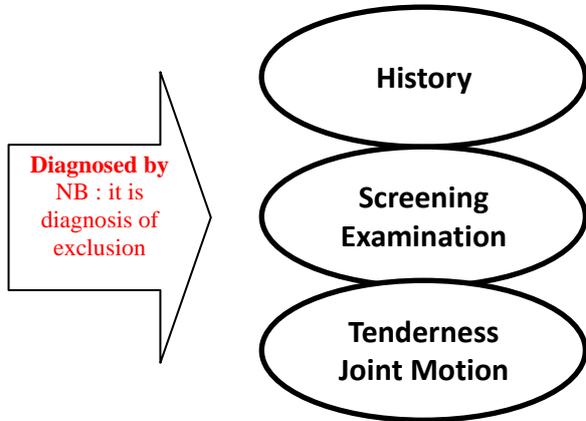


Common Pediatric Lower Limp Disorders

Alogayie'sl notes will be on the lec while The team's notes will be at page 145

❖ 1- Leg Aches:

- What is leg aches?
 - Growing pain (usually after playing)
 - Benign
 - No functional disability
 - Resolves spontaneously
 - Unknown cause
- Clinical features
 - *Diagnosis by exclusion*

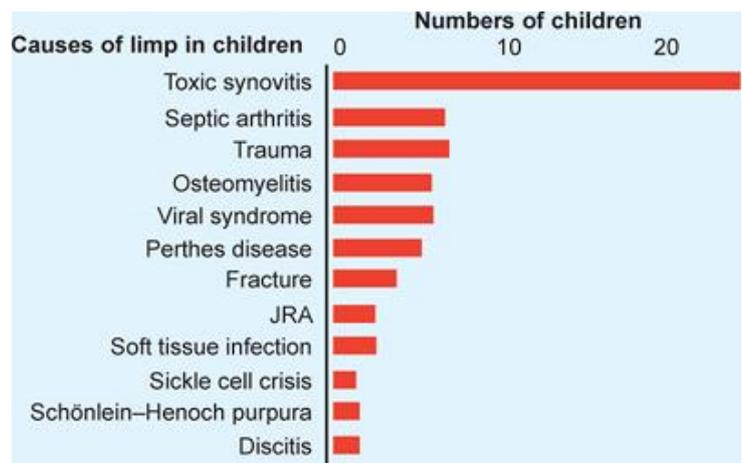


- Differential Diagnosis from serious problems mainly tumor
 - Osteoid osteoma
 - Osteosarcoma
 - Ewing sarcoma
 - Rheumatic fever
 - Septic arthritist
 - Trauma
- Management
 - Symptomatic
 - Reassuranc and follow up
 - No need for any active treatment

Feature	Growing Pain	Serious Problem
History		
Long duration	Often	Usually not
Pain localized	No	Often
Pain bilateral	Often	Unusual
Alters activity	No	Often
Causes limp	No	Sometimes
General health	Good	May be ill
Physical Examination		
Tenderness	No	May show
Guarding	No	May show
Reduced range of motion	No	May show
Laboratory		
CBC	Normal	± Abnormal
ESR	Normal	± Abnormal
CRP	Normal	± Abnormal

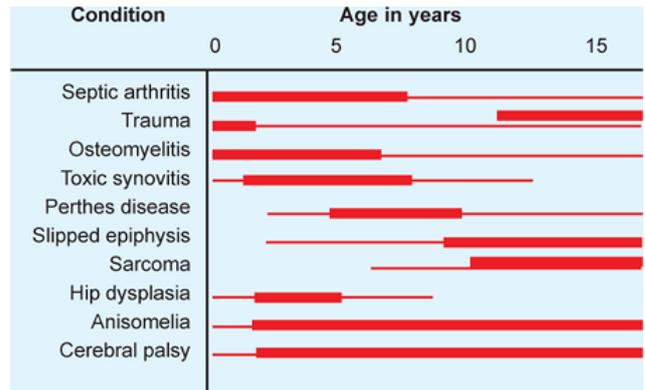
❖ 2- Limp: (symptom NOT Dz)

- Abnormal gait due to:
 - Pain → So show Antalgic gait
 - weakness
 - Deformity (ex , coxavara)
 - Others (like DDH – arthritis)
- It could be temporary like ((transit Synovitist)) which common in childrens and resolve in 2 to 3 days

