

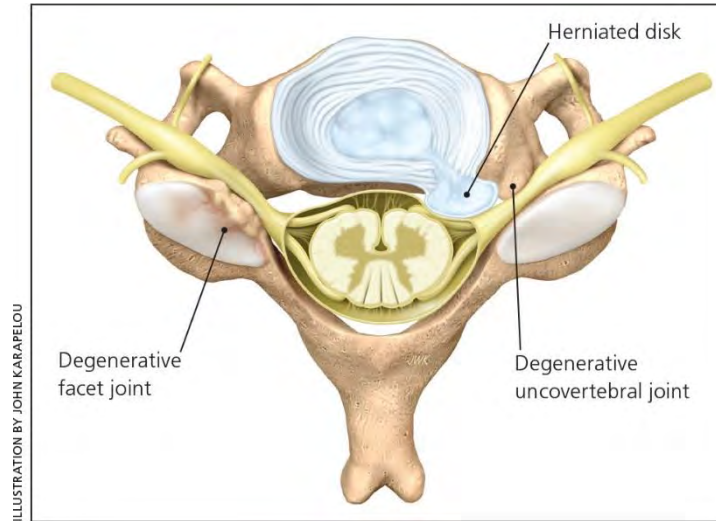


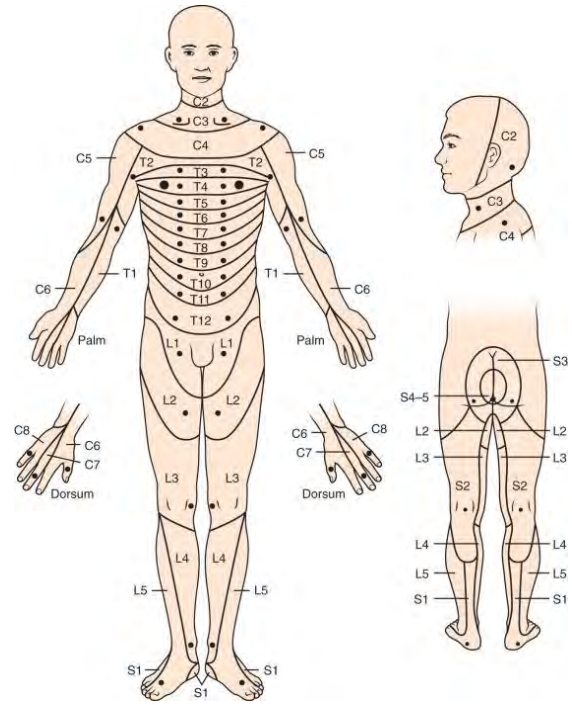
Differentialdiagnose und Therapie des CRS

Dr. Gérard Hämmerle

SAMM Kongress November 2021

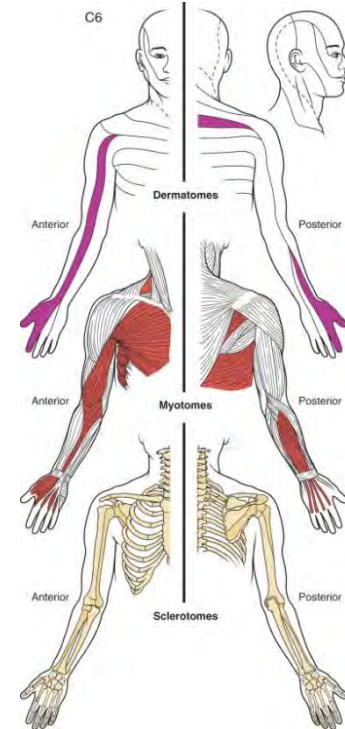
CRS Definition



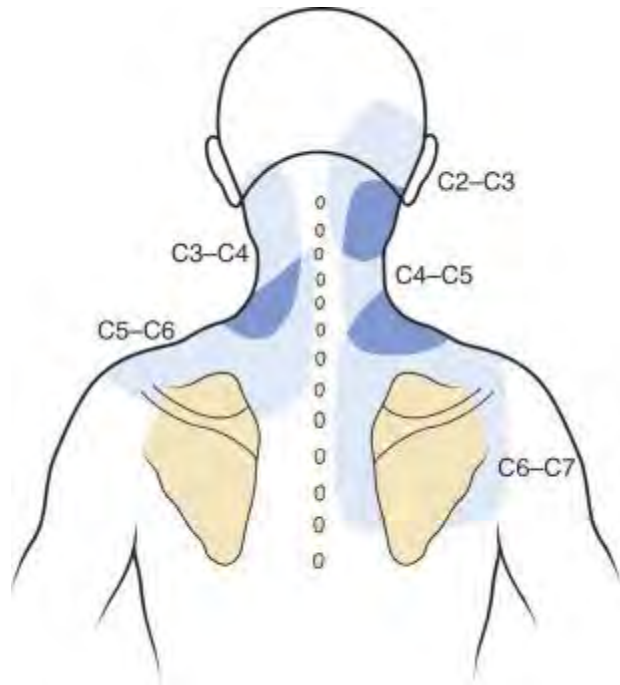


From Bland JH: *Disorders of the Cervical Spine: Diagnosis and Medical Management*, 2nd ed. Philadelphia, WB Saunders, 1994.

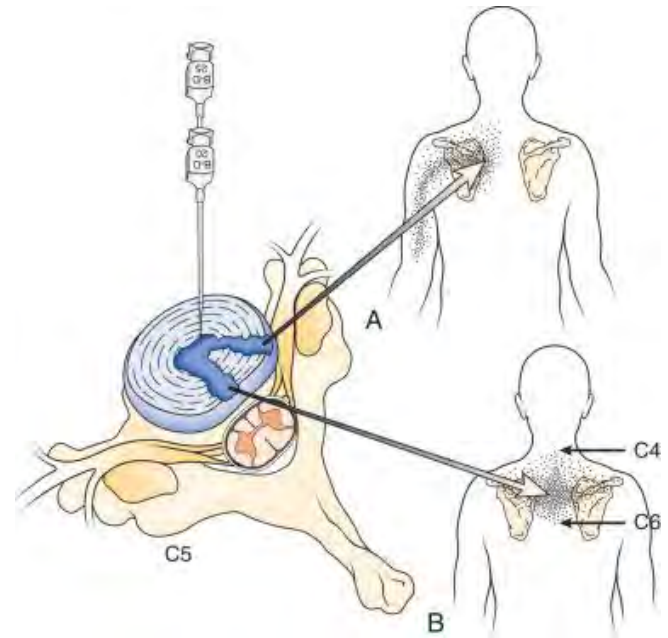
Radikuläre Ausstrahlung des Spinalnervs



From Bland JH: Disorders of the Cervical Spine: Diagnosis and Medical Management, 2nd ed. Philadelphia, WB Saunders, 1994.

