



Second case:

Because of sever pain ..



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♥ **Key points from the Scenario:**

- Mansur ali , a 56-year old manager of bank.
- Brought by ambulance to the emergency department.
- Because of a sudden sever chest pain.
- He says “ I feel as if a **heavy stone is placed on my chest**.
- The pain has started about half an hour after talking to cust (also he feels the pain in his chin, both shoulders and on his arm)
- He feels sick.
- Although it is winter, his face is sweating a lot.
- He has been suffering from obesity since he was in primary school.
- He smokes 20 cigarettes per day for about 20 years.
- Last week, he took **antacid syrup** without seeking medical advice

♥ **Clinical examination :**

he was given a small dose of **morphine** (an analgesic) IV for his **chest pain**

♥ **Cardiovascular examination :**

- First and second heart sounds → normal
- Fourth heart sound → heard at the apex
- **No** cardiac murmurs
- ECG: **Raised** ST segment

investigation :

Vital signs:	(Mansur)	(Normal range)
Blood pressure	95/65	100/60-135/85 mmhg
Pulse	115 regular	60-100 / min
Respiratory rate	19	12-16 / min
Temperature	36.9	36.6-37.2 C

Blood test chemistry:

Blood test	Mansur result at 1 hour	Mansur result after 6 hour	Normal range
Creatine kinase (CK)	130	1400	30-200
Creatine kinase –MB isoenzyme (CK-MB)	4%	20%	<5%
Troponin T	0	0.25	0-0.03 ng/ml

Diagnosis :

atherosclerosis (**Myocardial infarction**)

Management :

is commenced on:

- **IV Heparin (inhibits further formation of blood thrombi)**
- **Ateplase (prevent recurrent thrombus formation)**
two drugs together work to maintain the flow of blood in coronary artery .
- **Glyceryl trinitrate** IV infusion (**opposes coronary spasm**)
- prepares him to join the cardiac rehabilitation program .
- surgical (**if its need**)

1. What is cholesterol ?

Cholesterol, a waxy (lipid) substance produced by the liver and found in certain foods, is needed to make vitamin D and some hormones, build cell walls, and create bile salts that help you digest fat.

2. What is Atherosclerosis ?

It's the term for the process of fatty substances, cholesterol, cellular waste products, calcium and fibrin (a clotting material in the blood) building up in the inner lining of an artery. The build up that results is called **plaque**.

Plaque may partially or totally block the blood's flow through an artery.

Two things that can happen where plaque occurs are:

- A piece of the plaque may break off.
- A blood clot (thrombus) may form on the plaque's surface.

If either of these occurs and blocks the whole artery, **Chest pain** begin and heart attack or stroke may result.

In cholesterol and atherosclerosis, there are good guys and bad guys:

Bad guys	Good guys
<p>LDL cholesterol sometimes is called "bad" cholesterol. A high LDL level leads to a build up of cholesterol in your arteries.</p>	<p>HDL cholesterol sometimes is called "good" cholesterol. This is because it carries cholesterol from other parts of your body back to your liver. Your liver removes the cholesterol from your body.</p>

Myocardial Infarction

If someone has a myocardial infarction (heart attack), a coronary artery or one of its smaller branches is suddenly blocked. The part of the heart muscle supplied by this artery loses its blood (and oxygen) supply if the vessel is blocked. This part of the heart muscle is at risk of dying unless the blockage is quickly removed. When a part of the heart muscle is damaged it is said to be **infarcted**.

Cardiac enzymes and markers for MI in plasma :

Myoglobin levels	Troponin T and I	Creatine Kinase (CK-MB)	Lactate dehydrogenase
Early marker (within 2 hours)	Appear in 3-4 hour and remain until 10 days	Appears within 4-6 hours (peak level in 12-24) and Returns to normal within 2-3 days	OBSOLETE marker

Troponins and **CK-MB** have high specificity and sensitivity for myocardial infarction

The risk factor for developing a cardiovascular disease :

- Diabetes mellitus
- High blood pressure
- High blood level of certain lipids (cholesterol, LDL and triglyceride)
- Low Blood level of HDL
- Obesity
- Advanced Age
- Family history of premature death
- Smoking cigarettes
- Lack of exercise

Assessment of pain:

S= site of pain – radiation

O = onset, when did start?

C = character of pain, type of pain?

R = radiation of pain, does the pain go anywhere else?

A = associated features

T = time, it is worse at any time of day?

Relation to movement or coughing

E = Exacerbating and relieving factors

S = severity on a scale from 1 to 10

Overall process :

Risk factors > atherosclerosis > Plaque rupture or Thrombus formation > Blocked artery > Myocardial Infarction

Symptoms of myocardial infarction :

- sudden sever chest pain :
chest pain due to ischemia (a lack of blood and hence oxygen supply) of heart muscle is termed angina pectoris .
- He feels sick :
feeling sick due to sever pain – increase sympathetic activity
- sweating a lot :
diaphoresis is also seen in an acute myocardial infarction , from increased firing of the sympathetic nervous system

Factors Affecting Coronary Blood Flow:

1. Autoregulation:

Flow is tightly coupled to oxygen demand.

2. Chemical factors:

- a. **Adenosine:** an important coronary vasodilator
- b. **Nitric oxide:** coronary vasodilator.
- c. **Other chemical factors:** hypoxia, excess CO₂, H⁺, lactic acid.

3. Nervous regulation:

- **Sympathetic activation :**
to the heart results in coronary contraction and increased coronary flow.
- **Parasympathetic activation:**
of the heart results in a significant decrease in myocardial oxygen demand due to a reduction in heart rate, and so decreases coronary blood flow.

What is Coronary angiography?

A test that uses dye and special x rays to show the insides of your coronary arteries that helps in assessing the functional status of the coronary circulation and whether the patient needs any surgical management.

New terms : ♥

plaque : a buildup of fatty, and deposits within the wall of an artery

feels sick : a feeling that he will vomit

antacid syrup : An **antacid** is a substance which neutralizes stomach acidity.

triglycerides : As a blood lipid, it helps enable the bidirectional transference of adipose fat and blood glucose from the liver

blood lipids : are lipids in the blood, either free or bound to other molecules

skin vesicles : small sac or cyst containing liquid or gas on skin

A defibrillator : is a common treatment for life-threatening cardiac dysrhythmias, ventricular fibrillation and pulseless ventricular tachycardia

Oximeter : a device that measures the oxygen saturation of arterial blood in a subject by utilizing a sensor attached typically to a finger

Cardiac monitor : The phrase **cardiac monitoring** generally refers to continuous monitoring of the heart activity , which monitors the pressure and flow of blood within the circulatory system

Morphine : analgesic drug used to relieve intense pain and suffering

ST segment : In electrocardiography, the **ST segment** connects the QRS complex and the T wave and has a duration of 0.080 to 0.120 sec

Myocardial ischemia : when blood flow to your heart muscle is decreased by a partial or complete blockage of your heart's arteries (coronary arteries). The decrease in blood flow reduces your heart's oxygen supply.

DEFIBRILLATOR



OXIMETER



CARDIAC MONITOR

