

치과진료실에서의 응급처치

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김 현 정

Goals

- Develop a sense of vigilance and anticipation
- Enable you to respond to an urgent medical need in a reasonably confident and efficient fashion

By Malamed SF

- It is estimated that about 90% of urgencies - emergencies can be prevented.
- This means that 10% will occur in spite of our best efforts

To prepare...

- **Anticipation:**
History Taking and Physical Examination
- **Prevention:**
Recognize and Prevention
- **Planning:**
Practicing and Recalling

4 things to keep in your mind

1. Be Prepared
2. Well Self-trained
3. Don't Panic
4. Call for Help

Urgencies vs. Emergencies

- Urgency: a problem that requires prompt response; it is not immediately life threatening but could become so if not resolved promptly
 - Syncope
 - Hypoglycemia
 - Seizure
 - Asthmatic attack
 - Hyperventilation
 - Angina
 - Mild allergic reaction
 - Stroke
- Emergency: a problem that is immediately life threatening and requires immediate action
 - Cardiac arrest
 - Anaphylaxis
 - Obstructed airway

What Is Vital Condition

Breath and Pulsation

Respiratory Function
Cardiovascular Function
Neurological Function

Treatment

- Attend to the patient
 - If conscious, allow patient to assume a comfortable position, monitor vital signs, give oxygen as needed, try to determine what the problem is
 - If unconscious, P (position) ABCD
- Stay with the patient
- Call for help from your supervising faculty member (or any faculty member)
- If immediately life-threatening and additional help is needed, call 119 or 1339

Medical Emergencies Equipment in the Clinic

- Oxygen tank, ambu bag, tubing and mask
- Automated blood pressure cuff and pulse oximeter
- Drug box
- Defibrillator

Drug Box

- Aspirin
- Atropine
- Diphenhydramine
- Ephedrine
- Epinephrine
- Esmolol
- Flumazenil
- Glucose
- Hydrocortisone
- Labetalol
- Naloxone
- Nitroglycerine
- Salbutamol inhaler

Defibrillator

Common Medical Emergencies in the Dental Offices

1966 THROUGH 1974 COMPARATIVE MORTALITY RATES FOR DENTAL OFFICE ANESTHESIA

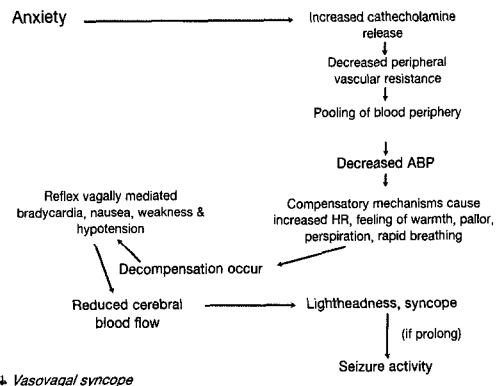
Event	General Anesthesia (n= 80,235)	Placental Sedation and Local Anesthesia (n = 97,375)	Neuroleptic and Local Anesthesia (n = 24,025)	Local Anesthesia (n = 178,647)	No Anesthesia (n = 278,757)
Syncope	1/400	1/262	1/360	1/160	1/1,555
Laryngospasm	1/485	1/834	0/34 0/75	0/178 647	0/278 757
Respiratory arrest	1/4 313	1/2 742	0/34 0/75	0/178 647	0/278 757
Asphyxiation associated with drug therapy	1/77 302	1/2 742	0/34 0/75	0/178 647	1/27 876
Cardiac arrest	1/48 155	1/9 566	0/34 0/75	1/10 509	1/49 918
Hypertension associated with drug therapy	1/3 355	1/3 638	0/34 0/75	1/15 729	0/278 757
Hypotension associated with drug therapy	1/4 806	1/19 392	0/34 0/75	1/44 462	1/278 757
Overdilatation associated with drug therapy	1/1 668	1/2 879	0/34 0/75	1/89 334	0/278 757
Death or severe injury associated with postural change during anesthesia	1/49 323	0/97 435	0/34 0/75	0/178 647	0/278 757
Flaccidus	1/651	1/758	0/34 0/75	0/178 647	0/278 757
Intra-vascular injection of medicine	1/40 323	1/28 787	0/34 0/75	1/89 334	0/278 757
Intra-arterial penetration of medicine	1/16 060	1/19 292	0/34 0/75	1/35 729	0/278 757
Respiratory arrest associated with aspiration	1/16 060	1/14 294	1/8 225	0/178 647	0/278 757
Aspiration of food or the rigid body	0/80 323	1/28 787	0/34 0/75	0/178 647	0/278 757
Fracture of teeth	0/160 323	0/97 375	0/34 0/75	0/178 647	1/278 757
Diabetic ketoacidosis	1/80 323	0/97 375	0/34 0/75	0/178 647	0/278 757
Complete heart block	0/80 323	0/97 375	0/34 0/75	1/178 647	1/278 757
Cardiovascular accident	0/80 323	0/97 375	0/34 0/75	0/178 647	1/278 757
Myocardial infarction	1/80 323	0/97 375	0/34 0/75	0/178 647	1/10 509
Acute respiratory distress	1/80 323	1/97 375	1/34 0/75	1/29 773	1/278 757
Myocardial hyperthermia	0/80 323	0/97 375	0/34 0/75	0/178 647	0/278 757