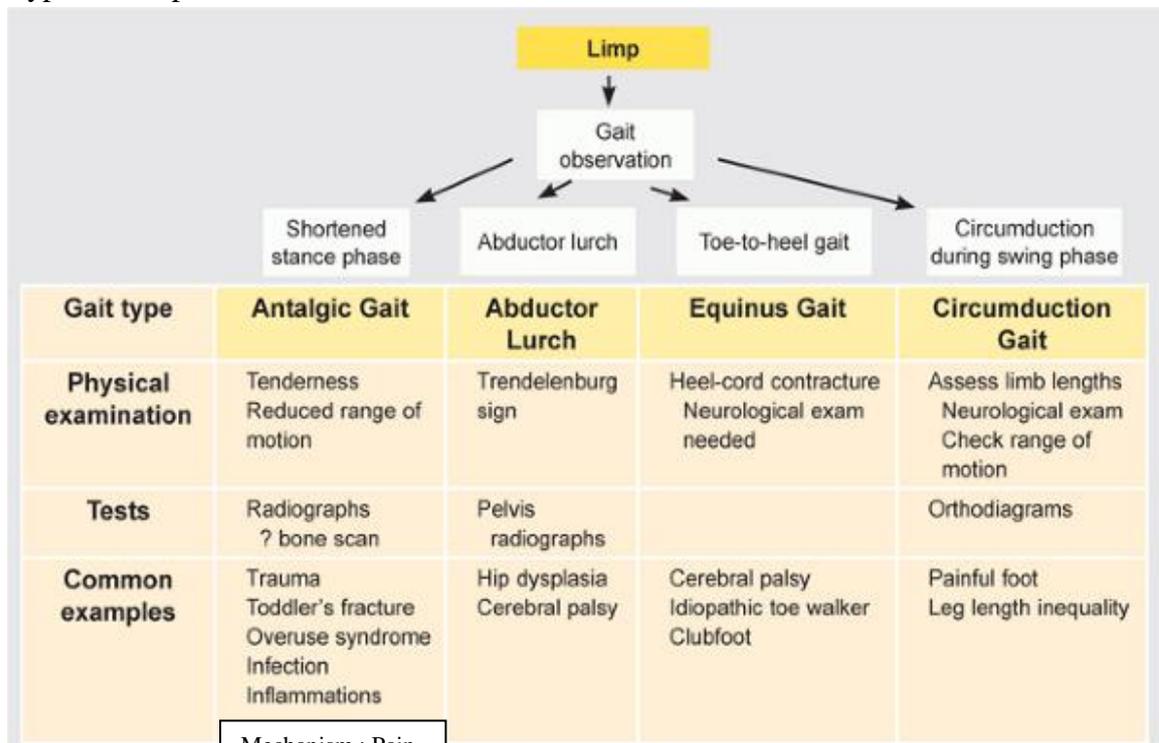


▪ **Limp Evaluation (Do wide screening and general examination)**

- History (Mainly age of onset)
- Observation
 - Evaluate the limp by studying the child's **gait** while the child walks in the clinic hallway (**SOHULD** be for long distance)



