

## Medical Emergencies in Dental Office: An Overview

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### Abstract

Medical emergency is a condition occurring in dental office due to various factors. The review highlights few of emergency that can occur in office with their management to make the dental practitioners aware about the situation.

**Keywords:** Medical Emergencies; Dental

### Introduction

An emergency may be a medical condition that demands immediate attention and successful management. These are the life-threatening situations of which every practitioner must be aware of so that needless morbidity can be avoided [1].

Every dentist should have the essential knowledge to acknowledge, assess and manage a potentially life-threatening situation until the patient are often transported to a medical facility. Successful patient management relies on understanding the pathophysiologic processes and how to correct them [2]. Studies have found that half of all patients treated in a dental school have at least one chronic disease or condition [3,4].

The most common medical emergencies are syncope, adverse reactions to LA, grand mal seizures, angina pectoris, and hypoglycemia [5,6].

A dentist must be familiar with the prevention diagnosis and management of common emergencies. He/she should be adequately trained so that they know what to do and act promptly in case of an untoward event. This review aims to discuss the various emergencies encountered by a dentist in his office and how to recognize, respond and effectively manage a medical emergency.

In spite of all of the technology available today, history is still the mainstay of diagnosis. The impact of social, environmental, hereditary and behavioral factors on patient well-being and illness must be realized in the patient's history [7]. Previous research has shown that physicians make a diagnosis from the patient's history in 70 - 90% of cases, i.e., while medical students consider the correct diagnosis based on the chief complaint or the history in 70% of cases [8].

A person's medical record is formed from many various pieces of data that tells the entire story that individual's current and past health. A complete medical history record should include information [9] Diagnosis, Known Allergies, Current Medications, Past and Present Illnesses, Medication History, Current Doctors, Emergency Contact Information – Previous Surgeries, Previous Hospitalizations, Family Medical History, Immunization Records Insurance Information [9].

### Syncope

Syncope (Greek, 'syn' means 'with', 'koptein' means 'to cut' or 'to interrupt') is a symptom. SYNCOPE, is defined as a sudden loss of consciousness associated with the inability to maintain postural tone, followed by spontaneous recovery, is relatively common [6,10].

## The symptoms can be divided under three phases

### Presyncope

The period when the body experiences lack of nutrition and oxygen by inadequate cerebral circulation. Early manifestations include a pale or ashen complexion with the skin possibly cool, and/or moist (“a cold sweat”). The victim might describe a feeling of warmth in the head and neck, lightheadedness, or dizziness; and may also feel nauseated, complain of numbness or tingling in the toes and fingers etc. Some people say they feel bad, or that everything is going dark just before losing consciousness. Fainting can occur without warning [11].

### Syncope

The amount when the victim actually loses consciousness. Bradycardia, hypotension, and a weak, thread pulse is common. Unconsciousness leads to muscular relaxation and therefore the possibility of an obstructed or partially obstructed airway, thanks to a decrease in muscular tonus which will cause the tongue to fall into the oropharynx. Another effect of this muscular relaxation may be fecal incontinence [11].

### Postsyncope

Period that happens because the victim returns to consciousness and therefore the pulse, pulse, and cerebral nutrition return to normal. During this point, the victim is more likely to reexperience syncope if raised from the supine position too quickly, or allowed to face timely after the episode or shown any visually disturbing triggers for example syringe, blood soaked cotton etc [11].

### The management includes

- Positioning: no premature sitting of patient, Trendelenburg position, and supine preferred. In Pregnancy lateral decubitus preferred [12].
  - Relief from compression on the neck. Try to Revive the Person by taping briskly.
  - Evaluate and maintain Airway, breathing, circulation. If absent, begin CPR. Call local emergency number. Continue CPR until help arrives or the person responds and begins to breathe.
  - If the person is breathing, restore blood flow to the brain by raising the person’s legs above heart level — about 12 inches (30 centimeters) - if possible.
  - Give supplemental oxygen.
  - When consciousness is regained, patient should be kept flat and reassured. If the person doesn’t regain consciousness within one minute, call local emergency number.
- Once pulse and blood pressure recover, slowly raise patient to seated position. Fruit juices or glucose water can be administered orally until person recovers completely.
  - Patients with significant medical problems, or when syncope is prolonged or complicated by seizure activity, should be transferred to a hospital environment for further assessment [12].