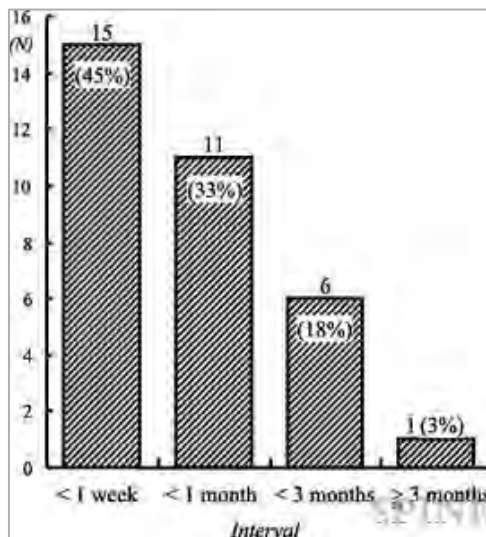
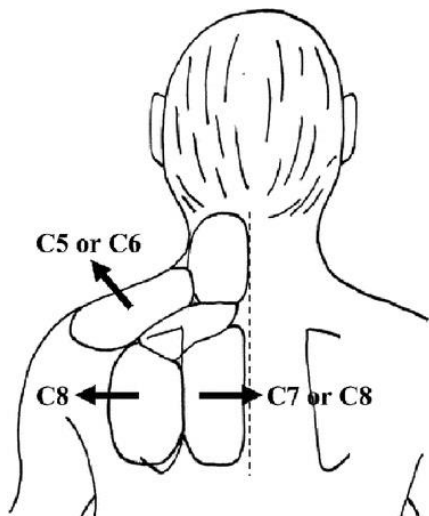


N. Bogduk
 Physical medicine and rehabilitation clinics of North America 2003
 The anatomy and physiology of neck pain



Cloward, R. B. (1959).
 Cervical diskography: a contribution to the etiology and mechanism of neck, shoulder and arm pain
 Annals of Surgery, 150(6), 1052.

Der penetrante peri/interskapuläre Schmerz "The precursor"

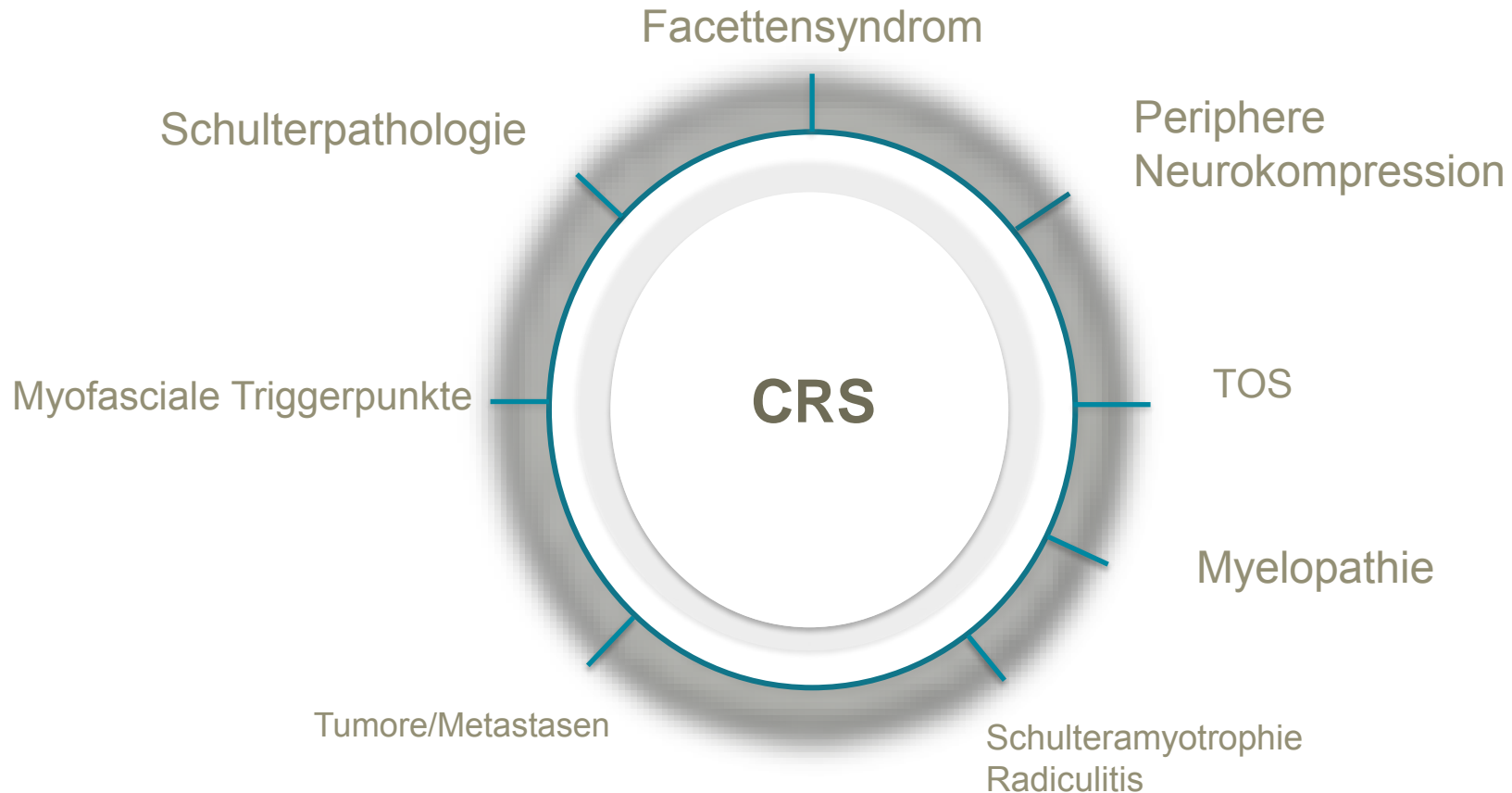


Cervical Roots as Origin of Pain in the Neck or Scapular Regions

Tanaka, Yasuhisa; Kokubun, Shoichi; Sato, Tetsuro; Ozawa, Hiroshi

Spine31(17):E568-E573, August 1, 2006.

Differentialdiagnosen



Spurling Test (Lateralflexion / Homolaterale Rotation/ Extension)



- Reproduktion des Memory Pain
- Im Seitenvergleich testen
- **Spezifischer Test**
- Sensitivität ?

Neck Tornado Test (Lateralflexion / Homolaterale Rotation/ **FLEXION**/EXTENSION)



- Modifizierter Spurling
 - Test in 4 Positionen
- Reproduktion des Memory Pain
- Im Seitenvergleich testen
- Sensitiver als Spurling

Int J Med Sci. 2017; 14(7): 662–667.

