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بسم الله الرحمن الرحيم



Neurophysiology I Module

Physiology Lab



Neurological Examination

B-Motor Examination

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in this note we will take about motor examination which include examination of :

- 1.muscles
 - 2.reflexes
 3. coordination of movement "cerebellum assessment"
- we will take about each in details so let's start.

1.Muscles

we examine the:

A. Bulk → see the size of muscle if normal ,atrophic or hypertrophic either by inspection or palpation in some muscles that have circumference we may use measuring tape .

1. atrophy

we have to note that there are 2 types of atrophy which related to LMNL and UMNL the muscles of LMNL become atrophic faster than the muscles of UMNL because in UMNL the muscle still response to reflexes by contraction so its hypertrophy takes time

2. hypertrophy

if the muscle is hypertrophic so it is either physiological as in muscle building or pathological as in such diseases that related to accumulation of certain substance in the muscle

B. Tone : is the static form of stretch reflex

ask the pt to move his joint passively

we measure if the pt able to resist against his force

if he resist more than normal so → hypertonic

if he resist less than normal so → hypotonic

Testing Muscle Tone



C. power

test of muscle tone , ask the pt to move the joint passively

we measure the ability to resist against the Dr force

ex: if the pt makes flexion of elbow then the Dr makes extension of the elbow

التيسر هون بطلب منو يثني ذراعو وانا بمد بالذراع ف لازم يقاوم قوة المد من الدكتور واخرتها تنكسر

Motor Examination

- 1-Bulk ,tone and power of the muscle**
- 2-Examination of superficial and deep reflexes**
- 3-Coordination of movement**
- 4-Gait**
- 5-Involuntry movement**

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1-Bulk ,tone and power of the muscle

- **a-Bulk of muscle:**

Inspect, palpate the muscle ,by measuring tape
compare both biceps

- **Results:**

Normal

Muscle atrophy

Muscle hypertrophy

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- **b-Tone of muscle:**
- **Def./**muscle tone is a state of partial incomplete continuous subtetanic contractions found in healthy muscle
- **Examined by** passive movement of the joints and noting the resistance it offers
- **Results:**
- Normal
- Hypertonia
- Hypotonia

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- **b-Power of muscle:**
- Tested against resistance

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الجدول للقراءة

| Movement | Segmental Innervation |
|--------------------------|-----------------------|
| Abduction of shoulder | C5 |
| Flexion of elbow | C5-C6 |
| Extension of elbow | C7 |
| Grasp the fist | C8 |
| Abduction of the fingers | C8-T1 |
| Hip flexion | L2 |
| Knee extension | L3-L4 |
| Ankle dorsiflexion | L4-L5 |
| Ankle planter flexion | S1 |

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هون الدكتور صارت تحكي عن الاوسكي وانه خطوات التشخيص بتكون اول شي
 history ___ examination ___ investigation

وانه لازم تبلىش فيهم بالترتيب حتى يساعدك تستثني امراض وما تغلب
 المريض بفحوصات ما الها داعي لانه ممكن مادياتو مش مناح وكمان رح ترهق العاملين في المختبر
 هلا رح نحكي عن اهم موضوع هو

Reflexes

we have 2 types of reflexes according to site of receptor : **superficial and deep reflex**
 let's start with Superficial reflexes which include :
 corneal , palatal , abdominal , planter and Babinski reflex

1. Superficial reflexes

A. corneal reflex :

we talked about it in PNS

procedure : touch the cornea by cotton this sensation is carried by trigeminal nerve

Response : bilateral closure of the eye this reflex is carried by facial nerve on each side.



b. palatal reflex :

procedure: depress the tongue by tongue depressor and try to touch the palate carried by 9th cranial nerve

response : palatal contraction by vagus



C. abdominal reflex :

abdominal area divided into 3 areas : upper , middle and lower

procedure: touch the abdominal area by cotton from outside to inside

reflex : contraction towarded the stimulus and below it

eg: if the stimulation in Rt. side then the muscle contract towarded Rt. side

if the response abnormal then we expect there is lesion at the **level T7-T12**



d. planter and Babinski reflex "imp"

procedure : stimulation of lateral edge of the sole foot to the base of big toe

normal response : flexion of all toes towarded the sole this is called -ve Babinski sign this response is a **modified response** due to development of pyramidal system since it is different in the children below 1 year

in abnormal response "+ve Babinski sign" we see :

1. dorsal flexion of big toe
2. fanning of other toes

-ve Babinski sign means normal reflex but +ve Babinski sign doesn't always mean abnormal reflex

cases of normal +ve Babinski sign "imp"

1. UMNL
2. children below 1 year
3. deep sleep
4. deep anesthesia



2. Deep reflexes → tendon jerk reflexes

نركز هون لانه الموضوع مهم ^_^

tendon jerk reflexes is the dynamic form of stretch reflex this performed by applying sudden stretch on the tendon which activate the dynamic stretch reflex

