

Hands up! - date

ENMG, Grundlagen, Wissenswertes



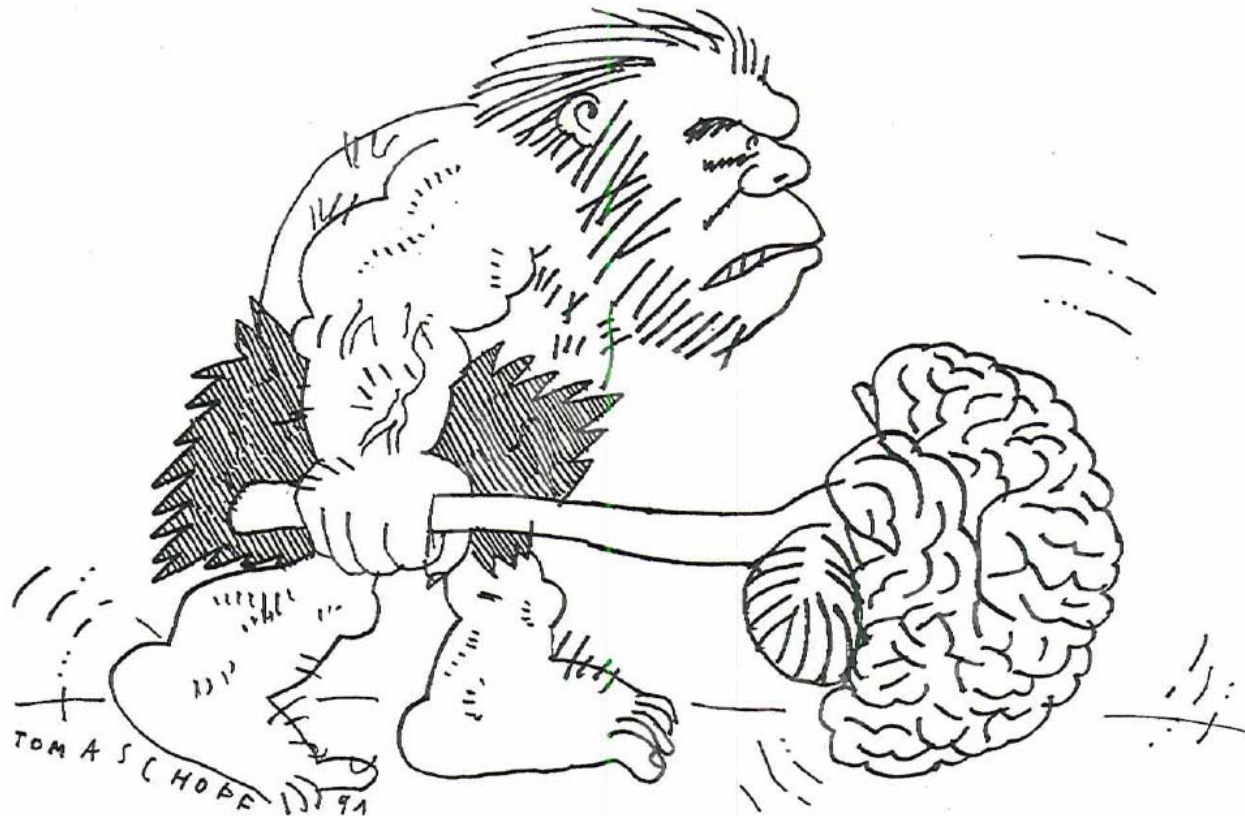
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uniklinik
balgrist

ENMG: verlängerter Arm des Neurologen



Läsionsort peripheres NS

- Spinal / Vorderhorn
- Nervenwurzel
- Plexus
- Peripherer Nerv
- (Neuromuskuläre Endplatte)
- (Muskulatur)

Wo?

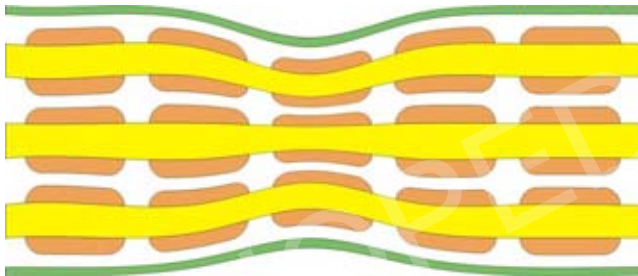


Läsionsart peripheres NS

- Mechanisch: Engpasssyndrome
- Immunologisch (Vaskulitis)
- Erregerbedingt (Wodurch? (Lepra, Borrelien, HIV))
- Toxisch (Vit. B12 Mangel, Alkohol)
- Vaskulär (Diabetes)
- Trauma
- Genetisch