Benign syncope

- Vasovagal syncope
- Postural Hypotension

Vasovagal Syncope:

- Etiology: transient cerebral ischemia leading to loss of consciousness, often related to peripheral pooling of blood
- Physical findings:
 - Sudden loss of consciousness, pallor, nausea,
 - Irregular and decreased ventilation,
 - Hypotension and bradycardia,



Vasovagal Syncope:

- Management:
 - Place in comfortable position.
 - Establish a airway, oxygen supplement.
 - Administer reflex stimulants; Ammonia and cold compression.
- Prevention:
 - Minimize anxiety and stress.

Orthostatic hypotension:

- Etiology: pooling of blood in the periphery that is not remobilized quickly enough to prevent cerebral ischemia when a patient rapidly assumes an upright posture.
- Physical findings: palpitations and generalized weakness, feel lightheaded or become syncopal.

Orthostatic hypotension:

- Management:
 - Position patient in supine posture with legs raised above the level of the head.
 - Monitor vital signs.
- Prevention:
 - History taking.
 - Slowly return patient to sitting posture.

Differential Diagnosis

- Hyperventilation syndrome
- Hypoglycemia
- Hypothyroidism
- Stroke

Seizure:

- Etiology: paroxysmal neuronal discharge in the brain characterized by altered consciousness, uncoordinated muscle activity or abnormal sensory phenomena.
- Physical findings:
 - Tonic-clonic movements of trunk and extremities, loss of consciousness, vomiting, airway obstruction.

Seizure:

- Management:
 - Place patient supine position.
 - Suction and vital sign monitor.
 - Diazepam 5 mg IV.
 - BLS and transport if necessary.
- Prevention:
 - History taking.
 - Avoid toxic doses of local anesthetics.

Local Anesthetic Toxicity:

- Etiology: level of a narcotic resulting in blood level producing adverse reaction.
- Physical findings:
 - Talkativeness, anxiety, slurred speech, confusion.
 - Stuttering speech, nystagmus, tremors, headache, dizziness, blurred vision, drowsiness.
 - Seizure, cardiac dysrhythmia or arrest.

Local Anesthetic Toxicity:

- Management:
 - Monitor vital sign.
 - Administer oxygen.
 - Observe for 1 hour.
 - Diazepam (if convulsions occur)
 - BLS and transport.
- Prevention: dose of local anesthetics.

Pulmonary Foreign Body Aspiration in Dentistry

Foreign Body Aspiration (FBA)

- serious and potentially fatal
- Early diagnosis
 - Correct interpretation
 - integration of history
 - Physical examination
 - radiographic evidence

Epidemiology of tracheobronchial foreign bodies

- bimodal
- Children (1-3 yrs): grapes, pieces of hot dogs, peanuts, seeds, pieces of vegetables, and hazelnuts
- Elderly patients: neurologic disorders and decreased gag reflexes due to alcohol, seizures, strokes, parkinsonism, trauma, and senile dementia
- A third category of at-risk: sedation for dental procedures or emergency intubation

Mortality

- Annual death rates from aspiration of foreign bodies: 350-2000 in the US
- Most are children
- The most common etiology of aspiration deaths in children: a toy (29% of deaths)
- Foods most responsible for aspiration deaths in the US: hot dogs, candy, nuts, and grapes
- The mortality rate of tracheobronchial foreign body aspiration: approximately 1%

Nature of Foreign Bodies

Table 3—Nature of Foreign Bodies

Object	No. of Cases
Chicken bone	12
Fish bone	9
Fruit seed	5
Vegetable/corn	2
Pill	3
Tooth	5
Denture	4
Iron nail	1
Undetermined	2

Chen et al. Chest 1997; 112 (1): 129-33.

