Clinical Uses of Botulinum Toxin: Case Presentations

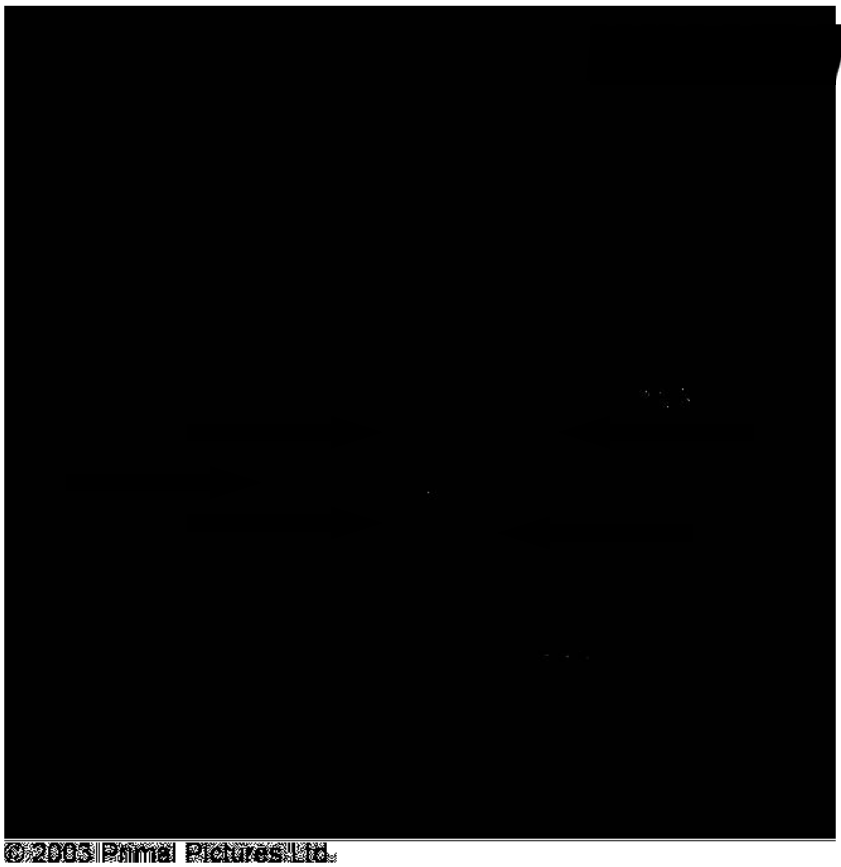
Albert C. Clairmont, MD
Associate Professor-Clinical
Department of PM & R
The Ohio State University