Schweregrad Nervenläsionen



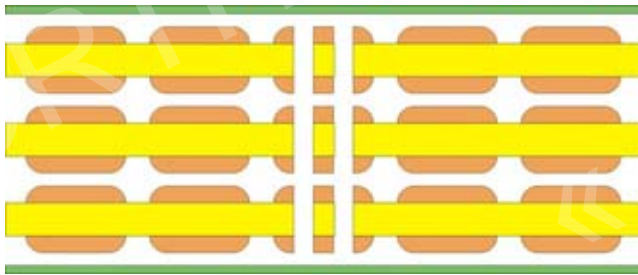
Neurapraxie

Druckschädigung / Zerrung

Nervenstrukturen erhalten

Restitution Stunden bis Wochen

konservative Therapie



Axonotmesis

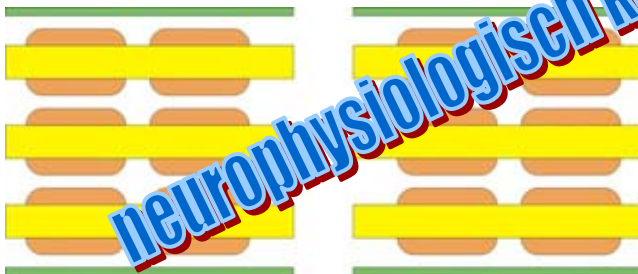
Trauma / Zug

Axone durchtrennt, Endoneurium erhalten

Distale Waller'sche Degeneration

Restitution Wochen bis Monate

konservative Therapie



Neurotmesis

Direktes Trauma, z.B. Biss, Schnitt

Nerv komplett durchtrennt

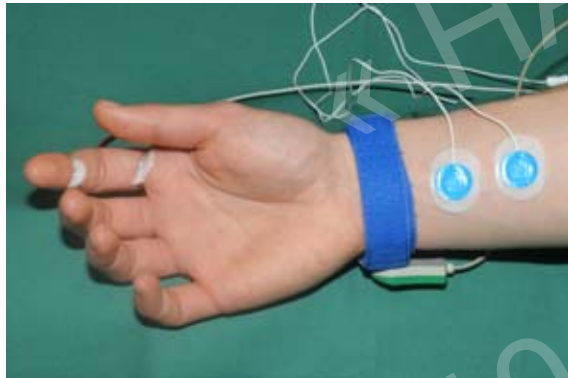
meist keine Restitution

operative Therapie (Nervennaht, Interponat)

neurophysiologisch keine Unterscheidung möglich!



Neurographie



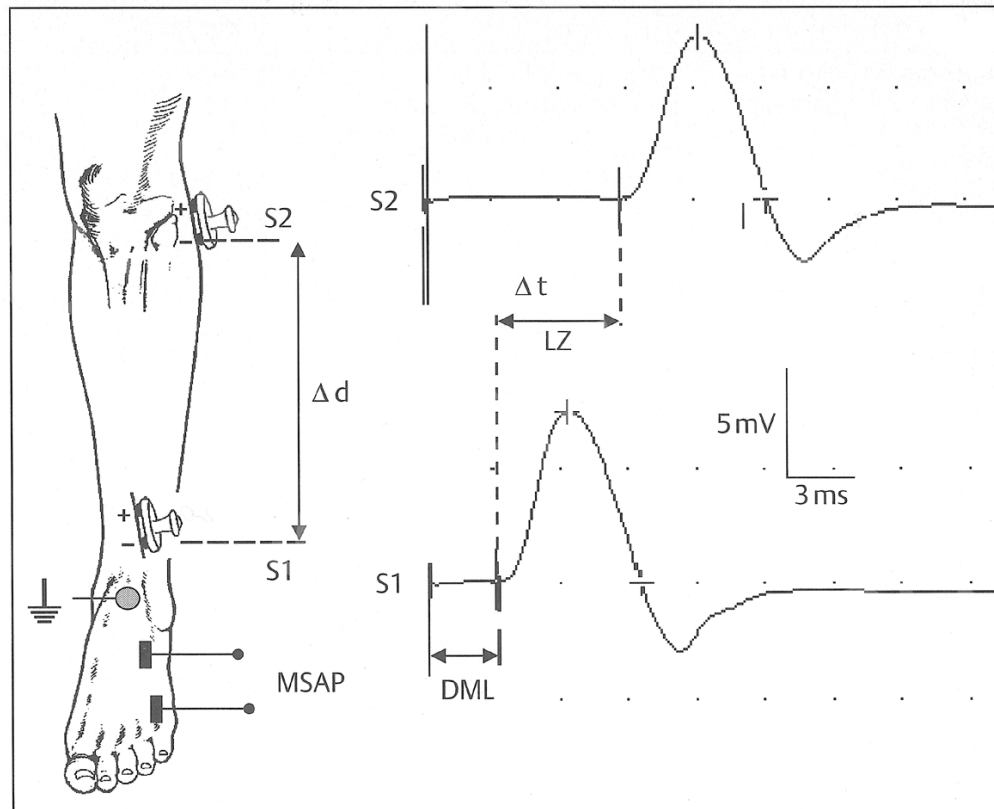
motorische Neurographie

Wichtige Begriffe:

- dmL (distal motorische Latenz)
- M_sAP (Muskel_{summen}aktionspotential)
- mNLG (mot.Nervenleitgeschwindigkeit)



motorische Neurographie



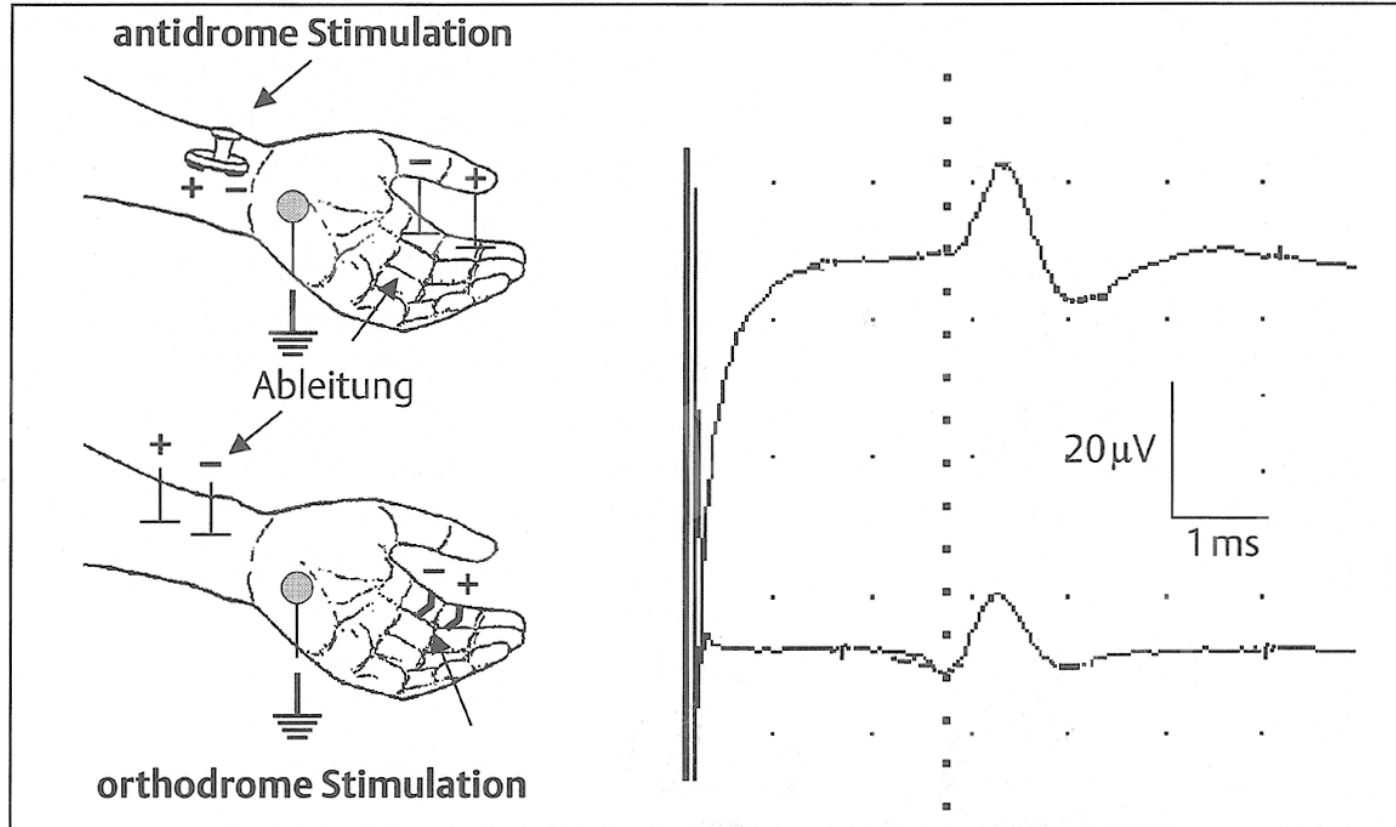
sensible Neurographie

Wichtige Begriffe:

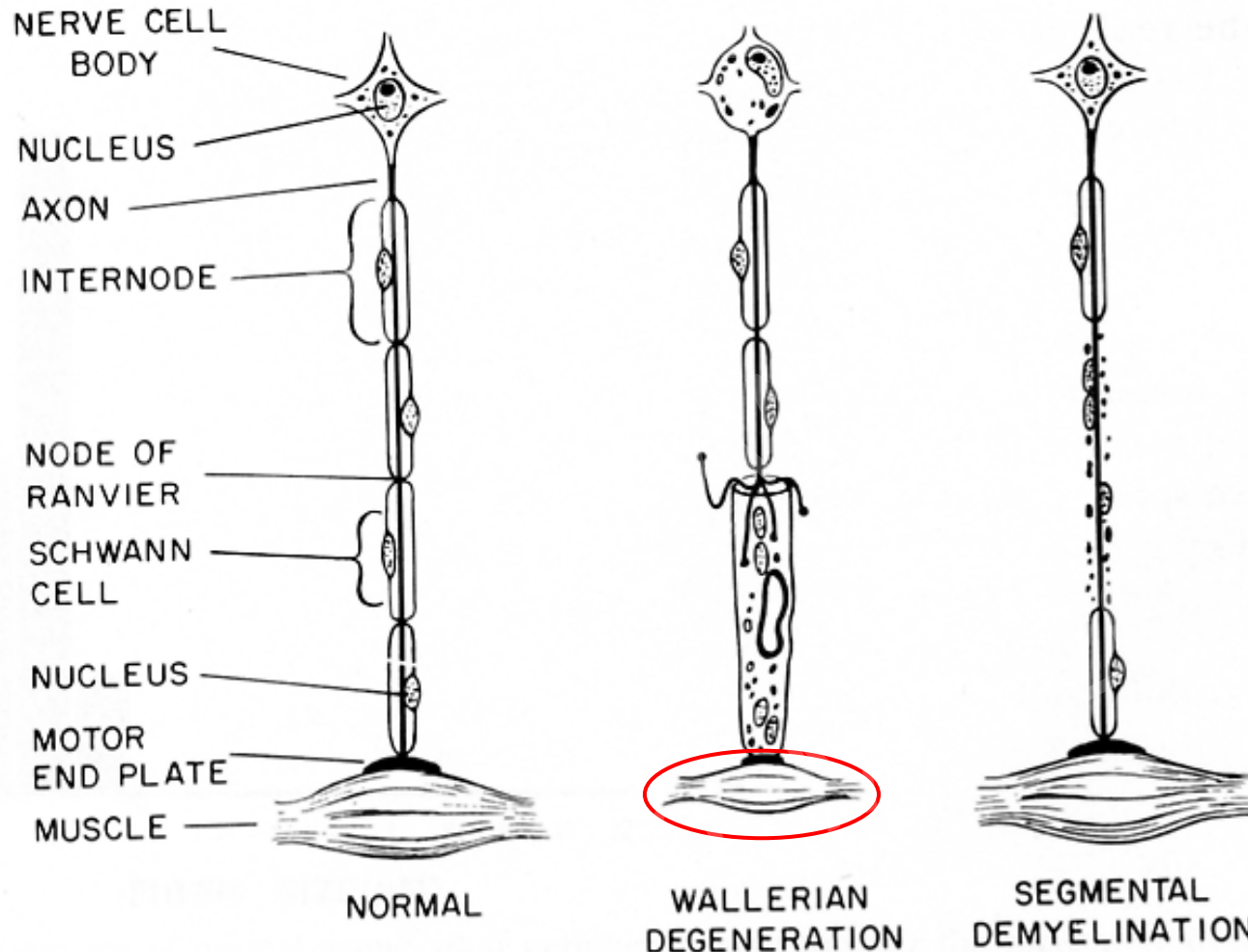
- sNAP (sensibles Nervenaktionspotential)
- sNLG (sensible Nervenleitgeschwindigkeit)