Symptoms & signs

Table 1—Symptoms

Symptom	Frequency (%)
Chronic cough	29 (67)
Hemoptysis/hemoptum	10 (23)
Fever	8 (19)
Dyspnea	7 (16)
Chest pain	3 (7)
Choking	3 (7)
Wheezing	1 (2)
Conscious disturbance	1 (2)

Chen et al. Chest 1997; 112 (1): 129-33.

Table 2—Findings of the Chest Radiographs

Findings	Cases (%)
Pneumonia/obstructive pneumonitis	12 (28)
Normal or unrelated findings	9 (21)
Foreign body	9 (21)
Atelectasis	7 (16)
Lung abscess	3 (7)
Nonspecific infiltration	3 (7)
Hyperinflation	1 (2)

The incidence of FBA in Dentistry

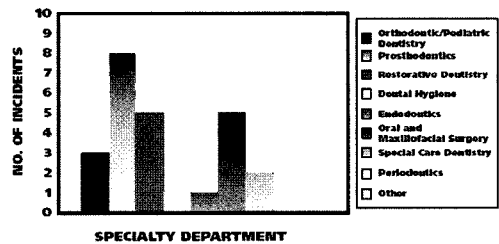


Figure 4. Number of Incidents by specialty department. The "Other" category

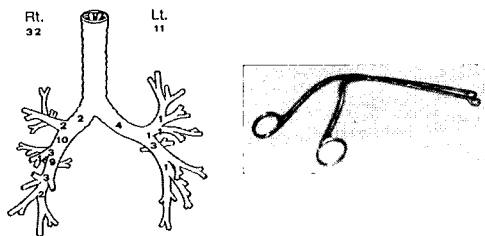


Figure 3 Location and frequency of foreign body

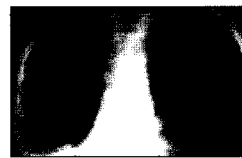
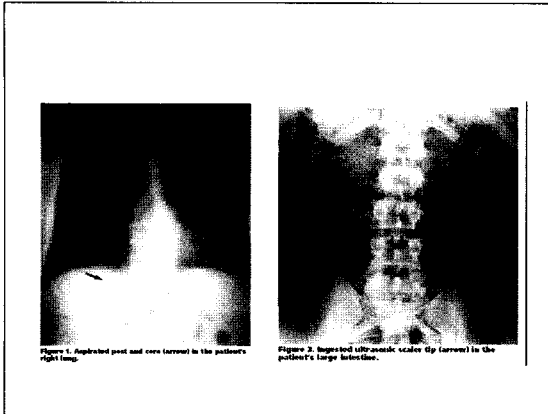


Figure 1: Anteroposterior chest radiograph showing a molar in the bronchus intermedius; atelectasis in the right-middle and lower lobe; and a mediastinal shift to the right.



Figure 2: The molar is at the centre of this lateral chest radiography; distal atelectasis is also apparent.



Increased risks for foreign body aspiration

- Children: during the exfoliation period of mobile deciduous teeth
- Elder patients with a decreased gag reflex or medical conditions like stroke, dementia and Parkinson's disease
- Use of local anesthetics
- Altered states of consciousness associated with intravenous sedation

Prevention of foreign body aspiration

- a rubber dam or gauze throat screen
- high-velocity evacuation
- Ligatures
- Tethering
- small instruments or clasps with floss
- if necessary, applying four-handed dentistry
- Chair position
- Prognosis: favorable