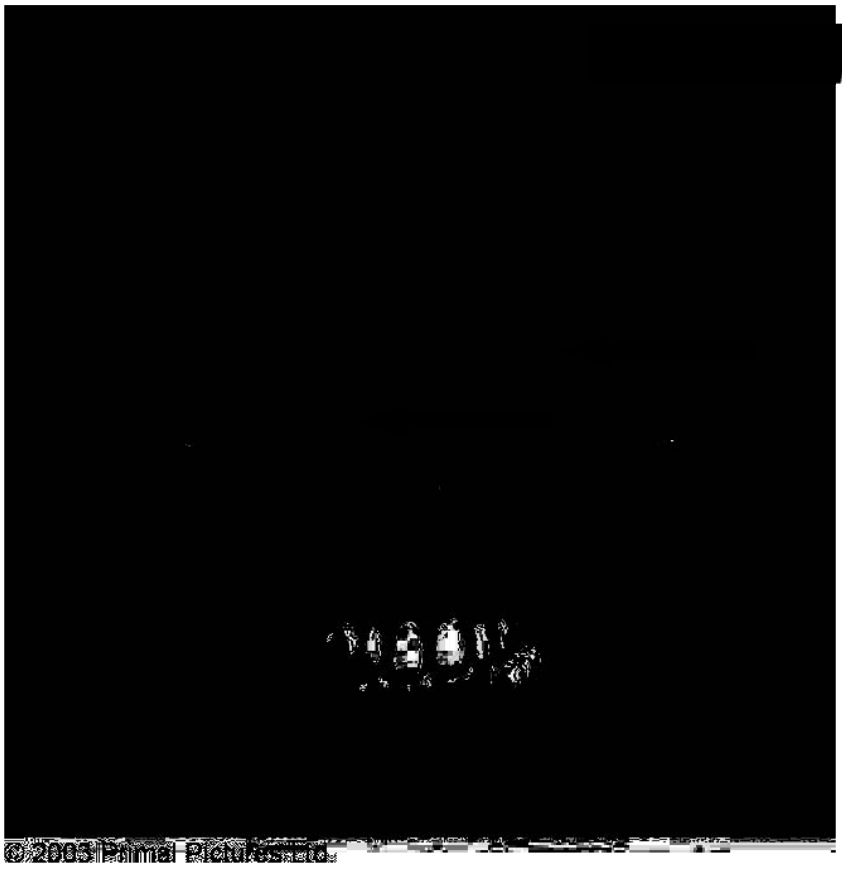
OBJECTIVES

- Review common clinical problems caused by spasticity and movement disorders
- Define management strategies available to clinicians
- Learn to identify appropriate candidates for botulinum toxin therapy
- Understand when (and how) to employ botulinum toxin

OBJECTIVES

- Understand when and how to employ other agents
- Be aware of the value of combination therapy when treating spasticity and movement disorders.
- Become familiar with techniques to identify muscles likely to benefit from interventions





Format: Case Presentation

Problems related to spasticity & movement disorders

- Pain and discomfort
- Impaired use of limb(s); walking, transfers, inability to perform activities of daily living
- Incoordination
- Weakness
- Deformity

Problems related to spasticity & movement disorders

- Non restful sleep
- ⇑ Burden of care
- Personal hygiene
- Lowered self esteem
- Decreased social contacts
- Issues of intimacy

Functional Objectives

- Improve potential for therapeutic outcomes
- Improve mobility
- Improve ADL
- Maximize pain relief

Brin. *Muscle Nerve*. 1997;20:S208.

Functional Objectives

- Decrease effect of hypertonicity on quality of life
- Improve range of motion (ROM)
- Improve tone
- Improve outcomes from the PT/OT

Brin. *Muscle Nerve*. 1997;20:S208.

Major categories of objectives

1. Comfort (usually pain relief and issues of hygiene)
2. Function

STROKE

PLUS

PRIMARY LATERAL SCLEROSIS

CASE PRESENTATION

- Assessment: What are the problems and limitations imposed by her spasticity?
- Goals
- Evaluate options

CASE PRESENTATION

- 88 y.o. w♀ w complicated history
- Stroke ⇒ spastic R hemiparesis in 2000
- Recovered; could walk w walker and AFO after stroke ⇒ cane
- Required kidney stent; two attempts
- Noted ⇑⇑ tone R side
- Regressed to walker, then wheelchair

CASE PRESENTATION

- Experiencing B lower limb dystonia & severe inner thigh pain
- Difficulty w personal hygiene
- Difficulty w toileting related to time required for transfers. ON LASIX!!
- Cognitive function excellent
- Distressed
- Neurologist Dx Primary lateral sclerosis

CASE PRESENTATION

- R knee 4/4 MAS; hip 3, ankle 4/4
- L knee 3/4 MAS, hip 3, ankle 1+/4
- Note: She is sitting in a wheelchair. R knee is in flexion and cannot move actively or passively.
- Goal: TOILETING.
- Rx options

CASE PRESENTATION

- Six % phenol or 98% alcohol
- Pros and cons
- Intrathecal baclofen pump: Had severe reaction to oral baclofen requiring hospitalization. **Lost consciousness**
- Botulinum toxin injections
- Pros and cons

CASE PRESENTATION

- Six years post stroke
- Day of injection, hip adductors 4/4 MAS
- Botulinum toxin type A
- 23-gauge 75 mm injectable needle electrode
- R adductor longus 50 U x 6
- L adductor longus 50 U x 6
- Total 600 Units

CASE PRESENTATION

- 3 weeks after botulinum toxin injections
- “I am happy”
- **NO THIGH PAIN**
- 90% reduction in toileting accidents
- Easier to transfer
- Hip adductors: low side of 3/4 MAS
- Still on LASIX

