PBL Case
…(I love my Roller-Skiing)

New Terms

Osteomyelitis: *inflammation of bone or bone marrow, usually due to infection.*

Pathogenesis: *the development of disease.*

Practitioner: *a person actively engaged in a profession (especially health care)*

Limp: *a type of asymmetric abnormality of the gait (walk). Limping may be caused by pain, weakness, neuromuscular imbalance or a skeletal deformity. The most common underlying cause of a painful limp is physical trauma.*

History: *information obtained from the patient to aid in establishing a medical diagnosis & developing a treatment plan.*

Weight-bearing: *the ability of a part of the body to resist or support weight, also it's the amount of weight a person puts on his body or a part of it.*

Panadol: *a trademark for the acetaminophen (drug), it's therapeutic for analgesic (relieving and reducing pain) & antipyretic (preventing or reducing fever).*

Roller-skiing: *is a game with non-snow skate with wheels.*

Wound: *is a trauma (physical injury) which is an incision & injury to a part or a tissue of the body, happened by tearing, cutting, piercing (making holes) or breaking of the tissues.*

Fracture: *breaking or cracking to a tissue.*

Erosion: *eating or gnawing away, it happened by: friction to the surface of tissue (especially bone) or due to pressure, ulceration or trauma.*

Important notes

A complete blood count (CBC) : gives important information about the kinds and numbers of cells in the blood, especially red blood cells camera.gif, white blood cells camera.gif, and platelets. A CBC helps your doctor check any symptoms, such as weakness, fatigue, or bruising, you may have. A CBC also helps him or her diagnose conditions, such as anemia, infection, and many other disorders.

Periosteum : is a membrane that covers the outer surface of all bones except the articular surface. It provides attachment for muscles, tendons and ligaments. - Its outer surface: dense and contain large amount of blood vessels. - Its inner surface: more cellular, contains osteoblasts and fewer blood vessels.

Erythrocytes Sedimentation Rate (ESR):

The rate at which red blood cells sediment in a period of time. If the time is prolonged that means blood is viscous. For normal erythrocytes sedimentation rate is from 1-2 minutes more that this means inflammation or infection

C-reactive protein : is a protein found in the blood, the levels of which rise in response to inflammation, infection and presence of tissue damage and necrosis

Blood culture : microbiological culture of blood to detect infections. It the organism is detected, we should start searching for the suitable antibiotics.

MRI: medical imaging technique used in radiology to investigate the anatomy and function of the body in both health and disease base on the emission of electromagnetic wave. It relies on hydrogen in water. Major advantage of it is lack of X-ray (ionizing radiation).

HISTORY

(About Ali) :

- *7 years old*
- *Has a limp*
- *Has a fever*

His left leg:

1. *skin (reddish in color & swollen).*
2. *He jumps when trying to touch his leg.*
3. *Limping.*

A. Couldn't go to school & stayed in bed for the whole day (tired)
B. Didn't finish lunch & went to bed without dinner (loss of appetite)
C. His temperature was 38.5°C (up to the normal = 37.2°C – 36.6°C)
D. Took two spoonful of Panadol syrup but didn't help his fever.
E. Was feverish & sweating at night & this morning.
F. Fell about 2-3 weeks ago & had a small wound over his right elbow.
G. He Has NO sore throat, cough, diarrhea or pain on passing urine
H. He has no allergy, no medication, and no family history.

Clinical Examination

- *Ali looks unwell due to high temperature and high respiratory rate.*
- *Skin over the lower third of his left leg is swollen, red & warm to touch.*
- *Inflamed are is tender (soft & thin) to touch*
- *Two left inguinal lymph nodes (located in groin which is the area between the abdomen & the thigh) are swollen & tender.*
- *Normality in cardiovascular, respiratory and nervous systems.*
- *Report of x-ray shows no fractures or bone erosion*
- *The ankle joint is normal*

Diagnosis

Progress1:

1- doctor explains to Ali's mother that Ali may have infection in one of bones called (tibia) and surrounding tissue .

2- doctor adds the presence of fever, sweating , poor appetite , swollen , red and painful area of Lower part of his leg and also enlargement of lymph nodes in inguinal region that support Ali has infection.

3-X-ray shows there is no abnormality and no fractures .