sensible Neurographie

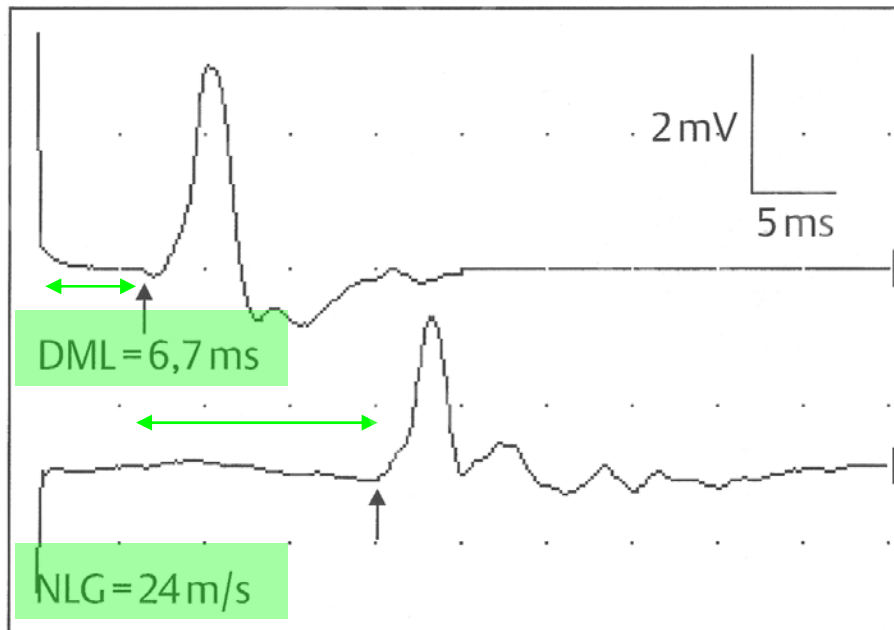


Pathomechanismen peripheres NS



demyelinisierende Neuropathie

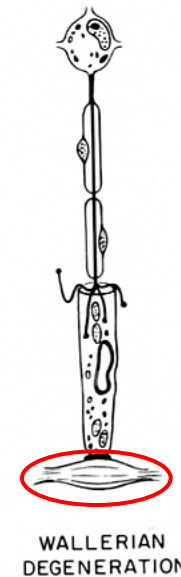
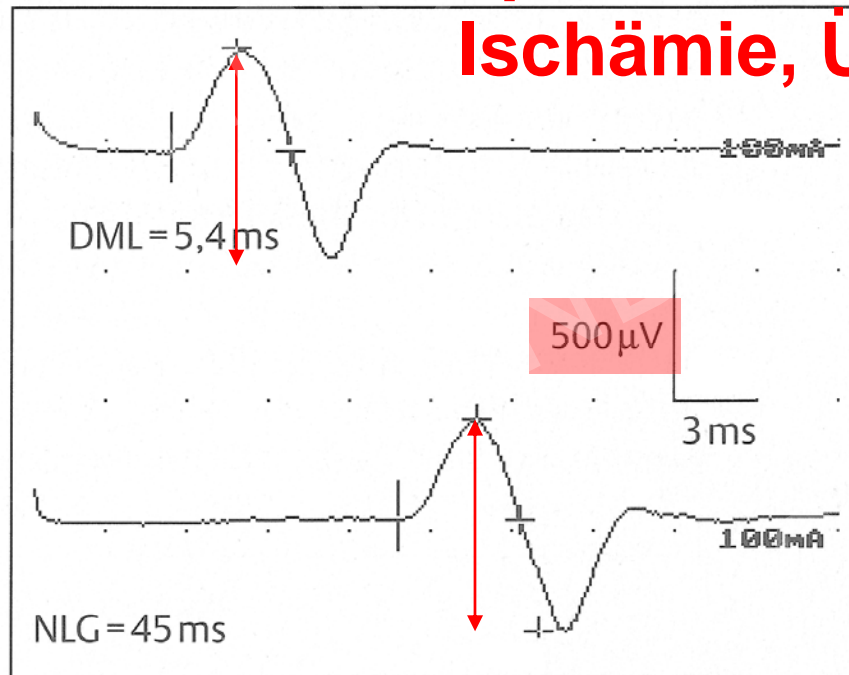
frühe Druckläsion / Engpass



- Lange **distal motorische Latenzen**
- Verlangsamte **Nervenleitgeschwindigkeiten**
- Tendenziell normale MAPs und SNAPs

axonale Neuropathie

spät bei Druckläsion,
Ischämie, Überdehnung



- Kleine MAPs und sNAPs
- Tendenziell normale NLGs

Grenzwerte Neurographie

motorisch:

dmL: < **4.2ms** (N.medianus), **3.4ms** (N.ulnaris)