Diagnostic Accuracy of the Neck Tornado Test as a New Screening Test in Cervical Radiculopathy

Juyeon Park,¹

ULT 1 Test



- 4 Schritte
- Reproduktion des Memory Pain
- Im Seitenvergleich testen
- Sensitiver Test

Arm Abduction Test



- Flache prониerte Hand auf den Kopf
- Positiv bei Verbesserung der Ausstrahlung
- Diskriminierung Nacken/Schulterpathologie

Palpation Sulcus nervi spinalis



- Korrekte Palpation
dd: Mm. Scaleni
- Reproduktion des
Memory Pain
- Im Seitenvergleich
testen
- Validität unklar

Sensitivity and Specificity of Special Tests to Detect Cervical Radiculopathy^a

Test and Author	Gold Standard Used for Diagnosis	Subjects with Disease	Subjects Without Disease	Sensitivity	Specificity	+LR	-LR
Distraction							
Viikari-Juntura et al ¹⁵	Myelography	9	35	0.44 (0.14–0.79)	0.97 (0.85–1.0)	14.7	0.58
Wainner et al ³	Needle EMG/NCS	19	63	0.44 (0.21–0.67)	0.90 (0.82–0.98)	4.4	0.62
Spurling's							
Shah and Rajshekhar ²¹	MRI and operative findings	29	21	0.93 (0.77–0.99)	0.95 (0.76–1.0)	18.6	0.07
Tong et al ¹⁹	EMG	20	172	0.3 (0.12–0.54)	0.93 (0.88–0.96)	4.29	0.75
Wainner et al ³	Needle EMG/NCS	19	63	0.50 (0.27–0.73)	0.86 (0.77–0.94)	3.6	0.58
Shoulder Abduction							
Davidson ²²	Myelography	18	4	0.78 (0.52–0.94)	0.75 (0.19–0.99)	3.1	0.29
Viikari-Juntura et al ¹⁵	Myelography	13	13	0.46 (0.19–0.75)	0.85 (0.55–0.98)	3.1	0.64
Wainner et al ³	Needle EMG/NCS	19	63	0.17 (0.0–0.34)	0.92 (0.85–0.99)	2.1	0.90
Upper Limb Tension Test							
Quintner ²³	Plain-film radiography of the cervical spine	18	27	0.83 (0.59–0.96)	0.11 (0.02–0.29)	0.93	1.5
Wainner et al ³	Needle EMG/NCS	19	63	0.97 (0.90–1.0)	0.22 (0.12–0.33)	1.2	0.14

EMG / NCS, Electromyography/nerve conduction study; -LR, negative likelihood ratio; +LR, positive likelihood ratio; MRI, magnetic resonance imaging.

^a Downloadable form available at ExpertConsult.com.



Frau B., 36 j. überwiesen von Osteopathen zur Behandlung von eines CRS

- Erstmals Nacken Sz mit Parästhesien in den Fingern I-III rechts vor 2 Jahren, keine Armschmerzen
- Schmerzen über Monate interskapulär rechts
- 3x Behandlung mit MMI der HWS mit regredienter Symptomatik bis nach der Schwangerschaft
- Aktuell **nächtliche Armschmerzen rechts** mit Kribbelparästhesien

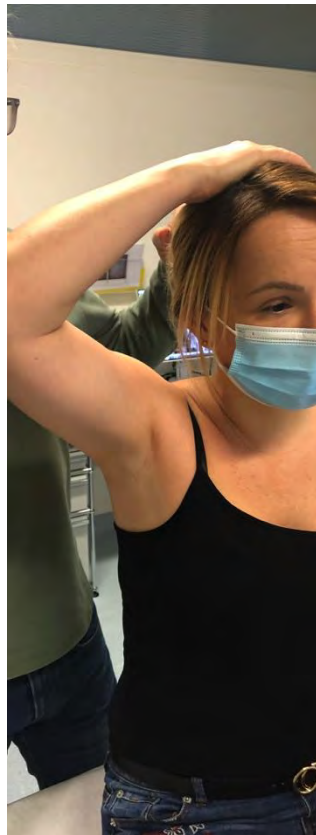
Spurling neg.



Tornado pos



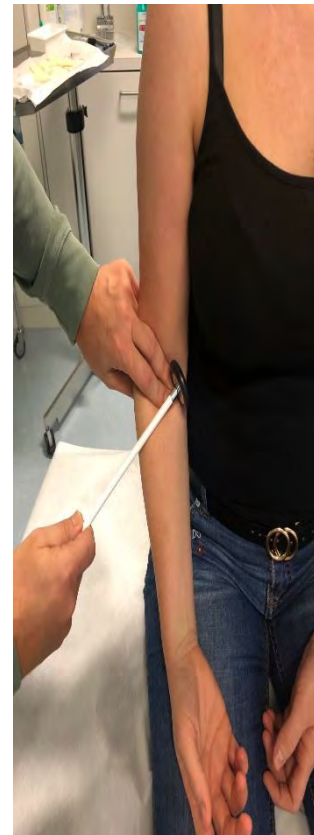
Arm Abduction pos



ULT T.1 pos

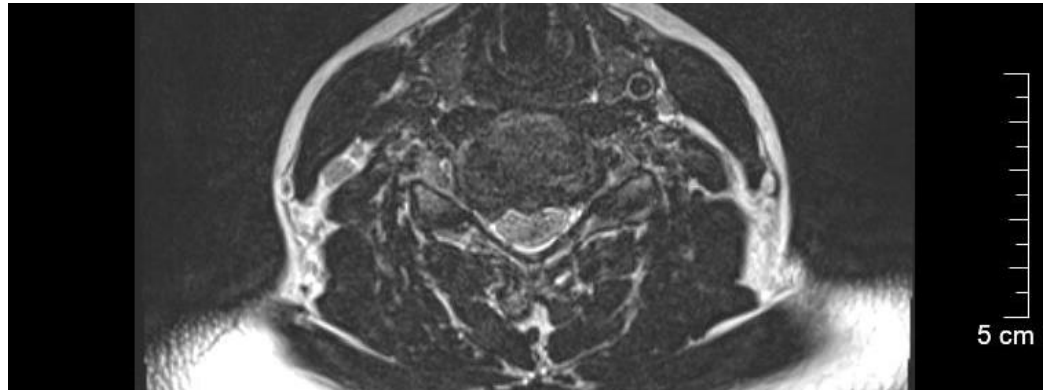
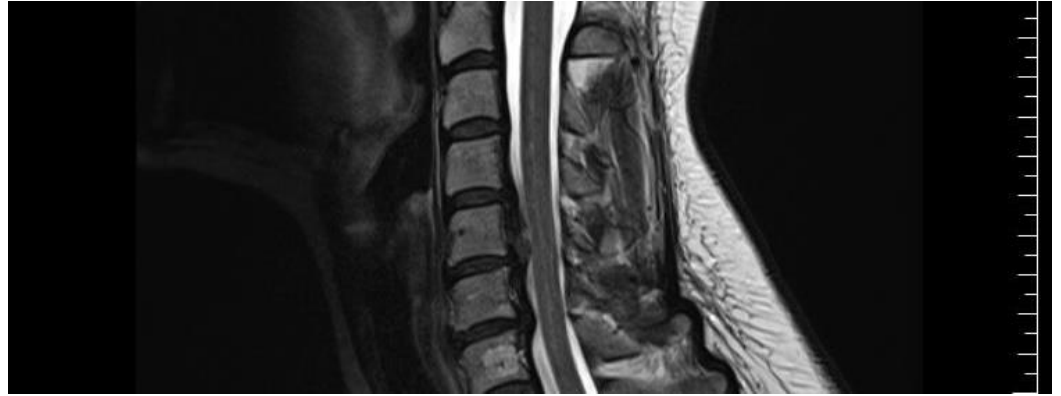


Neurologie normal



Was nun ?

- Neck Tornado positiv
- Spurling negativ
- Arm Abduction Positiv
- ULT Test 1 positiv
- Neurologie bland
Insbesondere keine
Myelopathie Zeichen



Stellenwert der Konservativen Therapie

Spine 1997 Apr 1;22(7):751-8. **Persson LC et al**

Department of Neurosurgery, University Hospital, Lund, Sweden.