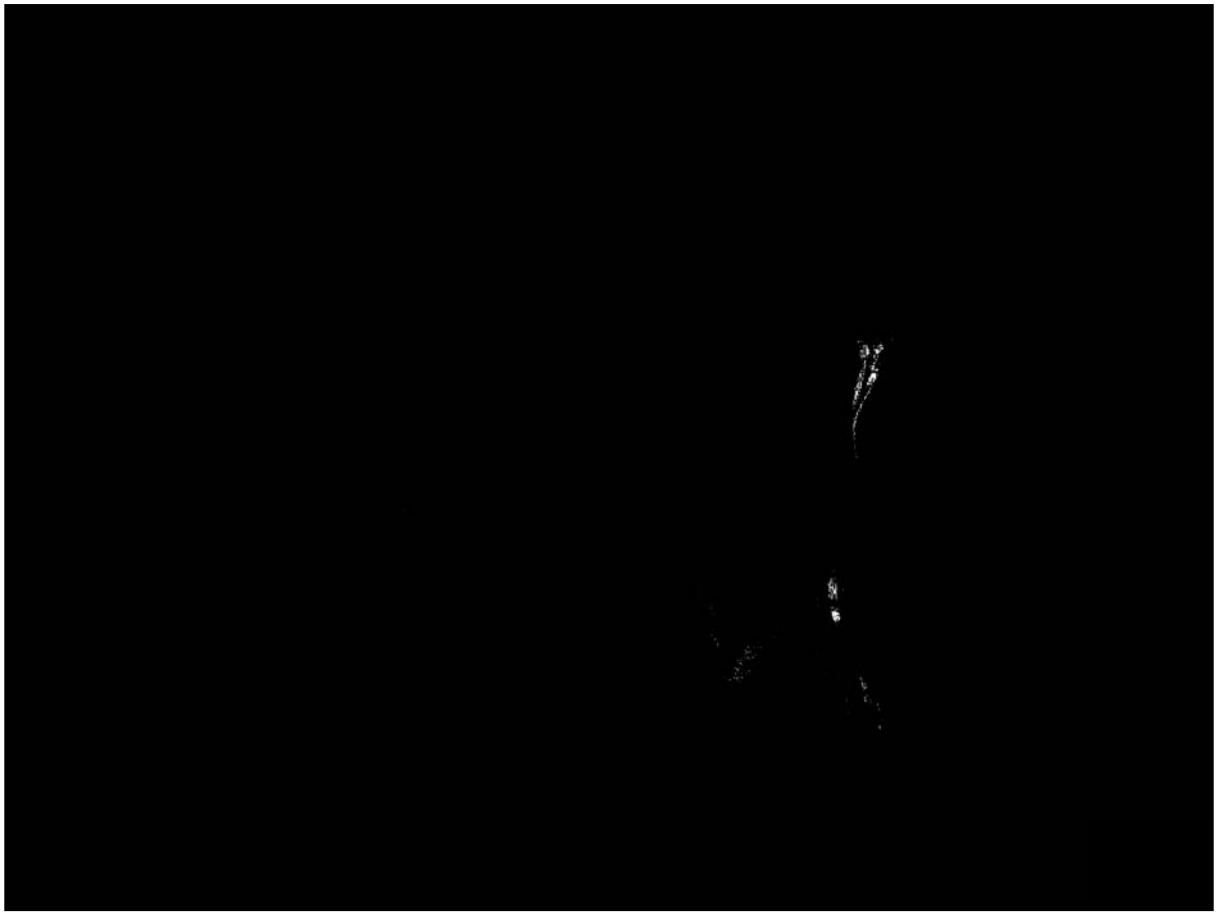
CASE PRESENTATION

MULTIPLE SCLEROSIS

CERVICAL DYSTONIA

Multiple Sclerosis

- 63yr. old woman w long H/O MS
- C/o chronic stiff, tight, painful lateral bent neck
- Co-existent schizophrenia and ischial pressure sore
- Obligatory wheelchair user



Multiple Sclerosis

Right side

- Sternocleidomastoid 30 U
- Levator scapulae 10 U
- Splenius capitis 20 U
- Cervical Trapezius 20 U