4-An x-ray usually don't reveal the infection of the bone early in the diseases process …

5- doctor will use another imaging technique called MRI scan to confirm the presence of bone infection

Progress2:

1. *blood tests and MRI investigations can check if the there is infection .*
2. *CBC shows abnormality in WBC ,ESR and C-reactive protein .*
3. *Blood culture report shows Gram positive cocci are present in clusters .*
4. *The MRI confirm the presence of periosteal reaction approximately 3 cm above the left ankle joint and changes Supporting a diagnosis of osteomyelitis and the ankle joint is normal .*

Treatment

Case closure:

*1-Dr. Mona gives Ali an intravenous antibiotic called **Cloxacillin** and it is given every 6 hours.*

2-She explains the results of investigations to Ali parents.

3-She says the MRI scan and blood culture results support the diagnosis of osteomyelitis (bone infection) and blood culture helps in identifying the type of bacteria.

4-The bacteria is gram-positive known as staphylococcus aureus.

5-Some bacteria enter body by skin wounds so it possible that when Ali hurt his elbow.

6-Few weeks ago this bacteria which present on the skin , entered the body and reached the blood stream and finally settled in his tibia .

7-Over the next few days the redness and pain decreases and Ali feels much better , his body temperature is within the normal and he has no sweeting , his appetite has increased and back to normal and his discharged on day 5 on oral antibiotics.

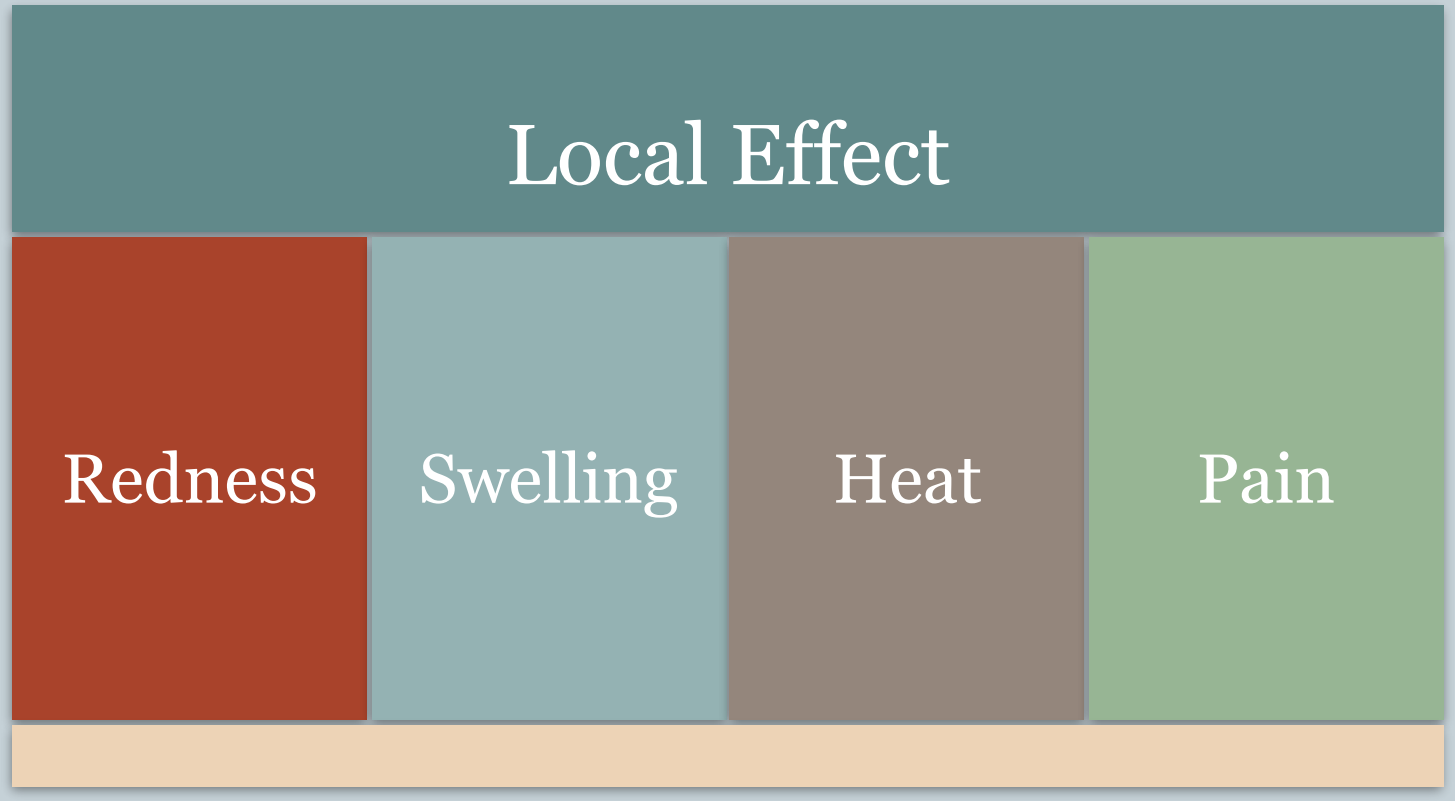
Notes

Infection: *is the invasion of a host organism's body tissues by disease-causing agents, their multiplication, and the reaction of host tissues to these organisms and the toxins they produce. Infectious diseases, also known as transmissible diseases or communicable diseases, comprise clinically evident illness*