Long-lasting cervical radicular pain managed with surgery, physiotherapy, or a cervical collar. A prospective, randomized study.

conclusion:

- Surgery slightly better in the first months
- In the treatment of patients with long-lasting cervical radicular pain, it appears that a cervical collar, physiotherapy, or surgery are equally effective in the long term.

Eur.Spine J. 1997;6(4):256-66. Persson LC et al.

Department of Neurosurgery, University Hospital, Lund, Sweden.

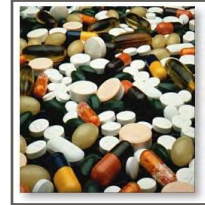
, Cervical radiculopathy: pain, muscle weakness and sensory loss in patients with cervical radiculopathy treated with surgery, physiotherapy or cervical collar. A prospective, controlled study.

conclusion:

- We conclude that pain intensity, muscle weakness and sensory loss can be expected to improve within a few months after surgery,
- while slow improvement with conservative treatments and recurrent symptoms in the surgery group make the 1-year results about equal.

CRS

Medikamentöse Therapie



Empirie

- NSAR
- Analgetika
- Muskelrelaxans
- Steroide
- Opioide
- Antikonvulsiva

EBM

Akutem Verlauf

- Opioide
- Synthetisches Opioid

Chronischem Verlauf

- Antikonvulsiva
- Antidepressiva

The Effectiveness of Fluoroscopically Guided Cervical Transforaminal Epidural Steroid Injection for the Treatment of Radicular Pain; a Systematic Review and Meta-analysis Aaron Conger et al.

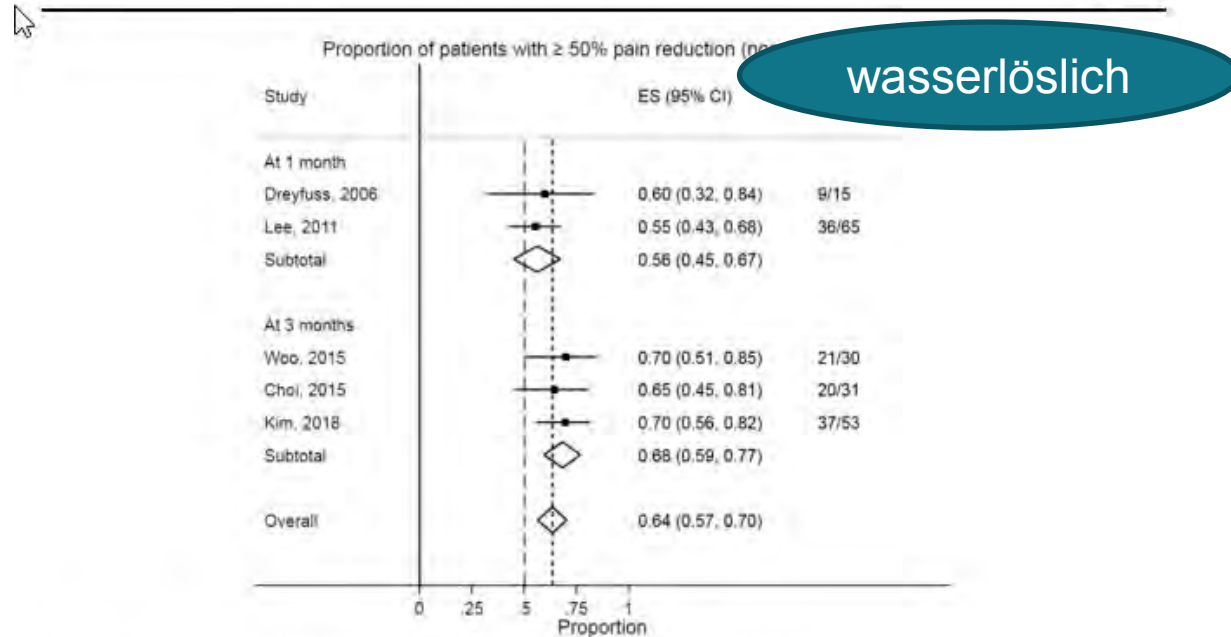


Figure 3. Forest plot of the success rates of CTFESI using non-particulate steroid at one and three months.

Epidurale Kortison Injektion



Keine Evidenz für Manipulationsbehandlung

Risikofaktoren für
Komplikationen

- Falsche Diagnose
- Neurologie unterschätzt
- Falsche Technik

Dvorak J, Kränzlin P, Mühlemann D. et al;
Musculoskeletal Complications; S. Haldemann:
Principles and Practice of Chiropractic.
Norwalk CT: Appleton and Lange 1992 pp 549-578

In **acute phase** of cervical **disc herniation** with **neurological deficit**, manipulation and mobilization of the affected segments are contraindicated as there is a high risk of spinal cord compression due to massive prolapse

Low Evidence

- Passiv

- Mobilisationen
- HVLA für CTÜ und/oder obere BWS. inkl Rippen
- NMI Techniken
- Nervenmobilisationen

-
- Allenfalls Traktionen
 - Weichteilbehandlung

- Aktiv

- Scapulafixatoren
- Tiefe HWS Muskulatur
- Pectoralis Stretch
- Median nerve Sliders

J Man Manip Ther. 2011 August; 19(3):
Effectiveness of manual physical therapy in the treatment of cervical radiculopathy: a systematic review Robert Boyles et al



Zeitpunkt der Operation

Chirurgische Intervention
nur

Schmerz trotz:
epiduraler Intervention
Analgetika
Manueller Therapie

Parese:
< M3
zunehmend ist

Merckpunkte

- Heterogenes Schmerzsyndrom
- Die klinischen Tests in der Kombination machen Sinn
- Bildgebung mit genauer Fragestellung
- Einzelne Therapiemodalitäten haben keine gute Evidenz
 - Ausser: Epidurale Steroid Injektionen und Opioide, Kortison oral ?
- Manipulation mit Impuls am Segment machen keinen Sinn.
 - Risiko / Nutzen schlecht
- Ca 10 % mit CRS müssen operiert werden

Folgerungen bei zervikaler Nerveninjektion

Malhotra et al. Spine 2009 Vol.34 pp.31-39

- Korrekte Technik und Erfahrung !!
- Keine synthetischen kristallinen GC
- Nur unter Visualisierung und Kontrastmittel
- Echtzeitverfahren sicherer (BV gesteuert)



Frau H, 37 J. überwiesen vom Hausarzt wegen invalidisierender Schmerzen

Junge Frau mit plötzlich auftretenden interskapulären Schmerzen li, auch nachts.
„Bohrender „ Schmerz

Tortikollis ähnliches Bild mit Bewegungseinschränkung nach li

- ULTT 1 positiv
- Spurling positiv
- Sulcus Zeichen positiv
- TSR asymmetrisch zu ungunsten links

Komplikation 1999-2003

Ma et al, JBJS Am.,2005:1025-30

Komplikation 1994-2007

Schellhas et al: Am JNeurology,2007:1909-14

- 1036 Injektionen bei 844 Patienten bei Ma et al
- 4612 Patienten bei Schellhas et al
- C Arm fluoroscopy, 25 gauge Nadel, Depot Medrol