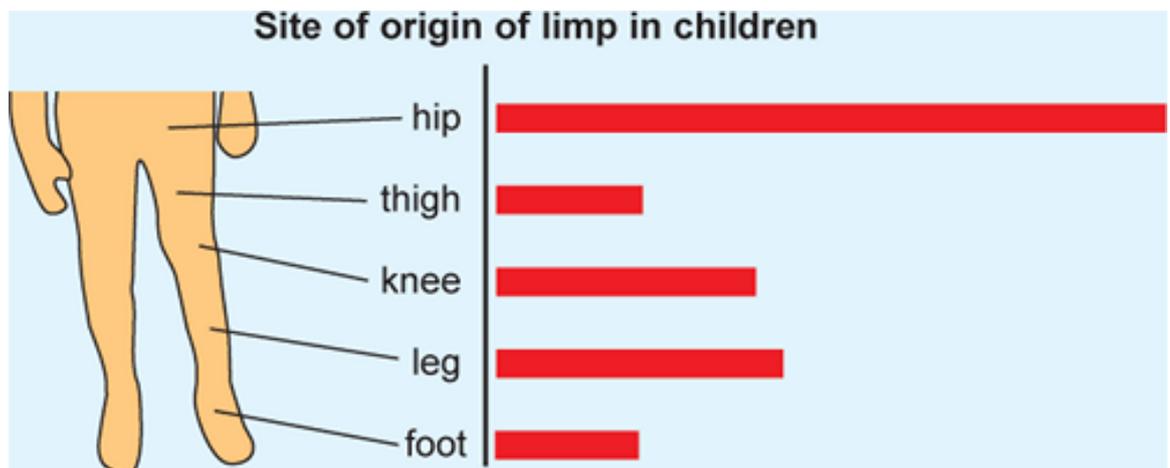
▪ **Types of limp:**



Mechanism : Pain induced

• **Management**

- Generalization regarding management cannot be made
- **Treatment of the cause** – MCQ - → Symptomatic treatment is not enough



▪ **3- In-toeing and Out-toeing: (Symptom NOT disease – And its name is not specific to the cause)**

▪ **Terminology**

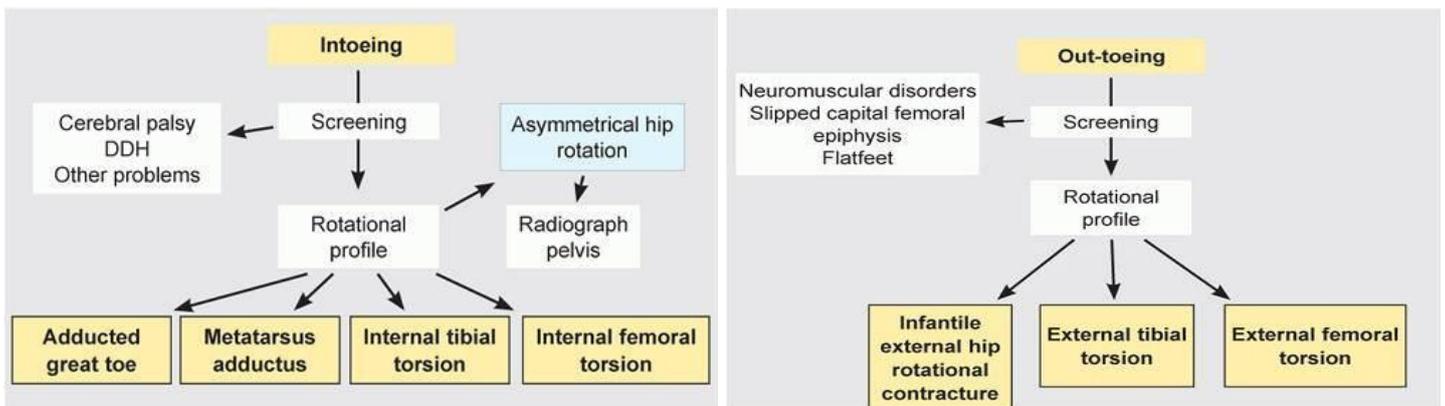
- Version
 - Describes normal variations of limb rotation
 - It may be exaggerated
- Torsion
 - Describes abnormal limb rotation
 - Internal or external
 - It may be complex if there is compensatory torsion

NB : Version used if something normally occurring exaggerated

▪ **Evaluation**

- History
- Screening examination
- Rotational profil

• **Causes :**



So the causes could be in the (Hip – femur - Tibia Or foot)