كل عضلة رح نعملها هاد التيبست لازم تكون بوضع معين بزواوية معينة بحيث تكون عاملة سترتتش خفيف ومهم ما تكون مغطية لحتى اشوف استجابتها و انقباضها "الزواوية لكل تيبست مهم جدا تحفظوهم"

it is imp to ask the pt to do voluntary contraction .but how ?!

if you want to examine the tendon jerk in upper limb so ask him to claps both hands

يشبك ايديه ببعض

if you want to examine the tendon jerk in lower limb so ask him to clench fist or grind his teeth

يشد على اسناتو

we called this "jendrassik maneuver" مهم

a. knee reflex

position : 90 degree

center : L3_L4

result : extension of the leg and contraction of quadriceps muscle

the most imp in the test is the contraction of the muscle not the extension of leg

**** in chorea and neocerebellar syndrome the pt has hypotonia and hyporeflexia**

so the leg move like pendulum " pendular neojerk "



b. Ankle jerk

Position : slight flexion

center : S1_S2



C. Biceps jerk

position : 120 degree

center : C5_C6

we can't catches biceps tendon so but your thumb over the tendon and tap by the hammer over the thumb



d. triceps jerk

position : 90 degree

center : C6_C7

tap the tendon directly

| Tendon | Angle "imp" | Muscle | Center "imp" | Response |
|---------|----------------|------------|--------------|---------------------------|
| knee | 90 | quadriceps | L3_L4 | quadriceps Contraction |
| ankle | Slight flexion | | S1_S2 | Sole Extension |
| biceps | 120 | biceps | C5_C6 | Biceps contraction |
| triceps | 90 | triceps | C6_C7 | Triceps contraction |

3. coordination of movement "cerebellum assessment"

A. Dysmetria examination

of upper limb

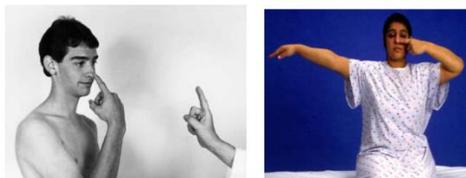
1. finger__ nose

ask the pt to touch his nose

2. finger _ finger

ask the pt to touch your finger

- a)Finger to nose test



of lower limb :

1. heel _ knee test

pass his heel along tibia shaft

If he has a problem he can't pass directly

b) Heel-Knee test



B. Neocerebellar syndrom "Motor ataxia "

by inspection you note that:

Zigzag gait " Drunken gait "

Nystagmus " rapid eye movement "

staccato speech

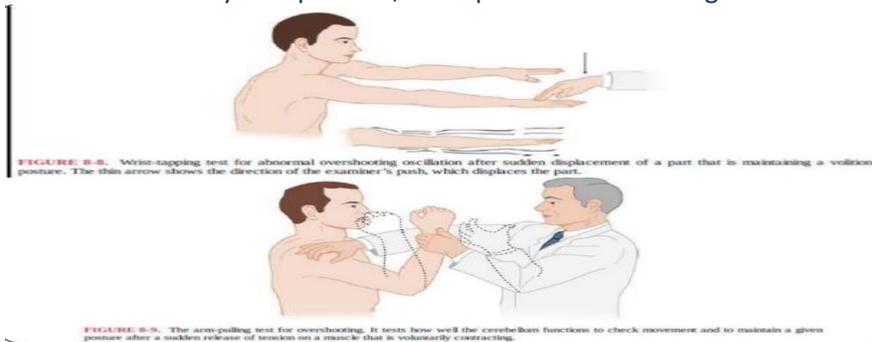
C. examination of breaking effect

هاد التيسر موجود بالاسلايدات بس الدكتور ذكرتو وشرحتو

Arm pulling test :

ask the pt to put his arm in front of his face then the Dr abduce the pt arm ,then the Dr pull out his arm suddenly . if the pt arm hits his face so there is a problem , normally he can stop his arm .

note that the safety is important , if the pt wear a watch or glasses then remove them



D. Romberg

diagnosis of sensory ataxia

here the defect is in the dorsal column

normal speech

no Nysagmus

high steppage gait

برفع رجلي عالي لما يمشي حتى يشوف رجلي وهي بتوصل الارض لانه ما يكون حاس بالارض تحتو

spastic gait

بصير يمشي ويخبط رجلي بالارض حتى يسمع صوت رجلي وهي بتخبط بالارض

If he closes his eye he loses his parlance

لازم تنتبه لامن المكان حتى ما يوقع المريض ويادي نفسه

3. Romberg:

Stand upright, place feet together, then close eyes

- loss of balance means + Romberg test

Be prepared to protect patient from falling!



4. Gait

مهم حفظ كل طريقة المشي لكل مرض

neocerebellar , motor ataxia -> Zigzag " Drunken " gait

sensory ataxia -> spastic ' high steppage "gait

Parkinson-> shuffling " small steps "gait

+ monotone speech

Pelvic gird in children -> Waddling gait

5. Involuntary movement

it is important to note the abnormal movement while you talk to pt

as in

Chorea " dance like movement " which denote a defect in basal ganglia

Tremor -> during rest as in Parkinson

-> during movement as in chorea

-> tension tremor

Good luck

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