- Keine schwerwiegenden Komplikationen
- 14 Patienten mit leichten reversiblen Nebenwirkungen

Complications of cervical spine manipulation therapy: 5-year retrospective study in a single-group practice

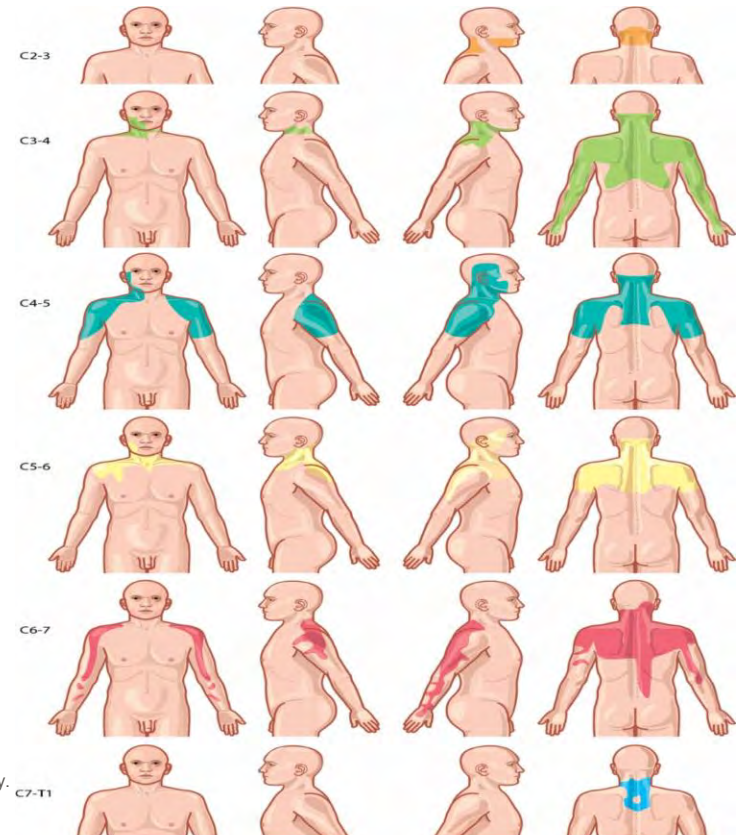
**DAVID G. MALONE, M.D., NEVAN G. BALDWIN, M.D., FRANK J. TOMECEK, M.D.,
CHRISTOPHER M. BOXELL, M.D., STEVEN E. GAEDE, M.D.,
CHRISTOPHER G. COVINGTON, M.D., AND KENYON K. KUGLER, M.D.**

Oklahoma Spine and Brain Institute, Tulsa, Oklahoma; and Texas Tech University, Author: provide city and state

Object. The authors report a series of 22 patients in whom major complications developed after cervical spinal manipulation therapy (CSMT). A second objective was to estimate the regional incidence of these complications and to compare it with the very low incidences reported in the literature.



Referred Pain der Bandscheiben

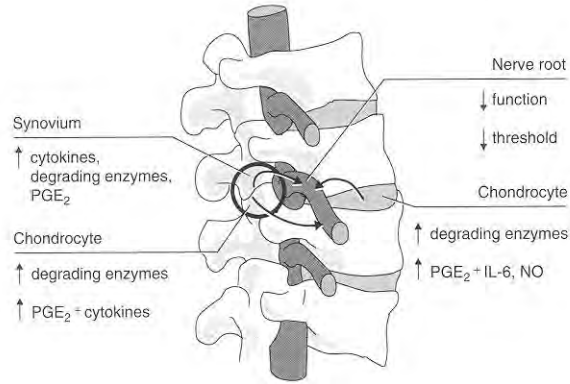


Neck Pain

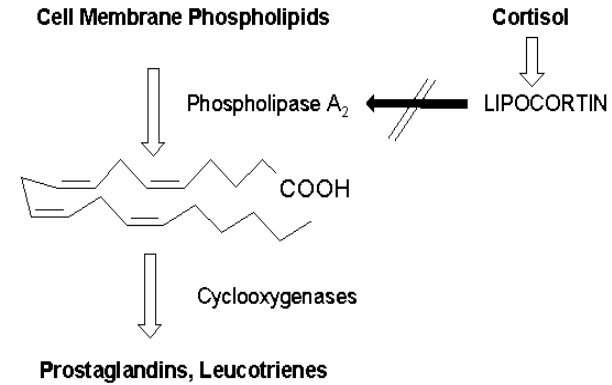
Map of referred pain patterns with provocative cervical discography for each cervical intervertebral disk. From Cervical discography. Interventional Pain Management. 5th ed. Elsevier; 2021:970-9, Figure 16-1.

Copyright © 2021 Elsevier

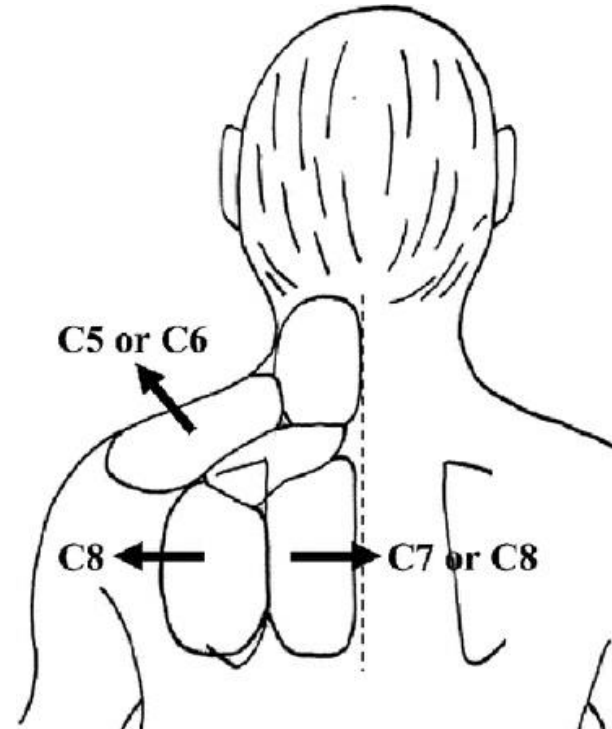
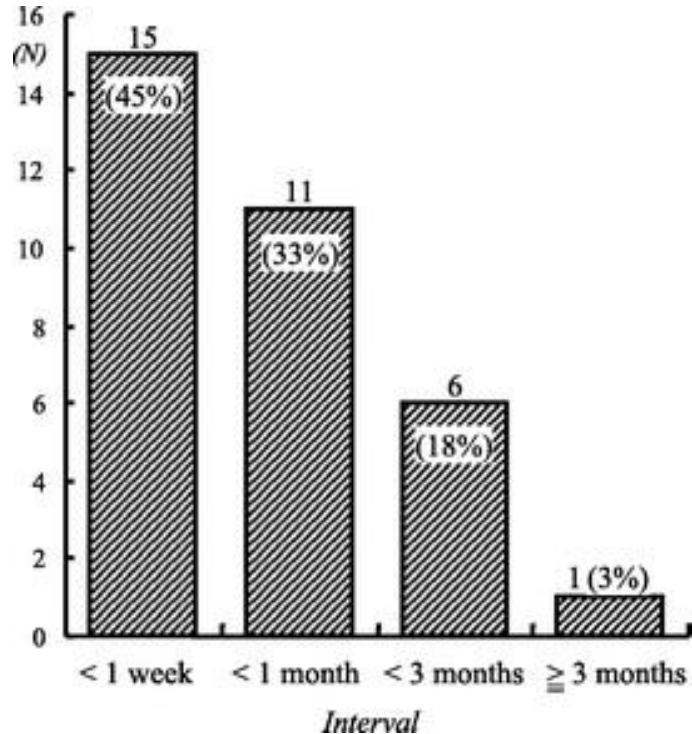
Entzündung