### After the management

If recovery from syncope takes longer than five minutes after positioning and/or if complete recovery does not occur in 15 to 20 minutes, another possible cause of unconsciousness should be considered and definitive management should be started including summoning emergency medical services. The patient is referred to the hospital [8].

### Respiratory emergencies

Acute Respiratory Failure (ARF) is defined as the inability of the respiratory system to exchange gases and to oxygenate the blood adequately. We can distinguish two mechanisms at the basis of ARF [13,14]:

1. Failure in pulmonary ventilation (pump failure) due to neuromuscular diseases, chest wall deformities, obstructive pulmonary diseases.
2. Failure in gas exchanges (lung failure) due to different pathologies Adult acute respiratory distress syndrome, Neonatal respiratory distress syndrome, Acute cardiogenic pulmonary oedema.

### Clinical evaluation

A patient with ARF usually presents with signs of respiratory distress: dyspnoea, cyanosis, tachypnea, accessory muscle use, paradoxical breathing and tachycardia. Primary care physician must apply the algorithm A-B-C-D, so as to exclude an Acute Upper Airway Obstruction (AUAO), first of all, then he must operate as following [15].

1. He has to administer high flows of oxygen, to measure blood pressure, to take heart rate, respiratory rate, oxygen saturation, to make an electrocardiogram [15]. Moreover he has got to take a blood gas sample and a peripheral blood sample to guage CK, CKMB, T-troponine, LDH, AST, ALT and hem chrome.
2. At the same time he must evaluate the neurological state, in order to call for the resuscitator if Kelly score is more than 3.15.

- If neurological state isn't compromised patient are often managed by emergency physician, entirely.

### Asthma

Condition caused by an allergic reaction resulting in widespread narrowing of the bronchial airways. Asthma is very common medical condition and can be triggered by many things, including dust, traffic fumes, pollen, stress and even the weather. An asthma attack occurs as a result of being exposed to an asthma trigger, which causes the small airways (the bronchi and bronchioles) become narrower, or constricted, making breathing more difficult [16].

### Signs and symptoms

- Difficulty breathing, Coughing, Wheezing Difficulty in speaking (will need to take breaths during a sentence), Pale, clammy skin, Grey or blue lips and skin (cyanosis).
- Use of accessory muscles (in the neck and upper chest) to breath, Loss of consciousness. In the initial stages of an asthma attack, the respiration rate may actually rise. The casualty.
- Will also have an increased heart rate (tachycardia).
- When a severe asthma attack is not treated successfully the casualty will become exhausted and this will result in life threatening asthma(status asthmaticus). Cyanosis will become apparent and therefore the casualty will develop a slow heart beat (bradycardia).

### Management

The most effective way of getting a drug to the airways is to inhale it. Most asthmatics carry their bronchodilator inhalers or "relievers" with them. The most commonly used contain salbutamol or terbutaline and are usually blue.

There should always be a blue reliever inhaler in the emergency drug box and this should be readily available for use [16].

Sit the casualty upright, leaning on the wall or a chair, if necessary (the dental chair is ideal). Help them to use their inhaler. (It is much easier to administer the drug successfully if they can do this themselves). Two "puffs" should be administered initially, (the dose of salbutamol is 100mcg per puff) but this can be repeated every few minutes if the attack does not ease.

Oxygen must also be administered, using the non-rebreathing face mask [15].

### Post-extraction bleeding

Post-extraction bleeding (PEB) may be a recognized, frequently encountered complication in practice, which is defined as bleeding that continues beyond 8 to 12 hours after dental extraction. The incidence of post-extraction bleeding varies from 0% to 26%. If post extraction bleeding isn't managed, complications can range from soft tissue haematomas to severe blood loss. Local causes of bleeding include soft tissue and bone bleeding. Systemic causes include platelet problems, coagulation disorders or excessive fibrinolysis, and inherited or acquired problems [16].

Clinically overt sign of recurrent haemorrhage should be considered because the presence of aggressive oozing haemorrhage that continuously fills the mouth or the formation of "liver clot" or "currant jelly clot", which is a dark red, jelly-like mass that forms over the tooth socket without actually stopping the bleeding. This blood clot mass tends to increase gradually in size as the socket continues to ooze blood underneath it. If the "liver clot" is ruptured, the socket restarts aggressively oozing blood until a replacement one is made, and so on. Repetition of this situation and ingestion of large amounts of blood or clots may cause nausea and vomiting [17].