Left side

- Splenius capitis 10U
- Cervical Trapezius 10U

- Total = 100 U

OnabotulinumtoxinA

TORTICOLLIS

TORTICOLLIS

- 24 y.o. “referee” in domestic dispute
- Intervened in cat vs dog confrontation
- Cat bit his left hand, dorsal aspect
- Persistent hand pain & swelling
- Hospitalized 1 ½ days; given I.V. antibiotics
- Abnormal neck positioning began @ DC

TORTICOLLIS

- C/O progressively increasing neck spasms, causing increasing neck pain
- Neck stiffness
- Difficulty turning or controlling the neck
- Presents for evaluation about 4 months later

BEFORE TREATMENT

TORTICOLLIS. TREATMENT

LEFT

- Cervical trapezius
  20/10/10/5 U
- Trapezius ridge 10 U
- Levator scapulae
  20/15/10 U
- Splenius capitis
  20/10/10/5 U

RIGHT

- Sternomastoid 10 U
- Trapezius ridge
  10/10/20 U
- Latissimus dorsi 5 U

- Total = 200 U
  onabotulinumtoxinA

AFTER BOTULINUM TOXIN

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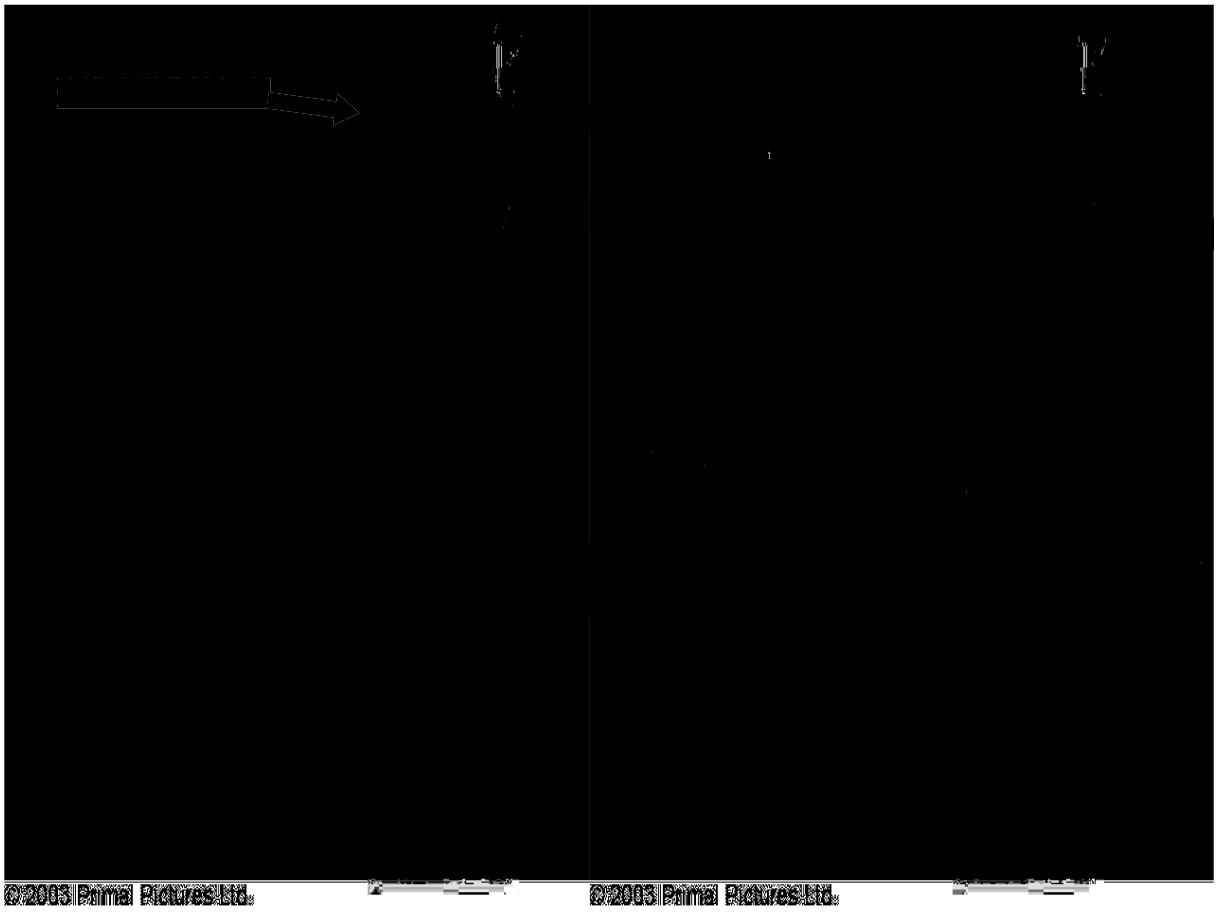