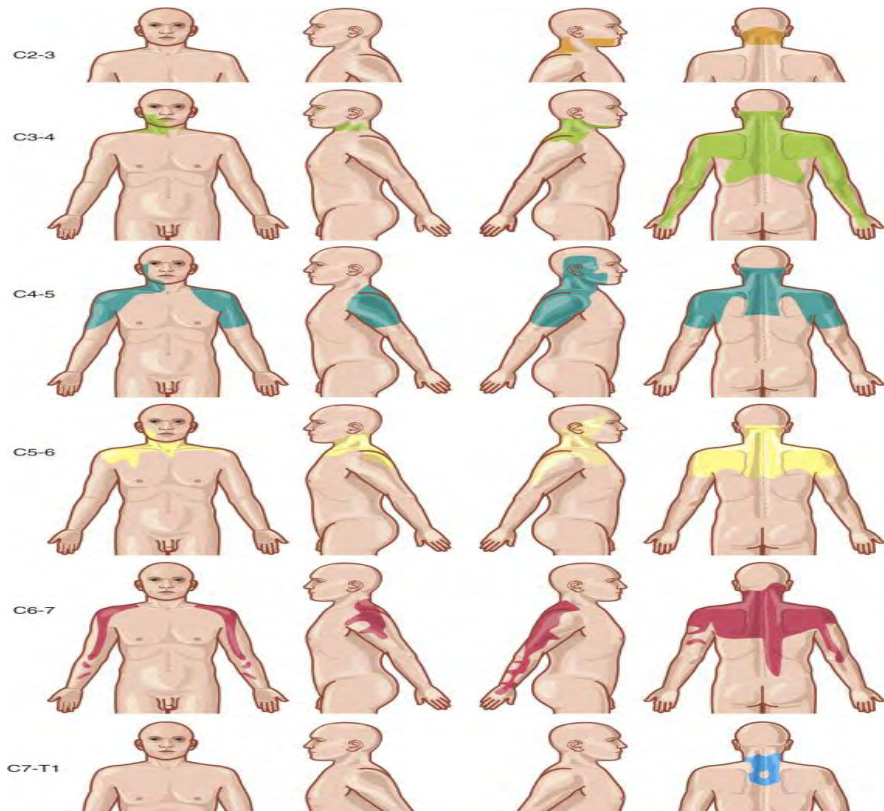


Effekte



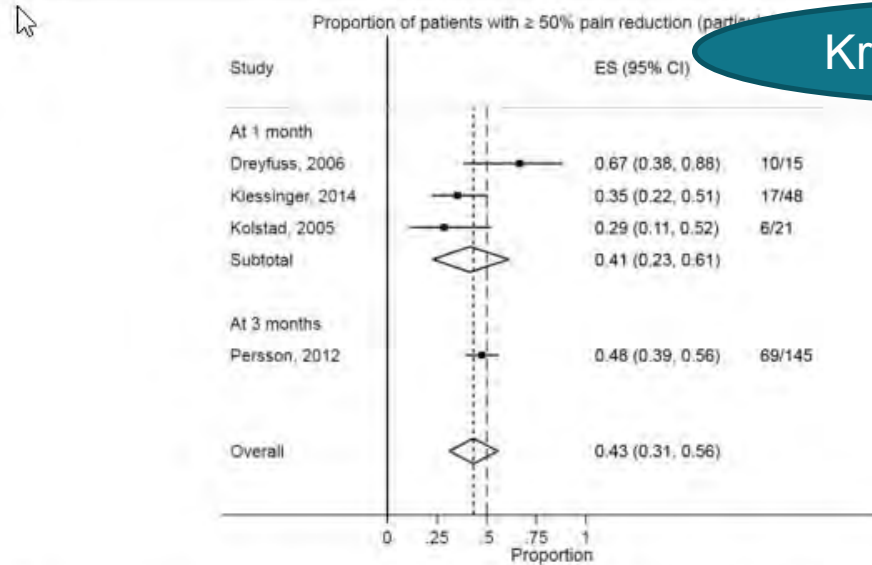
Der penetrante peri/interskapuläre Schmerz "The precursor"





The Effectiveness of Fluoroscopically Guided Cervical Transforaminal Epidural Steroid Injection for the Treatment of Radicular Pain; a Systematic Review and Meta-analysis Aaron Conger et al.