It is also vital that each one patients should be told about mild oozing which will be experienced during the primary post-operative hours which this is often an anticipated phenomenon for which they have nothing to worry about. Patients should comprehensively be told about which situations might be considered alarming, like recurrent aggressive oozing, formation of "liver clot", neck swelling or dyscataposa (difficulty in swallowing) [18-20].

Management involves pressing surgical gauze or a cotton roll into the socket with pressure applied by the patient biting on it. If this fails then the gum is anaesthetised and a horizontal mattress suture placed [21].

### Several agents that may help

**haemostasis are available to the dental practitioner. These include**

- v Tranexamic acid;
- v Ferric sulphate [22].

Using a small piece of Surgicel (haemostatic cellulose) wrapped around a Toothette (a pink put on a stick wont to provide moisture to patients who are unable to swallow), the haemostatic matrix can be delivered directly to a bleeding socket as it clings well to the sponge. The sponge itself can then be easily bitten down on by the patient and moulds to the socket, in contrast to the uncomfortable bulkiness of gauze [23].

Bone wax consists of beeswax, paraffin and a softening agent. It may be wont to control bleeding within cancellous bone.

### Anaphylactic shock

Anaphylactic shock is defined as an acute, potentially life-threatening hypersensitivity, involving the discharge of mediators from mast cells, basophils and recruited inflammatory cells. This condition is clinically presented by many signs and symptoms. Anaphylaxis occurs in a private after reexposure to an antigen to which that person has produced a selected IgE antibody. The antigen to which one produces an IgE antibody response that leads to an allergic reaction is called an allergen [24].

### Symptoms

The acute phase may develop within minutes as anaphylactic shock involving the skin and mucosal reactions like hives, flushing, and swollen lips-tongue-uvula followed by respiratory complications like dyspnea, wheeze, bronchospasm, stridor, hypoxemia, hypotonia [collapse], syncope, incontinence. Blood pressure level also decreases in acute stages. The previous reviews show that reduced BP after the exposure to an allergen (minutes to several hours) in Infants and children: low systolic BP (age specific) or > 30% decrease in systolic BP and in Adults: systolic BP < 90 mmHg or > 30% decrease from that person's baseline [25].

### Treatment in an emergency

#### Rapid assessment

- **Airway:** Search for and relieve airway obstruction; involve help early if there are signs of obstruction. Remove any traces of allergen remaining. Give high-flow oxygen employing a mask with an oxygen reservoir.
- **Breathing:** Search for and treat bronchospasm and signs of respiratory distress.
- **Circulation:** Colour, pulse and blood pressure (BP).
- **Disability:** Assess whether responding or unconscious.

- **Exposure:** Assess skin with adequate exposure, but avoid excess heat loss. Consider anaphylaxis when there's compatible history of rapid onset of severe allergic-type of reaction with respiratory difficulty and/or hypotension, especially if there are skin changes present [26]. Pharmacotherapy includes Epinephrine/Adrenaline, Supplemental Oxygen, Intravenous Fluid Challenge, Bronchodilators, Antihistamines, corticosteroids [27].

### Diabetes

Diabetes mellitus (DM) is one among the foremost frequent pathologies that dentists encounter. Its clinical importance springs from the possible occurrence of acute complications, whose severity could mean an immediate risk for the diabetic patient's life and require urgent diagnosis and treatment [28].

### Hyperglycaemia

Clinical symptoms include thirst, increased urine output and dehydration, and also, there may be hypotension, progressive reduction in level of consciousness, coma or cessation of urinary output in severe cases.

### Management

Primary assessment and resuscitation (DRS-ABC) is to secure the airway, breathing and circulation. Then transport to a hospital facility.

### Hypoglycaemia

Clinical symptoms of hypoglycaemia include sweating, hunger, tremor, agitation, with progressive drowsiness, confusion and coma. Assume any diabetic with impaired consciousness has hypoglycaemia until proven otherwise.

### Management

Conscious patients can usually be treated with rapid acting oral carbohydrates, e.g. fruit juice, packets of granulated sugar, glucose powder dissolved in water. After 10minutes this short acting carbohydrate should be followed up with food which contains longer acting carbohydrate. The victim should not be left alone until all the dangers of hypoglycaemia are resolved. If the patient is unconscious, attend to the airway, breathing and circulation. Protect the victim from more injury and activate the EMS [29].

## Conclusion

These are few of medical emergencies occurring in a dental office which are common. An early detection and detailed history of patient can save both patient and dentist from any unfavorable situation.

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