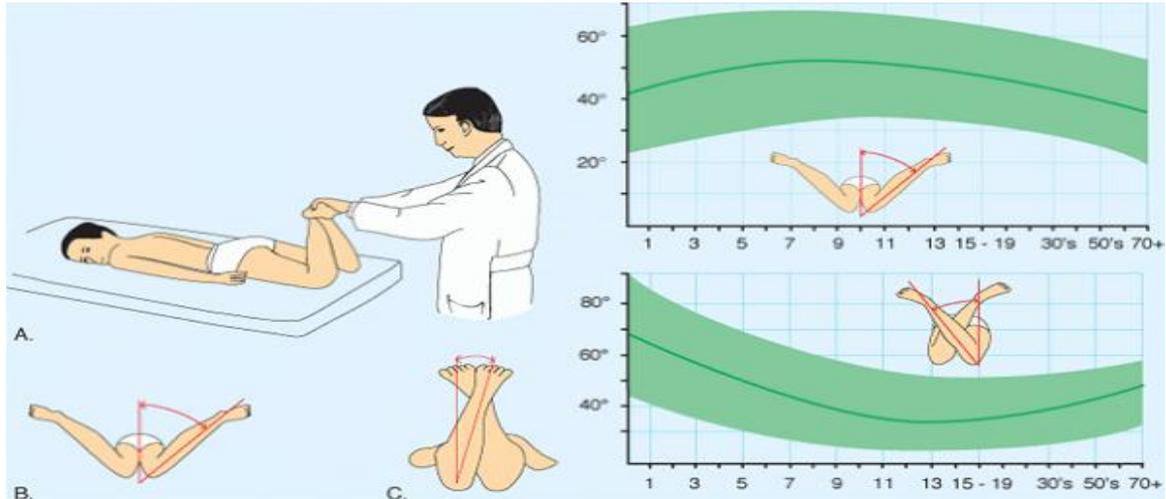
So we do

▪ **Special tests to determine the location of the abnormality :**

- 1- hip
 - Before assisting the rotation look at the child while he or she sitting : in case of hip abnormalities the child will sit in W position

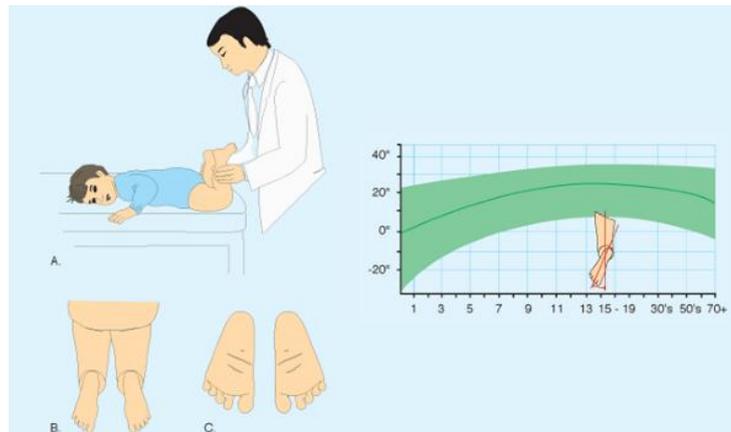


Then assist the rotation by this maneuver

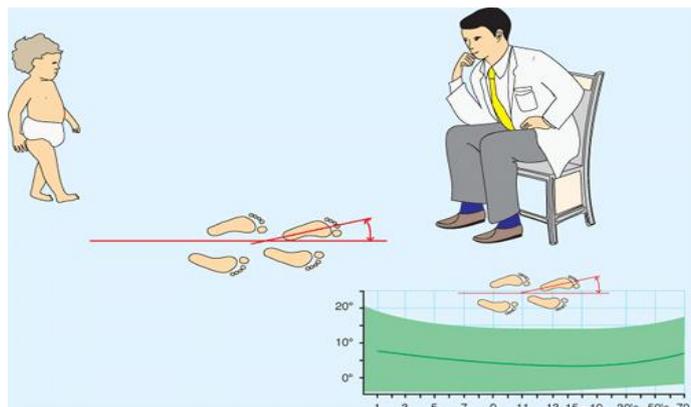


In here look for the Angle of motion → test the internal and external rotation
 NB : in Intoing the internal rotation will be limited while the external rotation will be wider than normal

- 2- Assessing rotational status of tibia and foot (look for the angle of motion and look at the internal and external tibia rotation)

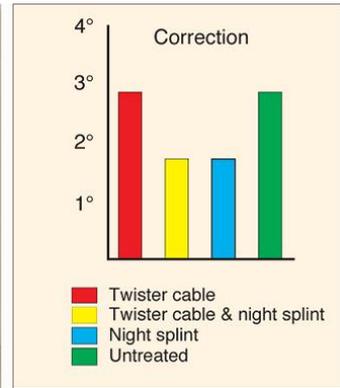


- 3- Foot progression angle: (Ask the baby to walk) → normally the angle is 10 to 15 externally
- This test can differentiate between intoing and the outtoing by looking if the angle is going in or out



▪ **Management principles**

- Establishing correct diagnosis
- Allow spontaneous correction (observational management) – **1st step – MCQ**
- Control child’s walking, sitting or sleeping is extremely difficult and frustrating
- **NON surgical :**
- Shoe wedges or inserts are ineffective
- Bracing with twister cables limits child’s activities
- Night splints have no long term benefit