INJECTION TECHNIQUE

SPLENIUS CAPITIS

MULTIPLE SCLEROSIS

LIMB DYSTONIA

Multiple Sclerosis

- 71 yr. old woman w 20 yr. H/O MS
- Right hand dominant
- Severe ROM restriction at right elbow
- Lost ROM right elbow one year ago
- Frozen elbow after 3-week hospitalization
- R. hand works but is limited by elbow issue
- Obligatory wheelchair user

Partial List of Problems

- Cannot cook or do bimanual activities
- Cannot perform ADLs
- Donning a blouse or any top is difficult
- Restricted types of dress wear
- Emotional distress secondary to above

Physical Examination

- Right elbow fixed in fully flexed position
- Passive ROM < 20º from flexed position
- ¾ Modified Ashworth Scale at the elbow
- No forearm pronation or supination
- Full finger function and good wrist flex/ext
- Shoulder ROM to 100º of abduction

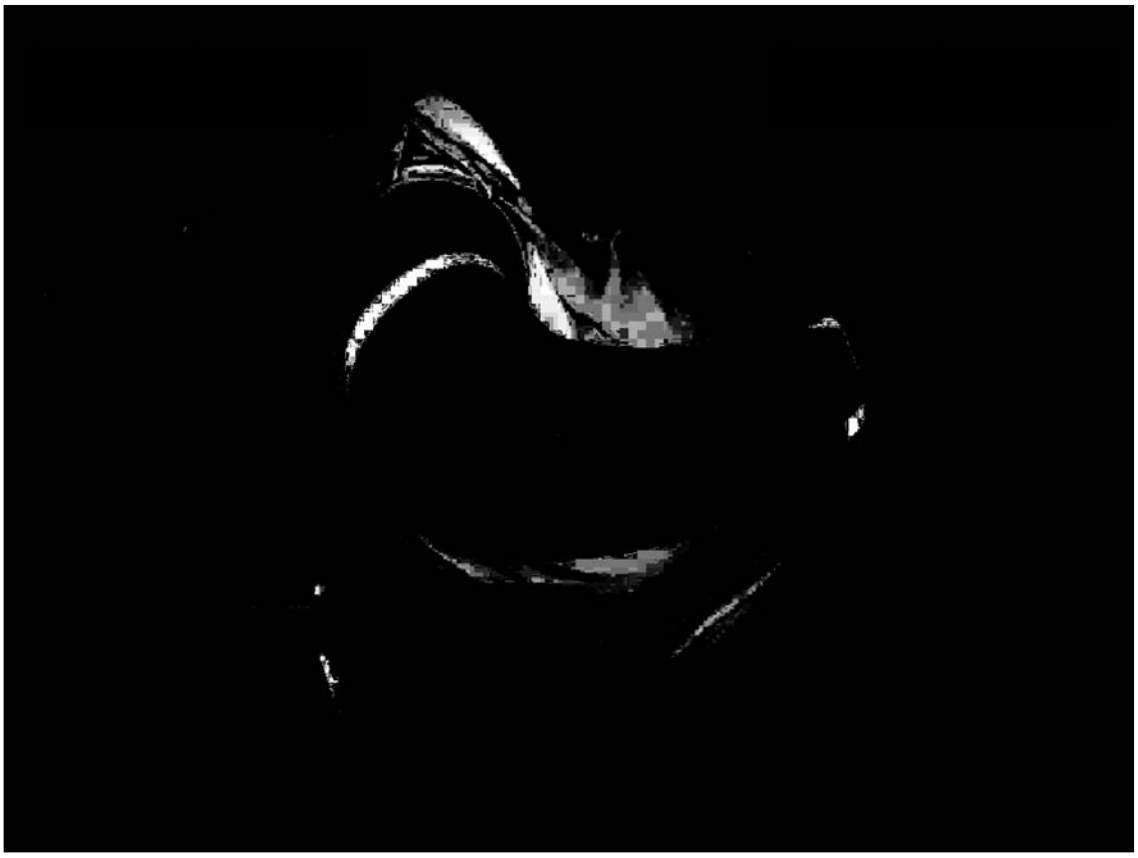
Major Goals

- Active function of right upper limb
- Improve ROM right elbow
- Improve all aspects of ADLs
- Cook breakfast

