

Sensory cortex



Thalamus



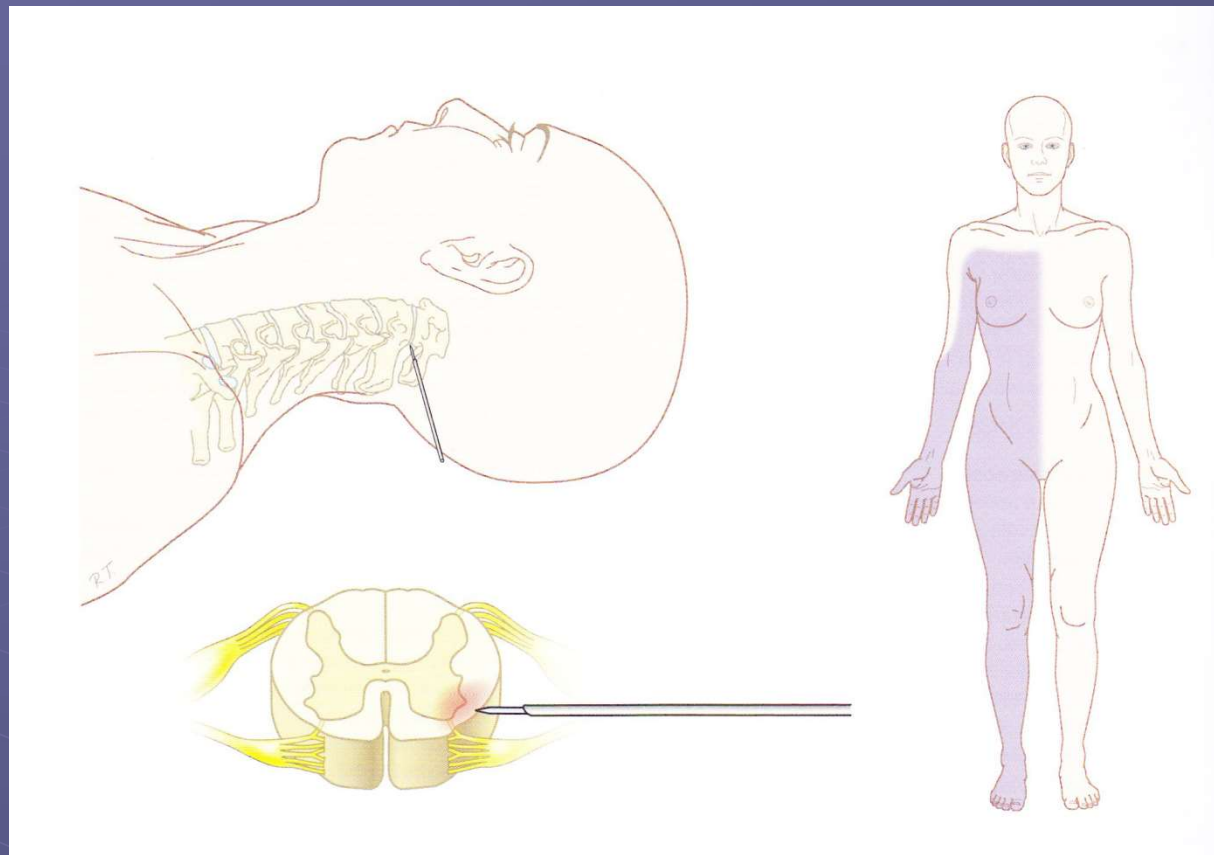
Climbing pathway:
spinothalamic tract



Dorsal horn
Spinal cord



Nociceptor



Onderbreken van de tractus spinothalamicus anterior

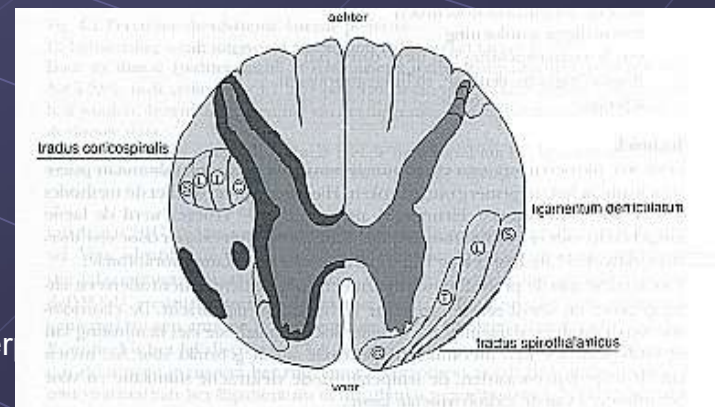
Thv niveau C1 C2