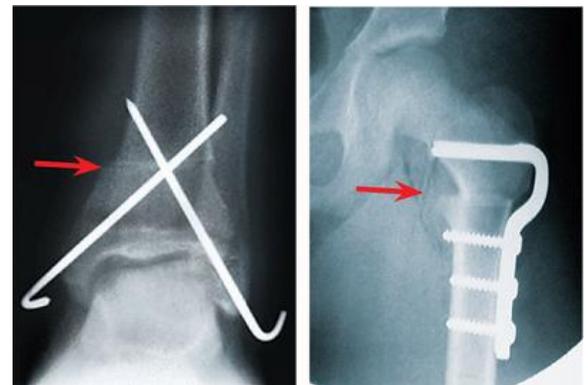


NB : all the non surgical methods are not effective so they are not used any more

2nd step : reevaluation

▪ **3rd step : Operative correction (start with this option if it sever)**

- Indicated for children above the age of 8 years with significant cosmetic and functional deformity



Surgical options :

If the deformity in the HIP : break below the neck (Subtrochanter) of the femur and rotate to the normal position and hold it by screws

Femur : break the lower shaft (metaphysic)

Tibia : break the lower methaphysis

❖ **4- Limb Length Inequality: (symptom not Dz)**

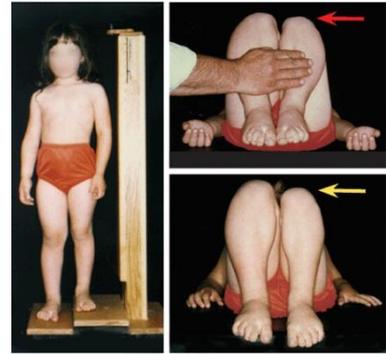
- True and apparent → it is IMP to **determine (1st step of diagnosis and management) _ MCQ**
- Etiology : 1- true :

Category	Short	Long
Congenital	Aplasia Hypoplasia Hip dysplasia Clubfoot	Hyperplasia
Neurogenic	Paralysis Disuse	Sympathectomy
Vascular	Ischemia Perthes disease	AV fistular
Infection	Physeal injury	Stimulation
Tumors	Physeal involvement	Vascular lesions
Trauma	Physeal injury Malunion	Fracture stimulation Distraction

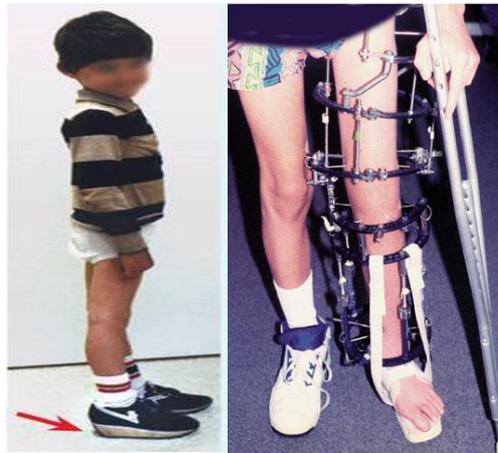
2- apparent: **caused by Galizi of the pelvic – MCQ -**

Group A1

- Adverse effects
 - Back pain
 - Scoliosis
 - Equinous (**dorsiflexion**) deformity
 - Distrusted gait
 - Limping
- Evaluation
 - Screening **examination** : to detect the cause and the **location (tibia or femur)** of the abnormality
 - Clinical measures of discrepancy الفرق
 - Imaging methods (Centigram)



- Management principles (of true type) → it is IMP to avoid the Adverse effects
 - Severity (if it < 2 cm no need for treatment → shoes are enough) MCQ
 - Lifts (shoes)
If it is 3cm (1 inch) or more the options are :
 - Shortening
 - Epiphysiodesis
 - Lengthening
- For apparent type : treat the cause – MCQ

❖ 5- Genu Varum and Genu Valgum: (symptom not dz)

- Definitions
 - Bow legs (**Genu Varum**)
 - Knock knees (**Genu Valgum**)