Treatment

- Botulinum Toxin Type A 200 Units
- Biceps brachii 50 U x 2
- Brachioradialis 50 U, 30 U, and 20 U
- Only 2 MUAPs recorded in biceps w maximum voluntary effort or strong pull on flexed elbow (disuse/suppressed axons)

6 WEEKS AFTER BOTULINUM TOXIN INJECTION



Ext Splint

AFTER

AFTER

12 WEEKS AFTER INJECTION

COOKS BREAKFAST REGULARLY

Wears any style of clothing that she pleases

Full interference pattern on EMG of right biceps

Incomplete spinal cord injury
Lumbar stenosis
Neuropathic Pain

Spasticity & Neuropathic Pain

- 68 y.o. man w complicated history
- SCI at age 23. Complete tetra → Incomplete, w "normal function"
- Residual lower limb weakness; walked without assistive device
- 1986, toured Europe independently
- 1994, back pain referred to the L foot

Spasticity & Neuropathic Pain

- 1994: Dx spinal stenosis/surgery; Fusion L4-5→"Good results"
- Recurrent back pain→ Surgery Feb 2011
- Fusion L2-3, L3-4
- Started PT April 2011; hamstring stretch
- Persistent back pain starting 3 hrs after PT…

Spasticity & Neuropathic Pain

- Back pain worsens with wearing clothes
- Max tolerance 4-5 hrs; must doff clothes
- Many modalities tried without success
- Local anesthetic block→ limited relief x 1
- More surgery excluded
- Therefore, consult for spasticity evaluation
- Botulinum neurotoxin injections?

Pain Medications @ Evaluation

- Fentanyl 50 mcg TD Q 3 days
- Oxycodone 30 mg Q 6 h prn
- Gabapentin 1200 mg bid
- Lyrica 150 mg po bid
- Acetaminophen 650 mg 2 tabs Q 8 h prn
- Tizanidine 4 mg bid
- Diazepam 15 mg Q hs

