**ORTHOPAEDIC DIAGNOSIS**

***د0عادل الهنداوي Licture-1-***

***Ortho*** = straight

***Paedic*** = child

Orthopedics is concerned with skeletal system and all that makes it move, including: bones, joints, muscles, tendons and nerves.

**Diseases affecting these structures could be:**

1- Congenital or developmental.

2- Infection or inflammation.

 3- Arthritis or rheumatic disorders.

 4- Metabolic or endocrine.

5- Tumours or lesions that mimic them.

6- Sensory disturbance & / or muscle weakness.

7- injury or mechanical disorders.

Diagnosis in orthopedics like all of medicine, depends on,

***History, physical examination***, ***imaging*** and ***special investigations***.

**History**:(symptoms):

Is very important, ask about: injury, pain, stiffness, swelling, deformity, instability, weakness, change in sensation and loss of function.

You have to know each symptom whether started suddenly or gradually; how it has progressed; what makes it worse; what makes it better. Also ask about past history (previous disease or injury), family history, work of the patient and general health.

**Physical examination**:

The patient should be subjected to general examination,

then examination of the gait, then examination of the

 affected part of the body, we have to uncover both limbs to compare:

 1- **look**: examine the skin, the shape and the position.

2- **feel**: feel the skin, soft tissue, pulse, bone and joint,

synovium, fluid in the joint and the site of tenderness.

3- **move**: ask the patient to do active movements, then you do

passive movement, then test for abnormal movement.

***Neurological examination:***look at the general appearance, the

motor function (tone, power and reflexes)and the sensory

function.

***Imaging:***

**I- Plain X-ray**:

For accurate diagnosis, it is better to

apply the: *Rule* *of two*:

***1***- Two views: some fractures or dislocations can not be

seen in one view, so take at least AP and Lateral views.

***2***- Two joints: one above and one below e.g. displaced

fracture of the ulna may be associated with radial head dislocation which if not x-rayed, would be missed.

***3***- Two limbs: for comparison especially in children.

***4***- Two injuries: e.g. fracture of calcaneum may

 be associated with spine fracture.

***5***- Two occasions: e.g. scaphoid # may

need 2 weeks to be visible on x-ray.

**II- X-ray using contrast media:** sinography, arthrography &myelography.

**III–Tomography:**

**IV- CT scanning:.**with or without contrast to see any done lesion or mass

**V- MRI**;. It's useful for early diagnosis of bone

ischemia,necrosis,investigations of spinal disorders,

cartilage and ligamentous injuries .

**VI- Ultrasound**;. Some times in cystic lesions abscesses.

**VII-Radionuclide imaging:**

Using: Technetium 99,

Gallium 67,

 Or Indium 111.

**Blood tests:**

Hb, WBC, ESR, C-reactive

protein, Rheumatoid factor,

tissue typing (HLA antigens)

and biochemical tests.

**Synovial fluid analysis:**  synovial fluid aspiration and send for cell count biochemical study, culture and sensitivity.

**Bone biopsy:**either open or "closed".

**Arthroscopy:**

Introduce a tube and light to see the interior of the joint (diagnostic), or to do certain procedures (operative),commonly for knee and shoulder joints.

**Electro diagnosis:**

This test the nerve and muscle function by electrical method:

*Nerve conduction study*: measure the conduction velocity, by applying a stimulus to the skin over nerve and measure the response by needle electrode inserted into the muscle

e.g. a compressed nerve cause a delay in conduction.

*Electromyography (EMG)*: test the activity of a muscle at rest and during contraction; e. g. a denervated muscle has spontaneous abnormal activity at rest.

It can also differentiate between neuropathic and myopathic disorders; though, **nerve** and **muscle biopsy** may be necessary.