Systematic Review of Cervical Transforaminal Injection



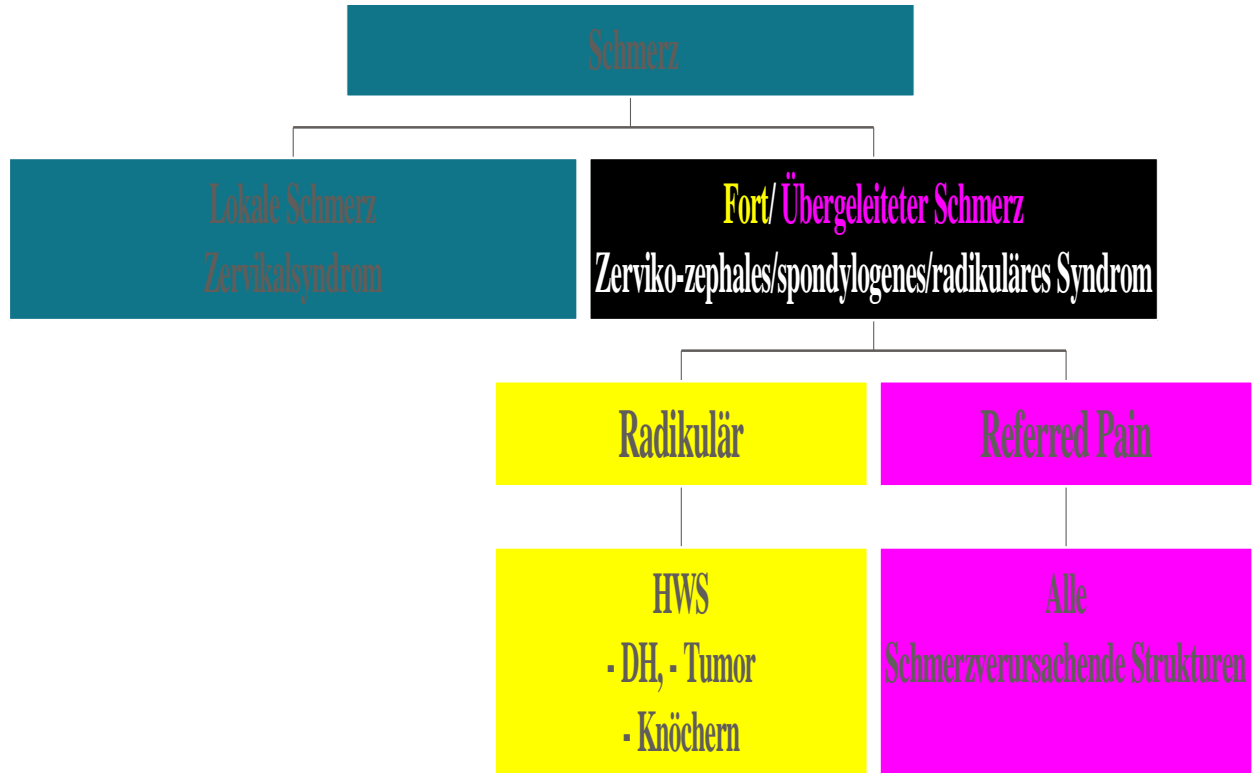
Kristallines Kortison

Figure 2. Forest plot of the success rates of CTFESI using particulate steroid at one and three months.

Datenlage

- Keine randomisierte Studie nur für die HWS
- Reduktion von über 75 % der Schmerzen bei über 70 % der behandelten Patienten
- Gute Evidenz in der akuten/subakuten Phase

Diagrammtitlel



Nondegenerative causes of radiculopathy

Diabetes mellitus
Vasculitis with nerve root infarction
Nerve root avulsion
Infectious or granulomatous
Herpes zoster
Lyme disease
Tuberculosis
Syphilis
Brucellosis
Cytomegalovirus
Histiocytosis X
Sarcoid
Infiltration
Lymphoma
Carcinomatous meningitis
Acute demyelination
Early Guillain-Barré syndrome

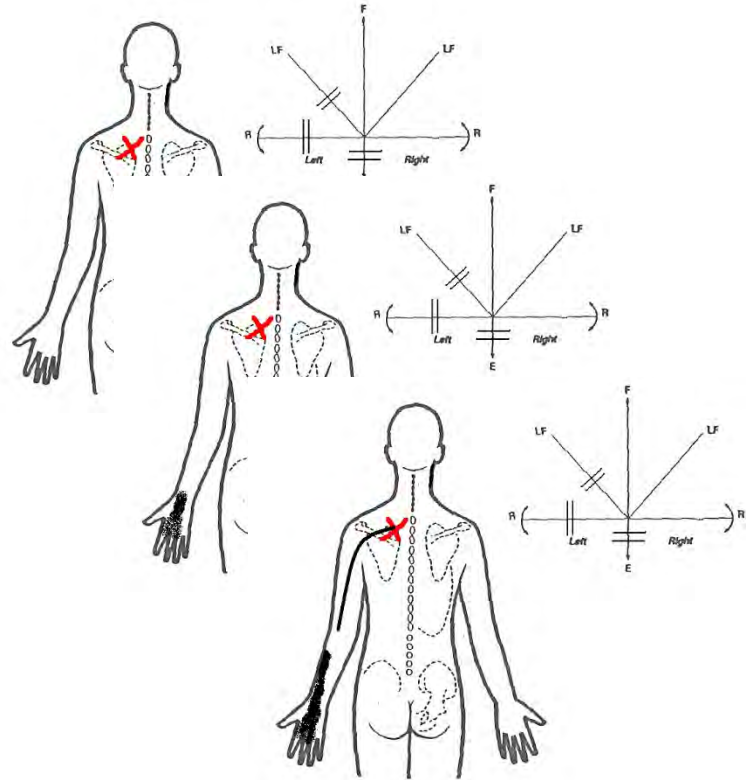
Anamnese



Interskapulärer Schmerz
Nachts meistens schlimmer
Armfixierung mit Erleichterung

Untersuchung

- **Inspektion**
 - Kopf in leichter Re-Rotation
- **Palpation**
 - IZ über C6/7 li und Rippe II+III li
 - Muskelhartspann Scalen/ Trap.desc.
- **Bewegungen**
 - Konvergenzstörung C6/7 li
- **Neurologie**
 - Triceps-Kraft li M4-5



Zahlen und Fakten

- Inzidenz: ca. 90 von 100000 Personen
- Am häufigsten in der 5 -6 Lebensdekade
- Knöchern zu weich 2:1
- Bilaterale Symptome in ca. 1/3
- In 3 -23 % durch Autounfälle verursacht
- C7 , C6, C5

Halskragen / Immobilisation

BMJ. 2009; 339.b3883.

Cervical collar or physiotherapy versus wait and see policy for recent onset cervical radiculopathy: randomised trial

Kuijper et al.

Conclusion:

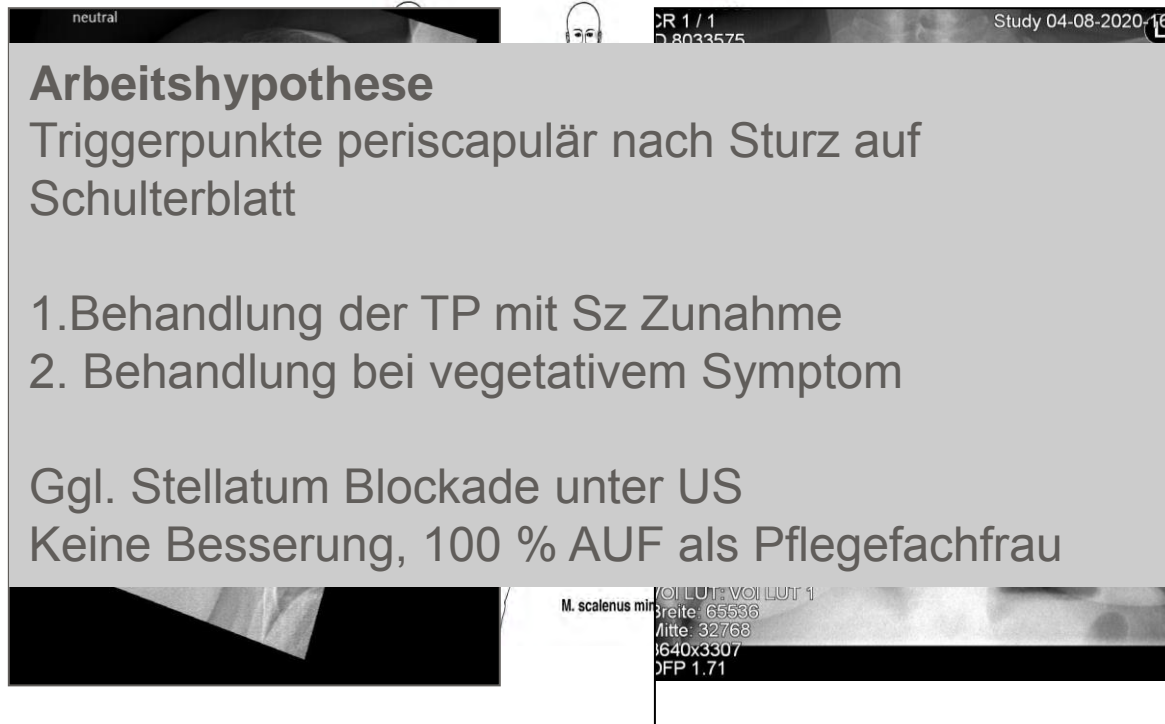
Both the active and passive interventions reduced arm and neck pain faster than the wait-and-see strategy