Pain Medications @ Evaluation

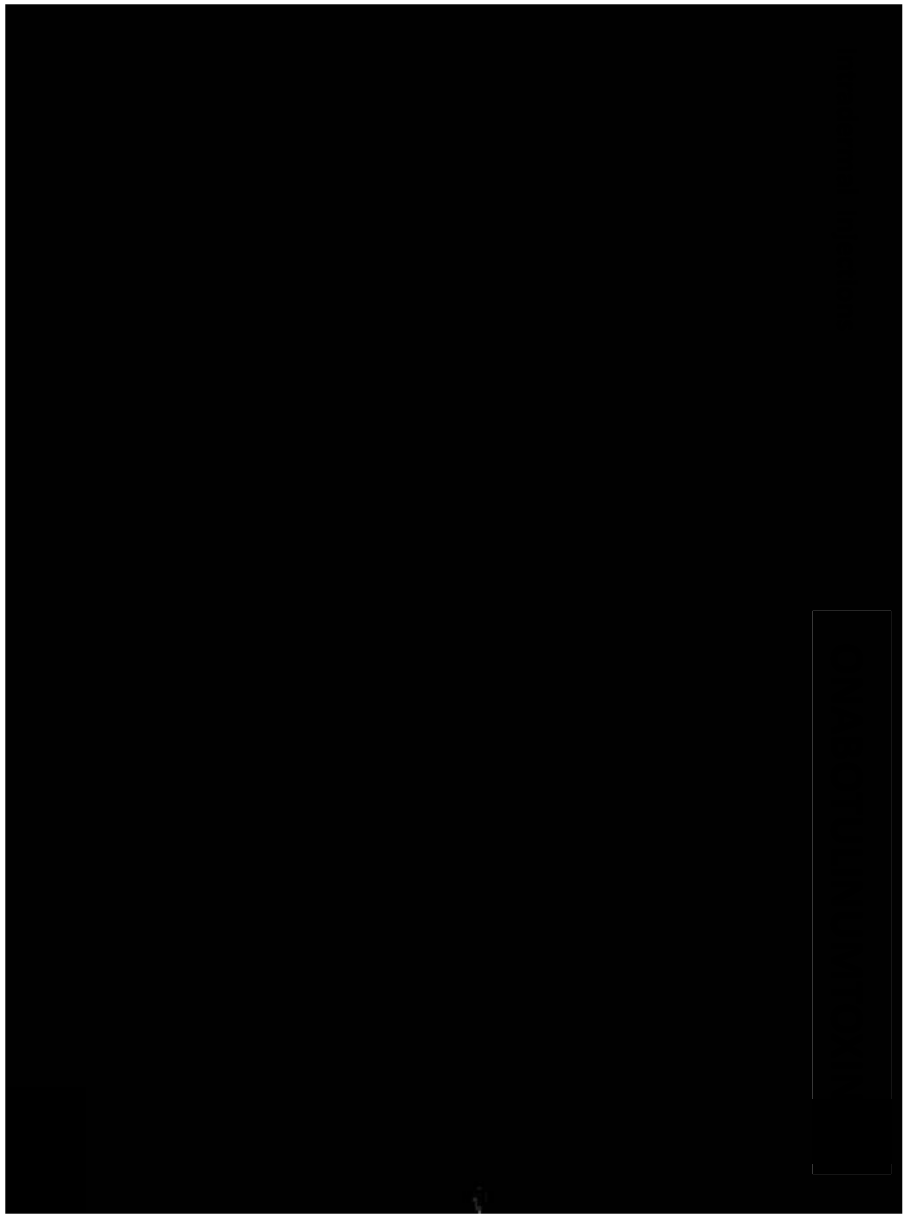
- Capsaicin, 1 application tid prn
- 5% Lidocaine patch, apply 1-3 Q 12 h
- Voltaren 1% gel, 2 applications Q 4 h
- PAIN MODALITY: TENS