Grootste intervertebrale opening

Arteria vertebralis anterior tov merg

Geen facet

invasieve behandelingen bij kanker
M'tricht



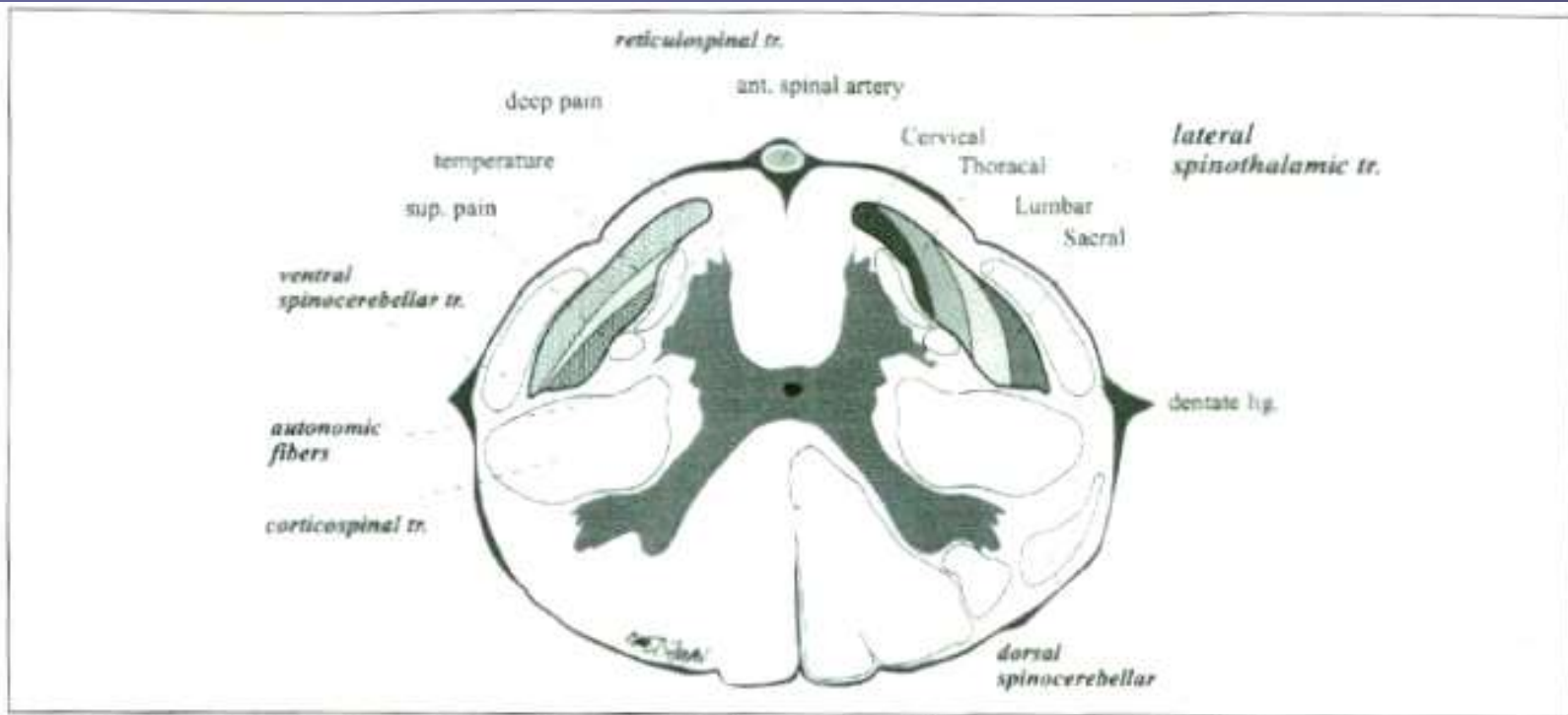


Figure 1: Schematic representation of target (lateral spinothalamic tract) and its environs at the C1-C2 level.

