj. Cefazolin 1 gm i/v was given preoperatively. Tracheostomy was done and patient was intubated and anaesthetized through the stoma. Bilateral submandibular incisions were placed and foul smelling pus was drained. Pus was also drained from the pretracheal region through the tracheostomy incision (Fig. 2).

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Extraction of 36 and 37 was done and pus was drained through the socket also. Pus was sent for culture and sensitivity testing. Extraoral incisions were explored and loosely closed with corrugated drain in situ.

Post-operatively initial antibiotic therapy was started with Cephalosporins, Metronidazole and Amikacin. Culture and sensitivity report showed the presence of Gram negative bacilli, *Pseudomonas* and *Klebsiella*, and fungi. Appropriate antibiotics and antifungal drugs were administered based on the sensitivity. Patient developed fever on the seventh post-operative day with was managed with anti-pyretic drug. TLC and DC repeated on seventh and 11th post-operative day were within normal limits. Blood sample collected for protein estimation on ninth post-operative day showed decrease total protein and albumin levels.

Inspite of all medical and surgical measures there was persistent discharge noted from the extraoral wound and no improvement in the patient's condition hence patient was shifted to ICU. During the ICU stay patient's condition progressively deteriorated due to presence of numerous complications such as, necrotizing fascitis in the extraoral wound and stoma region [2], oro-cutaneous fistula formation, pitting edema on limbs, esophageal rupture, hypoalbuminemia, pulmonary infiltration and neck rigidity (Figs. 3, 4).

In the later stages samples taken from the extraoral wound had shown no bacterial growth. Patient's condition was worsened by liver failure, hypoxic encephalopathy, respiratory alkalosis and hypokalemia. Patient developed cardiac arrest after 19 days. Patient was put on ventilator and was given cardiac support using atropine, dopamine, and noradrenalin. All possible measures were taken to improve patient's general and systemic condition including nutritional support with total parenteral nutrition, packed cell infusion and blood transfusion. Patient's general

Fig. 1 Pre-operative photograph

Fig. 2 Surgical procedure

Fig. 3 Morbid condition

Fig. 4 Persistent discharge from the fistula

condition failed to improve inspite of all supportive measures. Unfortunately the patient succumbed 25 days after admission due to multiple organ damage and cardiac arrest (Fig. 5).

Discussion

This patient had the classical signs of Ludwig's angina with involvement of pretracheal space. Inspite of intensive medical and surgical therapy, there was not much improvement in the patient's general condition. At the time of admission patient was afebrile which may be due to the fact that he was receiving antibiotics and anti-inflammatory drugs since 5 days in local hospital. Post-operatively also patient had only one episode of fever. Although, there were

Fig. 5 Necrotizing fascitis and orocutaneous fistula

no bacterial growth seen in the samples taken from the extraoral wound at later stages [3]. The patient's delay in seeking adequate medical attention as well as his general debility due to alcoholic liver disease had a major role in causing his death.

Parapharyngeal space and pretracheal spaces occupies a pivotal position in the neck, communicating directly with major fascial spaces. Extension of the infection from the spaces had caused damage to the esophageal and pharyngeal wall, leading to leakage of contents from esophagus, pharynx and oral cavity.

Although life-threatening complications of dental infections are rare in contemporary practice, the clinician must remain cognizant of these possibilities. Local

manifestations of these infections become significantly attenuated and the systemic conditions might be overlooked. As in this case the underlying liver disease resulted in progressive deterioration in the patient's condition in spite of the therapy.

Antibiotic therapy has resulted in significant alteration in the microbiology of head and neck space infections. β -Hemolytic streptococci were almost universally found as the etiologic agent before the advent of antibiotics. Currently gram negative bacteria and mixed cultures including fungi are common.

Death in case of head and neck space infections can occur due to erosion of carotid artery, septicemia [4], cavernous sinus thrombosis, thrombophlebitis of internal jugular vein, and mediastinitis [5].

In spite of antibiotic therapy and surgical intervention, mortality in a patient with underlying systemic condition can occur sometimes. Therefore, it is utmost important to identify and manage the systemic condition of the patient along with the local manifestations.

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