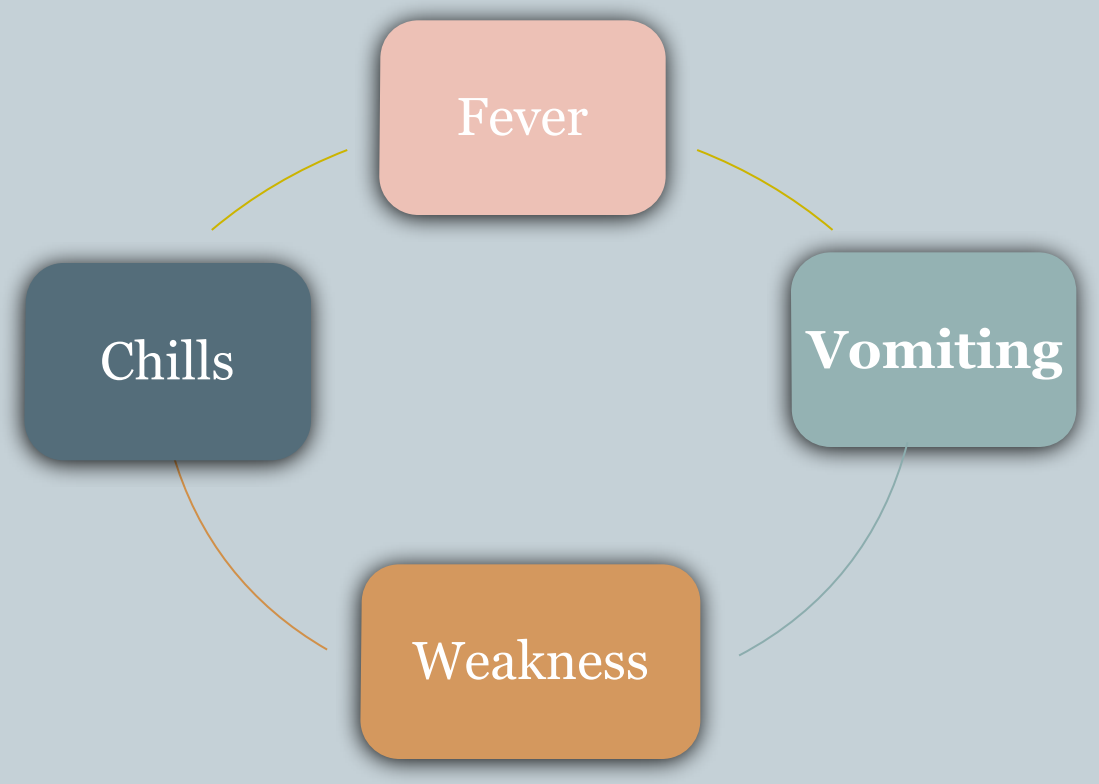
Inflammation: *a localized physical condition in which part of the body becomes reddened, swollen, hot, and often painful, especially as a reaction to injury or infection:*

Bacteria entered from skin wound in elbow then reached blood stream and finally settled in tibia and that's maybe because many factors including defense mechanisms

Clinical Feature of Inflammation



Systemic Effect



Causes of Inflammation

Trauma	Foreign Body	Immunological reaction	INFECTION

Possible questions

What are changes you have noticed in the CBC results ?

-Hemoglobin less than normal
-WBC increased (mainly neutrophils?)
-Platelet normal
-ESR more than normal
-CRP more than normal

What the difference between ESR and CRP?

ESR: rate at which of RBC settle out of suspension in blood plasma
And ESR increase as the plasma rises during diseases

CRP: a protein whose plasma concentrations are raised in infection and inflammation in presence of tissue damage and necrosis

Possible questions

In what way can the blood culture result of help ?

It's done for patients whom have blood infection symptoms . Blood will taken from the patient under aseptic conditions, then will be tested in laboratory to ***identify Microorganism*** *in the blood to determine antibody that treating infection.*

Best of luck!

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