Chest Discomfort:
 --- AMI or angina pectoris

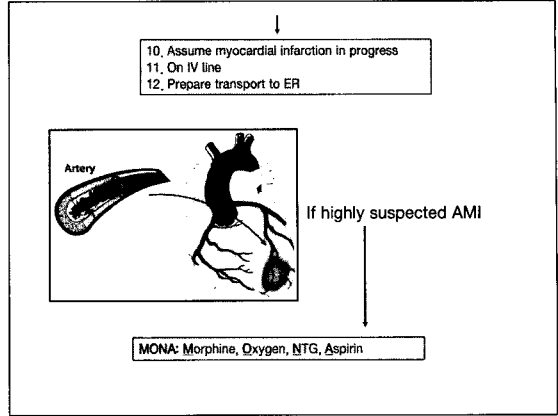
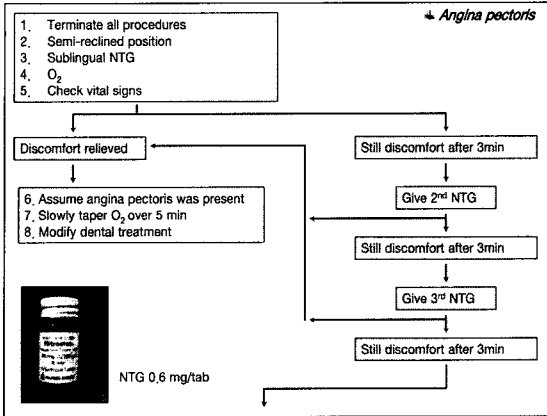
- Pain pattern
 - Characteristics: squeezing, bursting, pressing, burning or choking
 - Location: substernum
 - Refer pain: Lt shoulder, arm, neck or mandible
 - Associated with exertion, anxiety
 - Relieved by vasodilator (ex, NTG) or rest
 - May accompanied by dyspnea, nausea& vomiting sensation, palpitation

Differential Diagnosis of Acute Chest Pain: Common Causes

- Cardiovascular: angina pectoris, MI
- Gastrointestinal: dyspepsia (heart burn), hiatal hernia, reflux esophigitis, gastric ulcer
- Musculoskeletal: intercostal muscle spasm
- Psychologic: hyperventilation


Differential Diagnosis of Acute Chest Pain: Uncommon Causes

- Cardiovascular: pericarditis, dissecting aneurysm
- Respiratory: pulmonary embolism, pleuritis, tracheobronchitis, mediastinitis, pneumothorax
- Gastrointestinal: esophageal rupture, achalasia
- Musculoskeletal: chostochondritis
- Psychologic: psychogenic chest pain




Respiratory Difficulty:

- Asthma
- Hyperventilation
- Chronic obstructive pulmonary disease (COPD)
- Foreign body aspiration
- Gastric contents aspiration



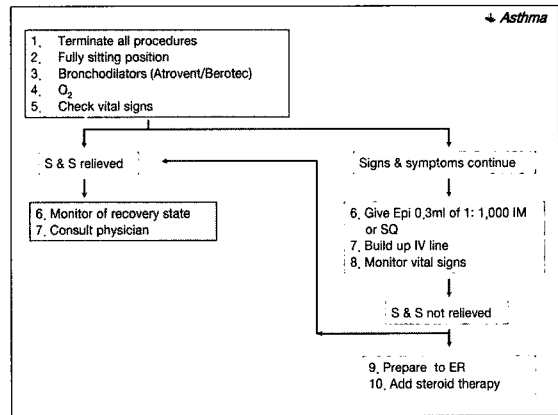
Manifestations of An Acute Asthmatic Episode:

- Mild to moderate
 - wheezing
 - dyspnea
 - tachycardia
 - coughing
 - anxiety



Manifestations of An Acute Asthmatic Episode:

- Severe
 - intense dyspnea with flaring of nostrils & use of accessory muscle
 - cyanosis of mucous membrane & nailbeds
 - minimal breathing sound on auscultation
 - flushing
 - extreme anxiety
 - mental confusion
 - perspiration



Manifestations of Seizure Attack:

- Isolated, brief seizure
 - tonic-clonic movement of trunk & extremities
 - loss of consciousness
 - vomiting
 - airway obstruction
 - loss of urinary & anal sphincter control
- Repeated or sustained seizure (status epileptics)

Hypersensitivity

- Etiology: caused by exposure to a particular antigen. Possible causative agents include antibiotics, analgesics, local anesthetics.
- Antigens trigger anaphylaxis when they combine with IgE antibodies on mast cells, resulting in a release of histamine into bloodstream and body tissues.

Hypersensitivity

- Physical findings:
 - Allergy: itching, urticaria, wheel, angioedema.
 - Anaphylaxis: dyspnea, wheezing, hypotension, laryngeal obstruction, dysrhythmia, cardiac arrest

Hypersensitivity

- Management:
 - Assess ABCs; Provide CPR,
 - Epinephrine: 0.3 ml of 1 : 1,000, IM or sublingually.
 - 100 % oxygen:
 - Hydrocortisone 100 mg IV or IM.
- Prevention: history taking.