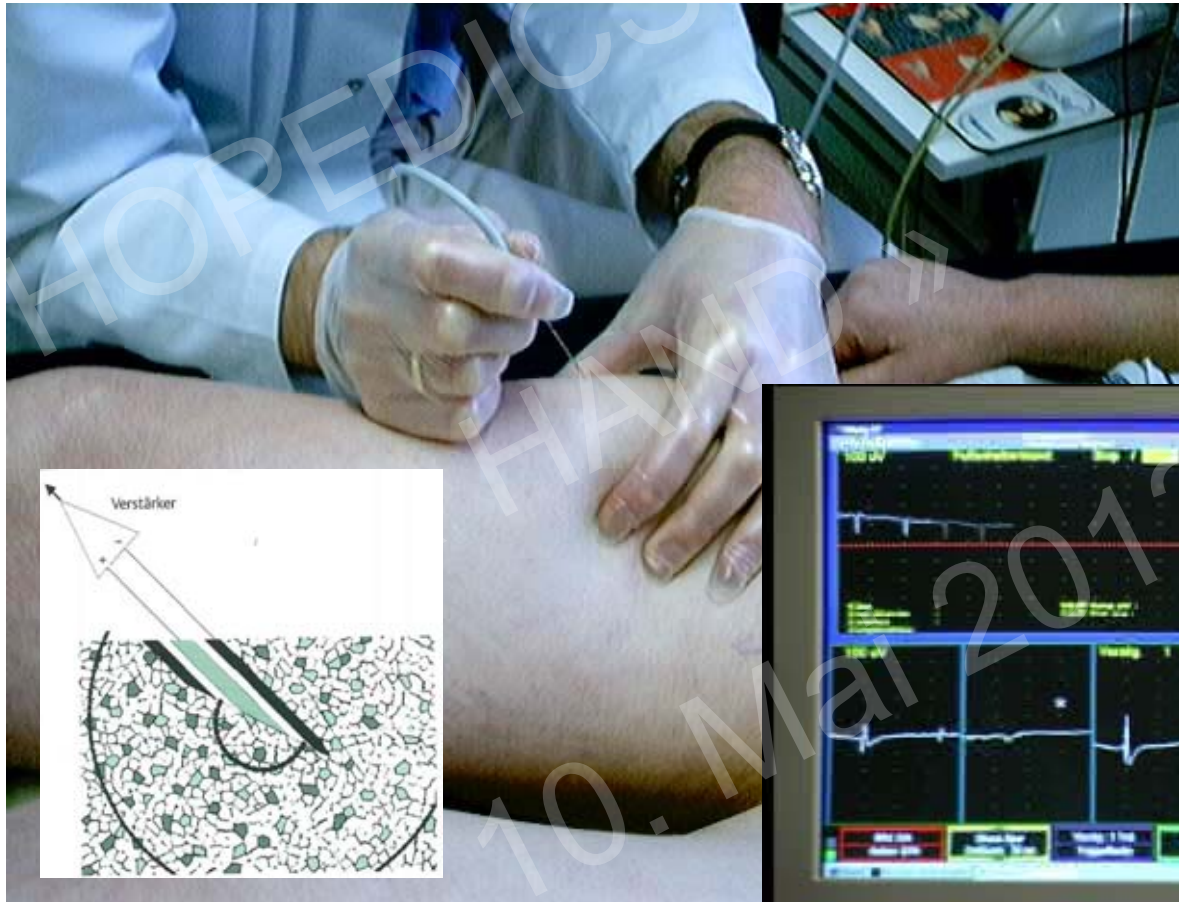
mNLG: > **48m/s** (obere Extr.)

sensibel:

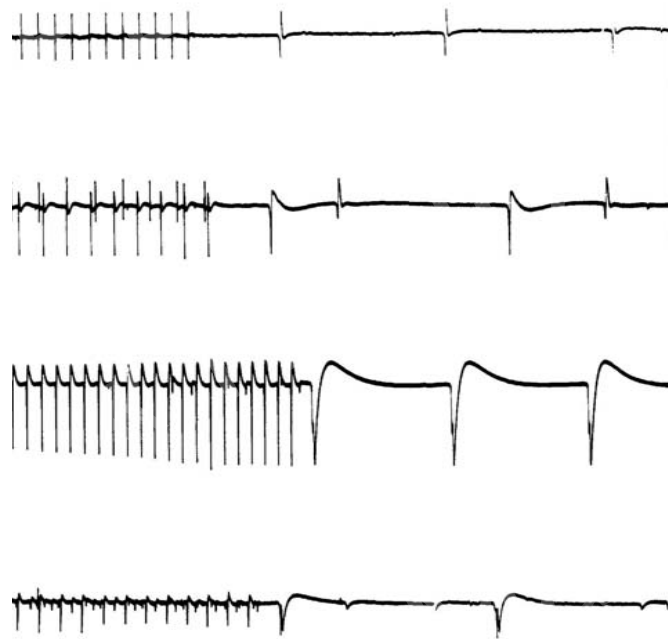
sNLG: > **44m/s** (obere Extr.)



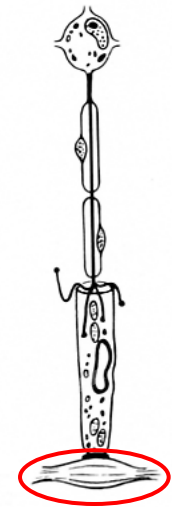
Elektromyogramm (EMG)



EMG: pathologische Spontanakt.