Group A1

Feature	Physiologic	Pathologic
Frequency	Common	Rare
Family history	Usually negative	May occur in family
Diet	Normal	May be abnormal
Health	Good	Other MS abnormalities
Onset	Second year for bowing Third year knock-knees	Out of normal sequence Often progressive
Effect of growth	Follows normal pattern	Variable
Height	Normal	Less than 5th percentile
Symmetry	Symmetrical	Symmetrical or asym
Severity	Mild to moderate	Often beyond ± 2 SD

▪ Evaluation

– Etiology could be :

1-physiological : In young babies it is normally to have Genuo Varuse and it usually disappear after the 2nd year of age → after 2 years it become Genou valguse up to the 4th year → after the 4th year it become straight and any diviation is consider pathological

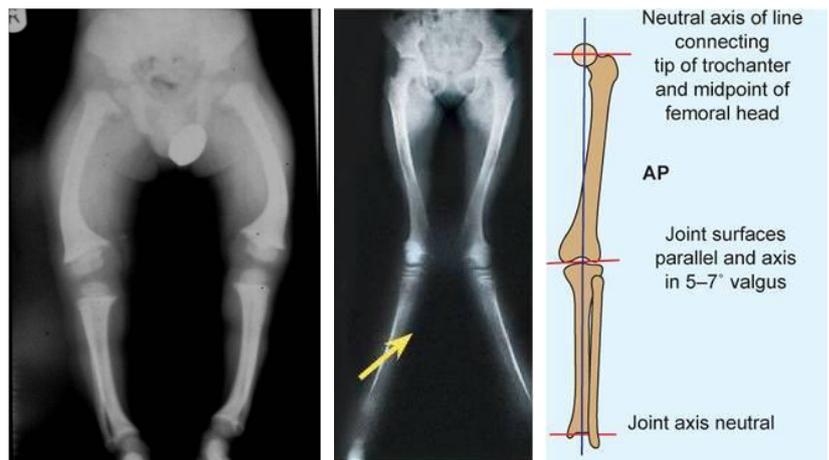
NB : DO NOT DIAGNOSE physiological UNLESS all the Pathological excucluded

2-pathological : Rickets is the MOST COMMON cause – MCQ

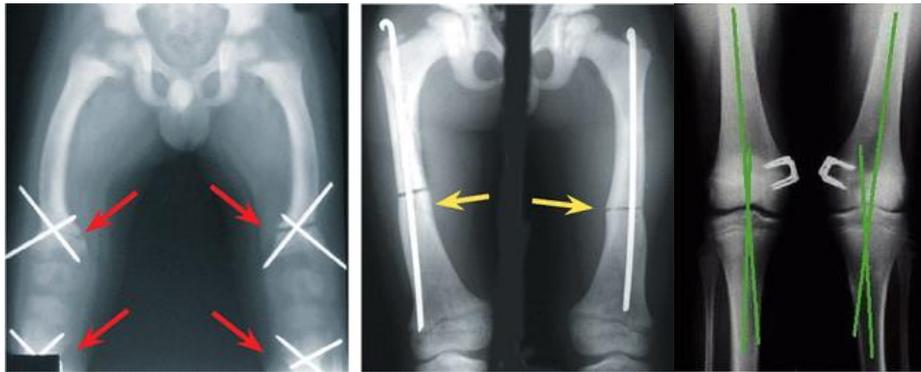
NB: Richets cause Excaguration of the physiological appearance (in young Varuse and in old Valgus)

Cause	Genu Valgum	Genu Varum
Congenital	Fibular hemimelia	Tibial hemimelia
Dysplasia	Osteochondrodysplasias	Osteochondro-dysplasias
Developmental	Knock-knee >2 SD	Bowing >2 SD Tibia vara
Trauma	Overgrowth Partial physeal arrest	Partial physeal arrest
Metabolic	Rickets	Rickets
Osteopenic	Osteogenesis imperfecta	
Infection	Growth plate injury	Growth plate injury
Arthritis	Rheumatoid arthritis knee	

- History
- Examination (signs of Rickets)
- Laboratory
- Imaging → measure the axis of the lower limbs → AS in the Pic (put line on the centers of the 3 joints → they should be straight other wise (if it Inside : it is Valgus and if it outside it is Varus)



- Management principles
 - Nonoperative? → If it physiological
 - Pathological :
 - 1st treat the cause (MCQ) then treat the deformity by :
 - Epiphysiodesis
 - Corrective osteotomies
- NB : Assist the ligament involvement (because this abnormality could affect the Medial and lateral ligaments) → So do Varuse and Valguse stress test to screen for abnormalities
- NB : he non operative treatment is not effective in pathological type