At 6 months, pain and disability had almost resolved for all the patients

Modifiziert nach
C.Reich



Frau W., 58 j. überwiesen von Schulterchirurgie zur Behandlung von myofascialen Triggerpunkten



neutral

R 1 / 1
78033575

Study 04-08-2020-16

Arbeitshypothese


Triggerpunkte periscapulär nach Sturz auf Schulterblatt

1. Behandlung der TP mit Sz Zunahme
2. Behandlung bei vegetativem Symptom

Ggl. Stellatum Blockade unter US
Keine Besserung, 100 % AUF als Pflegefachfrau

M. scalenus mir

TOI LUT: VOI LUT 1
breite: 65536
Mitte: 32768
1640x3307
DFP 1.71



Clinical Reasoning

What the heck ...?



orteste negativ
g Test negativ
e HWS
ogie/Nerven-
gsteste nicht
eführt
rzhafte
n periskapulär
tionelle
Umgebung nicht
weiterführend

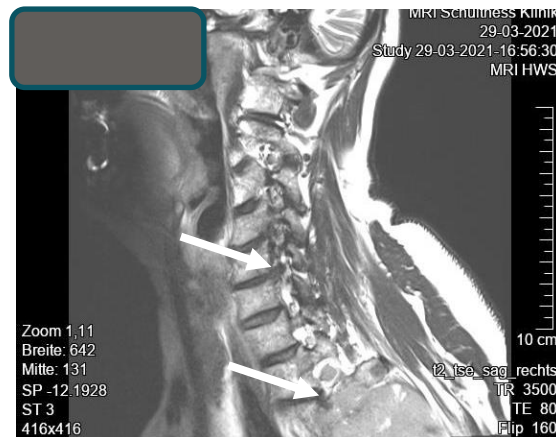
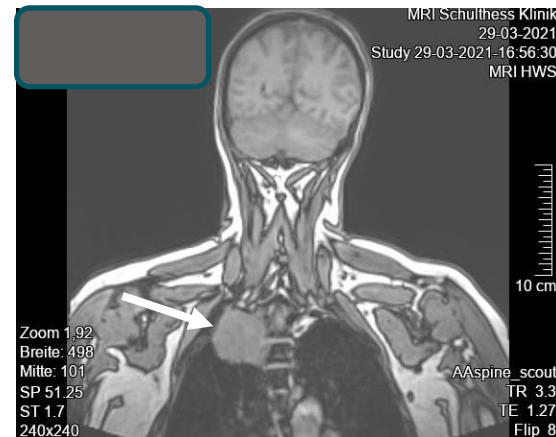
Auflösung

- Pancoast Tumor mit Infiltration von BWK 1 bis 3
- Adenocarcinom
- Debriefing
- Kein Neutrophilenanstieg
- Negativer PET
- Trotzdem



Louis Pasteur

HWS

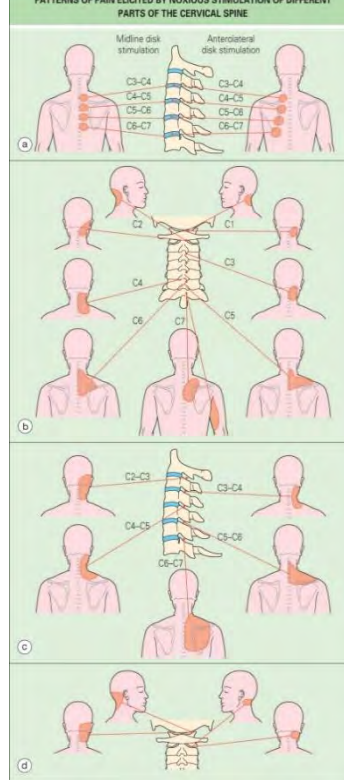


C2–C7

«Irritationszonen»

Palpation über Fazettengelenken und Provokation





Neck pain
Barnsley, Les, Rheumatology, 80, 621-631

Red represents the site stimulated to produce the pain pattern represented by the shaded area. (a) Intervertebral disks. The disks were probed in the midline anteriorly and lateral to the midline anteriorly. (b) Deep musculoligamentous tissue. The...

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Zur Therapie

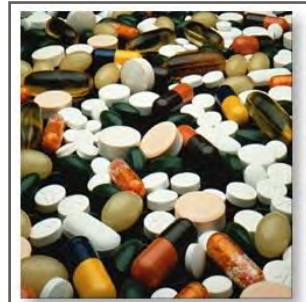
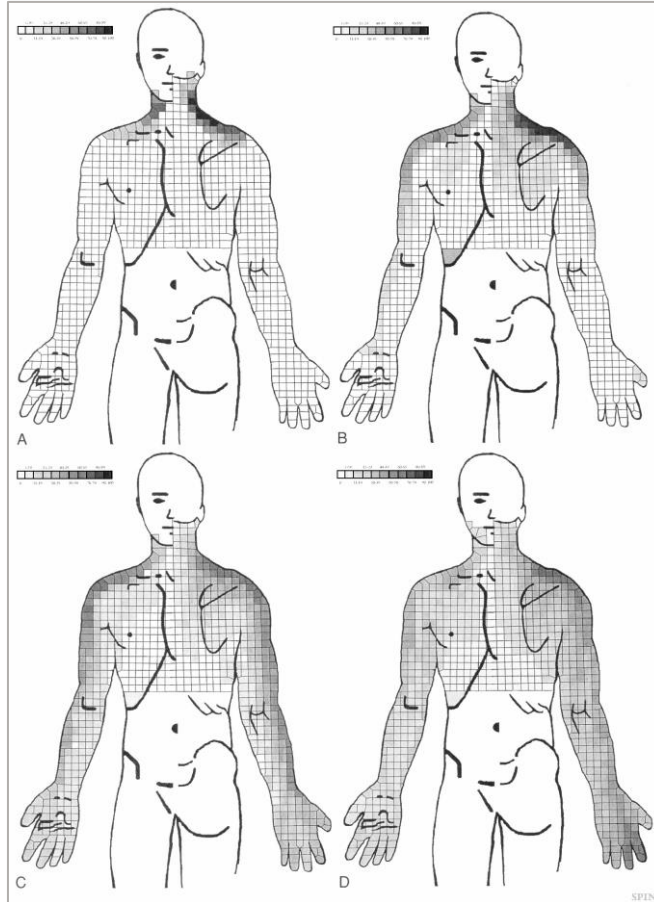


Figure 4



[Symptom Provocation of Fluoroscopically Guided Cervical Nerve Root Stimulation: Are Dynatome Maps Identical to Dermatome Maps?](#)

Slipman, Curtis W.; Plastaras, Christopher T.; Palmitier, Randal A.; Huston, Christopher W.; Sterenfeld, Elliot B.

Spine23(20):2235-2242, October 15, 1998.

doi:

Percent occurrence of symptom provocation per bit for the C4 to C7 roots. A, C4 dynatome; B, C5 dynatome; C, C6 dynatome; D, C7 dynatome.