20 ms
200 ms | 0.2 mV



WALLERIAN
DEGENERATION



Neurographie CTS Diagnostik



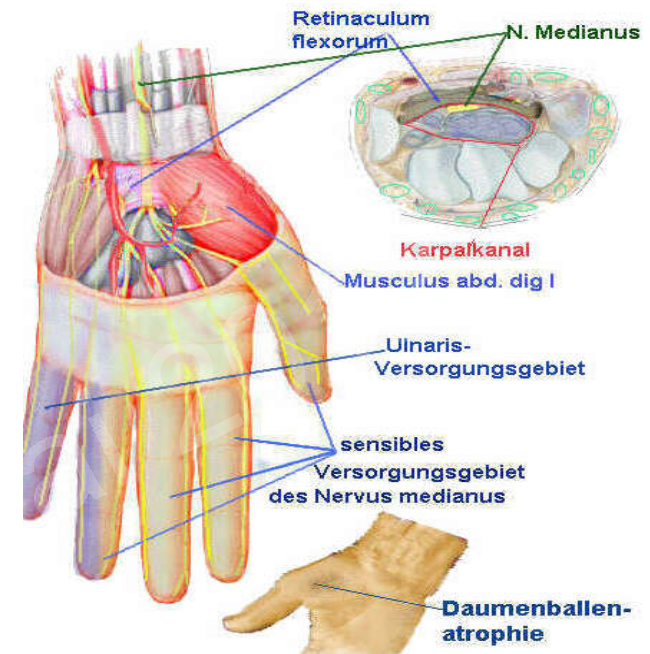


N.medianus: CTS

klinisch: Atrophie, Sens. Störg.
Schmerz: brachialgia nocturna

Typischer ENMG Befund:

1. sNLG med < uln (5m/s)
2. dmL > 4.2ms (6ms: OP)
3. MsAP med << uln
4. SA EMG APB



N. ulnaris (SUS)

Typischer ENMG Befund:

1. MsAP uln ↓ 50% (SU)

MOTOR NERVEN

2. mNLG ↓ 10m/s (SU)

3. sNAP ↓ Vgl. contralat.