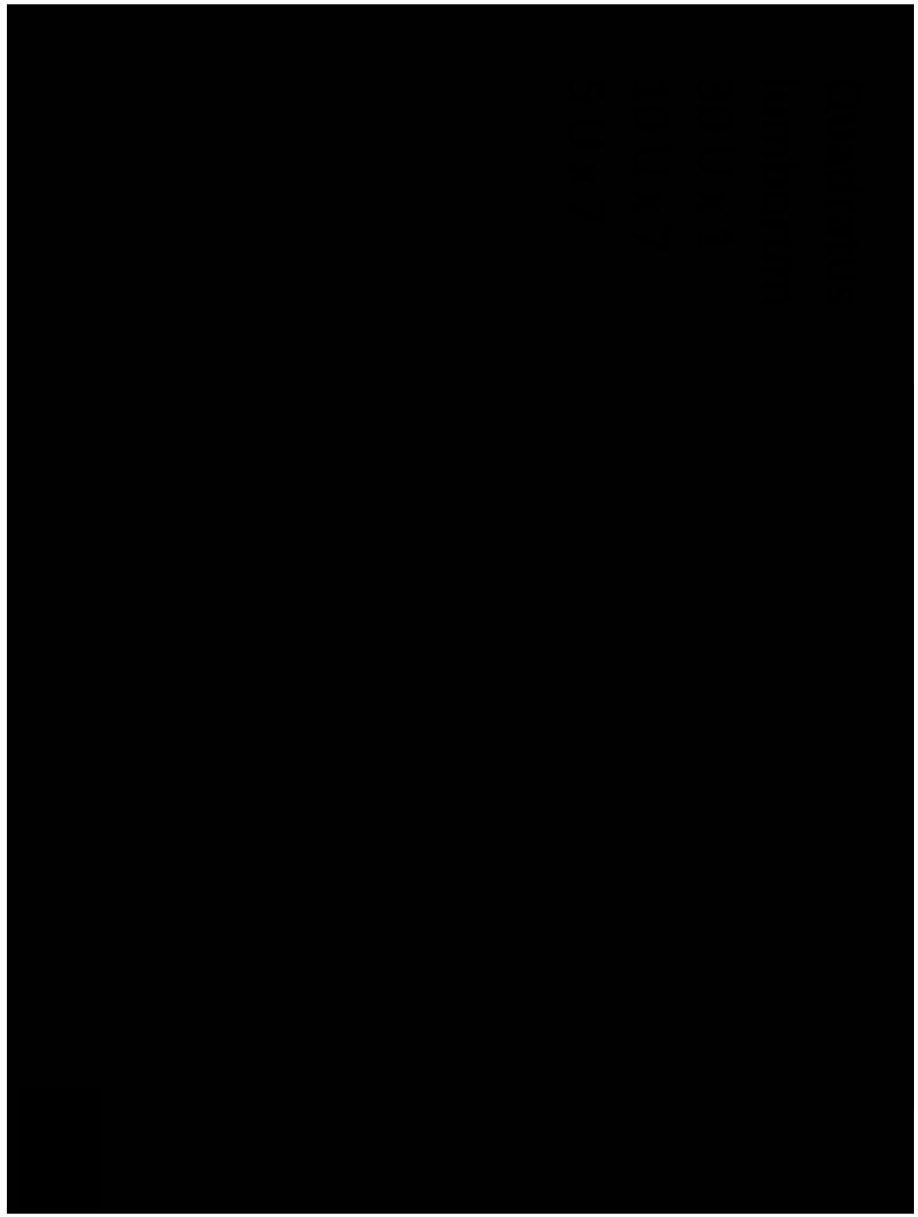
Physical Examination

- Multiple scars on back
- Tender spot on left flank/quadratus lumborum
- Slight ↑ tone in the lower limbs ~ ¼ Modified Ashworth at the R knee

Impression

1. Left low back pain
2. Incomplete spastic tetraparesis
3. Complex regional pain syndrome
4. Late effect of spinal cord injury
5. Lumbar stenosis
6. Late effects of low back surgery (failed back surgery syndrome)





RESULT

- PAIN RESOLVED
- L flank spasticity pain ~ 2 1/2 months
- Inter-injection interval pain free for neuropathic pain
- Can wear garments 11-12 hours/day
- ↓ use and intensity of TENS
- Can ride in an automobile freely

Jabbari, Maher, Difazio. PAIN MEDICINE. Vol 4. Number 2. 2003

HYPERHIDROSIS

HYPERHIDROSIS

- 34 y.o. male with acute onset of hyperhidrosis 8 months previously
- ↑ Sweating of palms & soles
- Changes 4 pairs of socks/day
- Progressively worse. ↑↑ intake H_20
- 1st morning sample of urine is Dark & strongly scented

HYPERHIDROSIS

- No family H/O hyperhidrosis
- Endocrinopathy w/u negative
- Various medications tried without success
- Consultation request for botulinum neurotoxin injections or iontophoresis

HYPERHIDROSIS

- Iodine & corn starch to highlight areas
- Initial Rx: OnabotulinumtoxinA 200 units
- 2 mL Pres free Saline per 100 unit vial
- 1 mL syringe: 50 units/mL
- ~ 1-2 cm grid
- 2.5 U/site
- Local anesthesia

PARKINSON'S

RIGHT UPPER LIMB TREMOR

Parkinson’s

- 85 y.o. man with long H/O Parkinson's
- Does not know why he is at the office
- Left upper limb rigid and painful
- Hand fisted, impossible to open voluntarily
- Cannot clean left palm

Physical Examination

- Tightly fisted left hand, without tremor
- 4/4 modified Ashworth Scale
- Rigid left elbow
- Typical tremor of right upper limb
- Hard of hearing

RIGHT UPPER LIMB TREMOR

PARKINSON'S

PRIOR TO TREATMENT

[redacted]

OBJECTIVES

- Pain relief, left upper limb
- Open left hand for cleaning
- Decrease tremor of right upper limb

TREATMENT

- Botulinum Toxin Type A 500 Units
- R. side: FCU, FDS, FDP, total 60 U
- L. side: 440 Units
- Triceps 30 U; FPL 30 U; Br radialis 30 U
- FDP, FDS, FCR total 340 U

Persistent right upper limb tremor

- Reapplication to R. upper limb p 10 months
- FCR 10 units
- Long head of biceps brachii 10 units

5 MONTHS LATER

AFTER BOTULINUM TOXIN INJECTIONS

PARKINSON'S

[redacted]