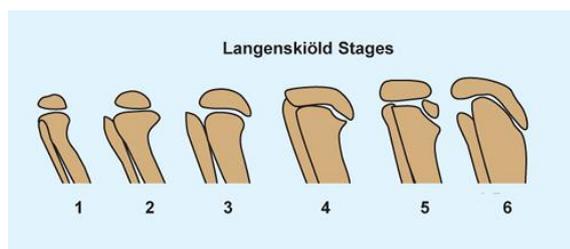
Side effects of the abnormality : **Osteoarthritis – MCQ -**

❖ **6- Tibia Vara: (idiopathic damage of the upper medial physis of the tibia – MCQ)**

- It called : Blount disease
 - Damage of proximal medial tibial growth plate of unknown cause
- Main evaluation method is MRI – MCQ



It devisd into 6 degrees :



Treatment : osetomy

❖ **7- Clubfoot: (common dz called : Talebus equinis varus)**

- Normal foot
 - **Stable:** for supporting the body weight in standing
 - **Resilient:** for walking and running
 - **Mobile:** to accommodate variations of surface
 - **Cosmetic**

- Etiology
 - Postural (bad position during pregnancy)
 - Idiopathic (CTEV)
 - Secondary → mainly Spina Befida – MCQ



- Diagnosis :
 - 1- Trial of correction (if it worked then it is Postural)
 - 2- If the correction fails (suspect secondary)
 - 3- Screen for the secondary causes :
- Clinical examination

Exclude

- Neurological lesion that can cause the deformity “Spina Bifida” → **ALWAYS DO X RAY OF THE SPINE _ MCQ**
 - Other abnormalities that can explain the deformity “Arthrogyposis, Myelodysplasia”
 - Presence of concomitant congenital anomalies
 “Proximal femoral focal deficiency”
 - Syndromatic clubfoot
 “Larsen’s syndrome, Amniotic band Syndrome”
- 4- if all Fails then it is Idiopathic

Characteristic Deformity: (name + location – MCQ)

Hind foot

- Equinus (Ankle joint)
- Varus (Subtalar joint)

Fore foot

- Forefoot Adduction
- Cavus (means : high foot arch) –

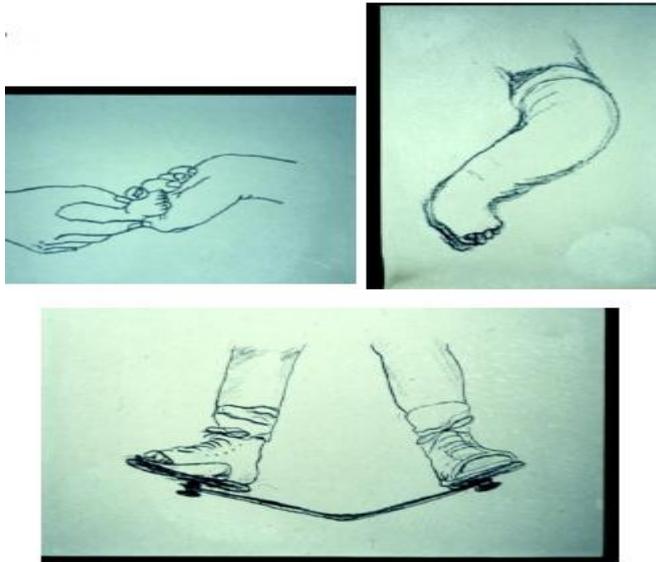
NB : (for your info : the opposite of Cavus is Plannus (low arch – flat foot)

secondary deformity :

- Short Achilles tendon
- High and small heel
- No creases behind Heel
- Abnormal crease in middle of the foot
- Foot is smaller in unilateral affection
- Callosities (persa) at abnormal pressure areas فقط في الاطفال اللي يمشون
- Internal torsion of the leg
- Calf muscles (gasteronamuse) wasting
- Deformities don’t prevent walking