Rechts Ulnaris pSA EMG ADM, ID1

Wrist - ADM

Bel Elb - ADM

Ab Elb - ADM

Plexus - ADM

Stim

62,1 m/s

35,0 m/s

47,9 m/s



N. ULNARIS

EPICONDYLUS
MEDIALIS

APONEUROSE

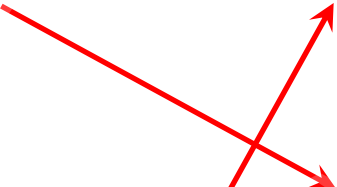

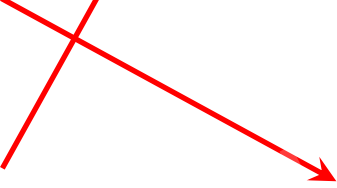

LIGAMENTUM
COLLATERALE
ULNARE

FLEXOR CARPI ULNARIS

OLECRANON

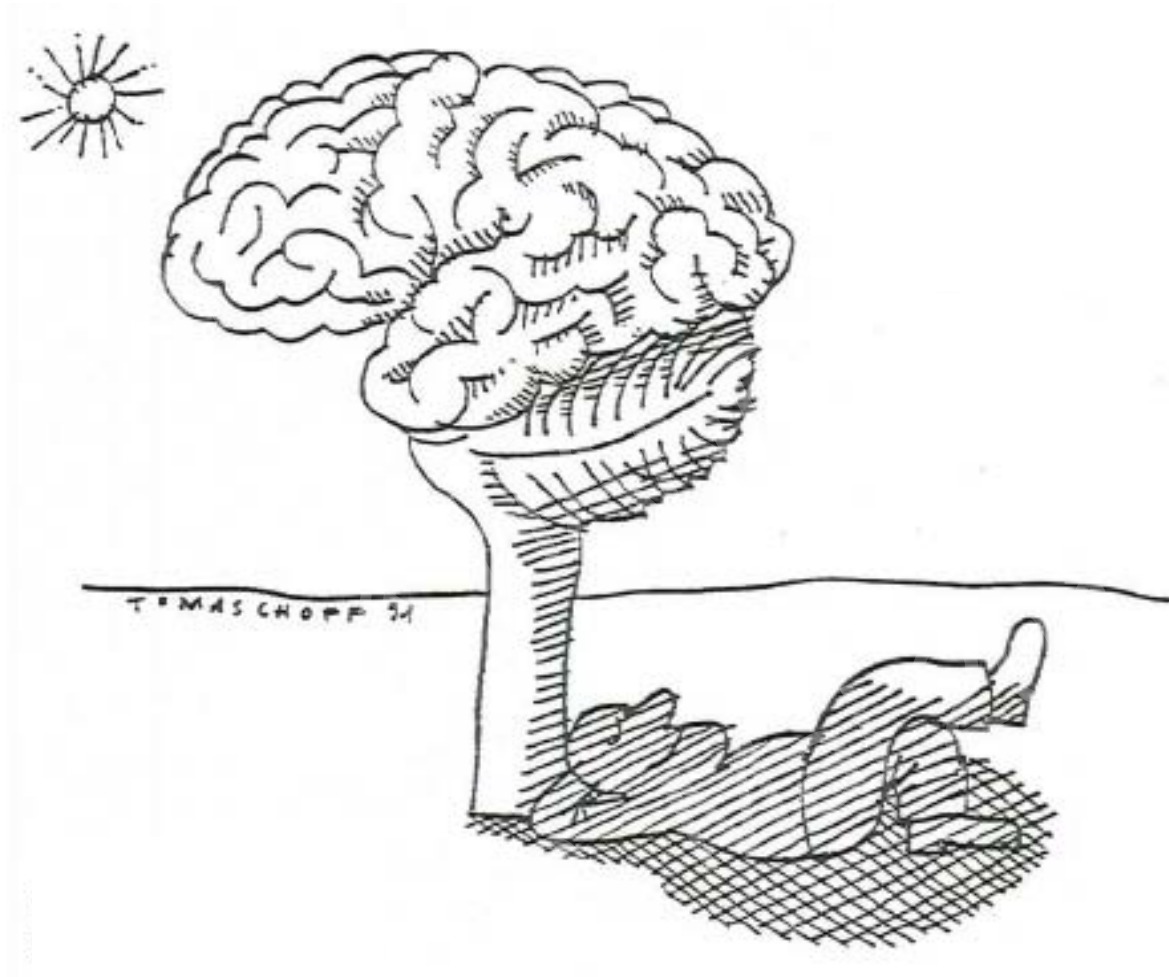


Takehome:

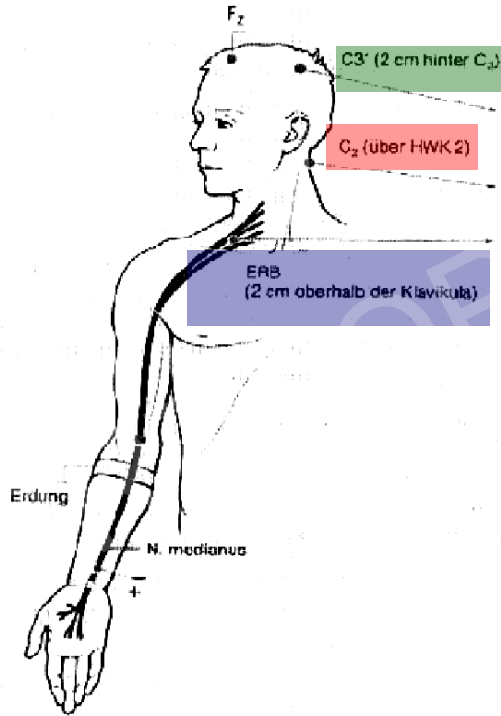
dmL N. medianus		> 44m/s
dmL N. ulnaris		< 4.2ms
mNLG obere Extr.		< 3.4ms
sNLG obere Extr.		> 48m/s



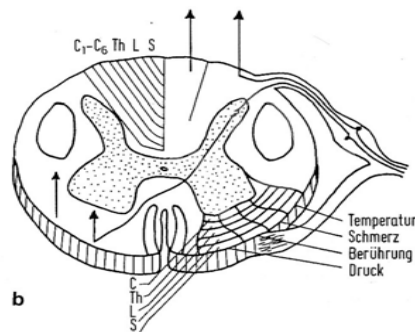
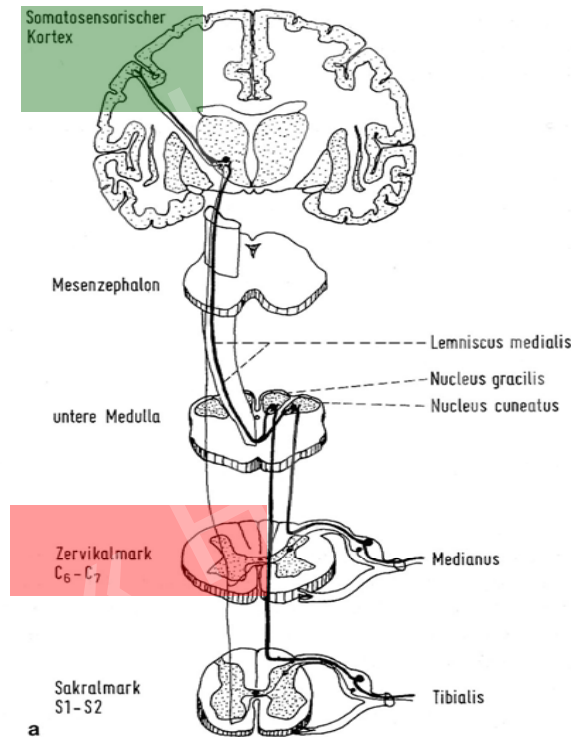
Danke für Ihre Aufmerksamkeit



SSEP somato-sensibel evozierte Potentiale



periphere Nervenleitung



Zentrale Nervenleitung