- **Management of Idiopathic – الباقي غير مطلوب**
 - **The goal of treatment for clubfoot is to obtain a plantigrade foot that is functional, painless, and stable over time**
 - **A cosmetically pleasing appearance is also an important goal sought by the surgeon and the family**
 - Manipulation and serial casts
 - Validity, up to 12 months!
 - Technique “Ponseti” → way of manipulation
 - Avoid false correction
 - When to stop? → if there are false correction or not improvement by Penn's brown
 - Maintaining the correction
 - Follow up to watch and avoid recurrence



- Indications of surgical treatment
 - Late presentation, after 12 months of age!
 - Complementary to conservative treatment
 - Failure of conservative treatment
 - Residual deformities after conservative treatment
 - Recurrence after conservative treatment
- Types of surgery
 - Soft tissue → release (for young ages < 2 Y) → it also should be done in all other types → Methods call : Z lengthening of the Tendon Achilles
 - Bony (> 2 Y)
 - Salvage (> 12 Y) → it improve the pain but not the movement

❖ 8- Lower Limb Deformities in CP (cerebral palsy) Child:

Physiological classification

- Spastic → the most common type that need surgery –

MCQ

- Athetosis
- Ataxia
- Rigidity
- Mixed

Topographic classification

- Monoplegia
- Paraplegia
- Hemiplegia
- Triplegia
- Quadriplegia or tetraplegia
- Bilateral hemiplegia → 4 limbs : the upper limbs are affected more than the lower
- Diplegia → All 4 but Lower affected more than the upper

Presentation : MCQ

- Hip
 - Flexion (Do tomas's test)
 - Adduction (Do range of motion)
 - Internal rotation (Do range of motion)
- Knee
 - Flexion (Do range of motion → it will show massive popliteal angle in full extended position with hip at 90 degree
- Ankle → Do pedoScope – MCQ
 - Equinous (planter flexion)
 - Varus or valgus
- Gait ; MCQ
 - Intoeing (caused by internal rotation)
 - Scissoring (caused by adduction)
- Management principles
 - Multidisciplinary
- Options of Surgery
 - Neurectomy
 - Tenotomy
 - Tenoplasty
 - Muscle lengthening
 - Tendon Transfer
 - Bony surgery Osteotomy/Fusion – MCQ



Common Pediatric Lower Limb disorder lecture Note

Notes:

- Terminology is Important
- Femoral antiversion is normal in the Femur bone only
- Torsion is abnormal at the Tibial Bone
- In-Toeing is more common than Out Toeing

- Metatarsus adduction may called: forefeet adduction

Special Test:

◆ Assessing hip Rotation:

- Prone Position better so, the Femur will be supported
- If Internal rotation = Rotation --> NORMAL
- If Internal rotation More than Rotation --> In-Toeing
- If Internal rotation less than Rotation --> Out-Toeing

- W-sitting position: Internal rotation --> Lead to In-Toeing (Prevent the child from sitting like this)
If the Patient is walking, In-Toeing, Patella Facing Forward --> Means Tibial Problem

◆ Thigh-foot Axis

◆ Foot-Progression angle:

- Number 7 is the normal position
- Number 11 is beginning of In-Toeing
- Number 8 is sever Rotation

Note that:

In-Toeing could be Hemilateral

Tibial Correction is done by surgery

• **Limb Length InEquality: (LLI) or discrepancy:**

HemiHypertrophy --> the only condition that is long, Mostly is shortening

• **Genu Varum, Genu Valgum**

Since the baby is born, Normal position is Varus (0-2 years)

From(2-4 years) is Valgus

Then when the max Valgus is reached, the normal Return (there is a little Valgus Remaining)

• **Tibial Vara:**

From Hip --> Knee is normal

Blount Disease: only happen to patient who walk

• Club Foot:

Etiology

- May be Neurological Disease: lead to strong muscle in one side and weak in the other side
- If it is stretchable then it is a Postural Disease
- Idiopathic: there is no neurological Defect

There is Supination in the Fore-Foot

- Cerebral Pulsy:

◆ Brain Insult During Two First years of life

◆ Types:

- Physiological
- Topographic
- Distress during Delivery, Uterine Contaction (HR Decreased lead to CP+ breech Position) must do C-section

Depending on the site affected in the brain.

• Most common orthopedics problems associated with CP:

1. Hip: will be flexed, tight adductors + internal Rotation
2. Knee: will be flexed (tight Hamstring)
3. ankle: equionous (tight tendon achlies)

Examine all Then rehabilitation

Done !