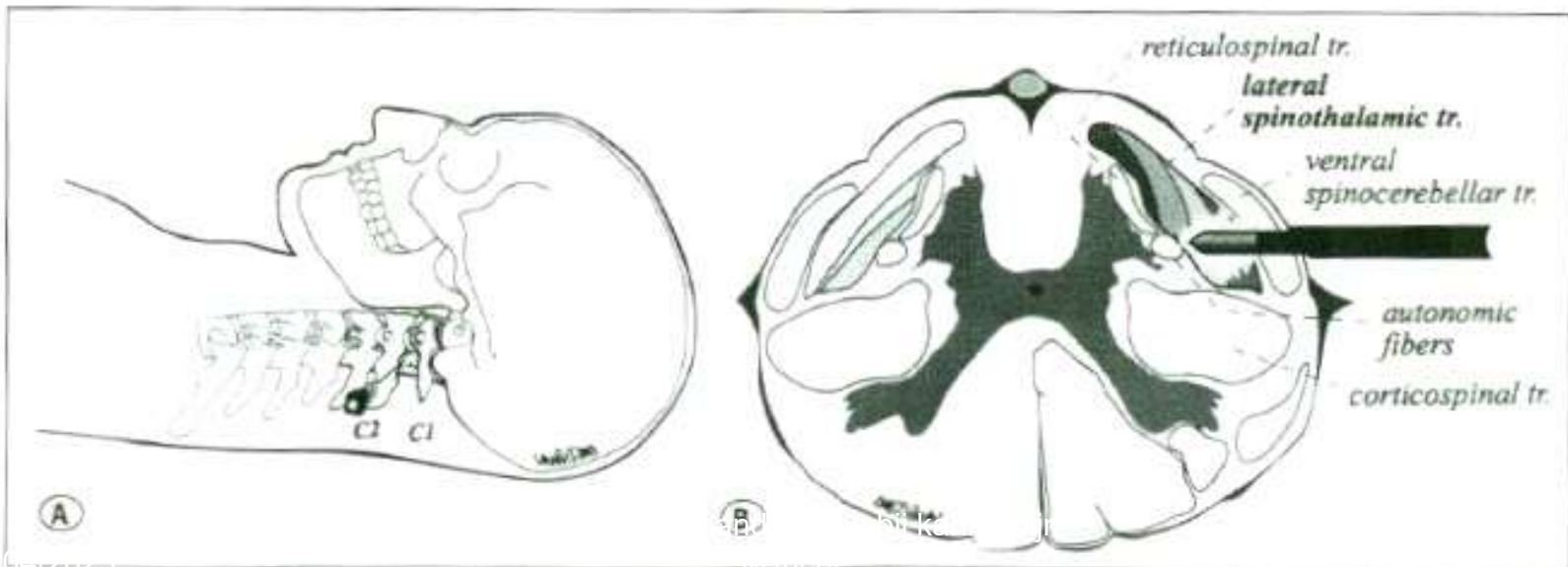


Figure 2: Schematic representation of lateral percutaneous cordotomy at the C1-C2 level. (A) Position of the needle at the C1-C2 level

Geschiedenis

1905	open cordotomy, midthoracic	Spiller & Martin
1932	open cervical	Forster & Gagle
1963	perc. strontium needle	Mullan
1965	RF electrode	Rosomoff
1969	stereotactic	Crue, Hitchcock
1989	CT guided	Kanpolat
2010	endoscopic guided	Fonoff

Cordotomy: literature

ARTICLE | May 18, 1912

THE TREATMENT OF PERSISTENT PAIN OF ORGANIC ORIGIN IN THE LOWER PART OF THE BODY BY DIVISION OF THE ANTEROLATERAL COLUMN OF THE SPINAL CORD

WILLIAM G. SPILLER, M.D.; EDWARD MARTIN, M.D.

JAMA. 1912;LVIII(20):1489-1490. d

Percutaneous, intramedullary cordotomy utilizing the unipolar anodal electrolytic lesion.

S S Mullan, J J Hekmatpanah, G G Dobben and F F Beckman
J Neurosurg 22(6):548-53 (1965) PMID 5213608

Enkele klinische voorbeelden

- Thoracale wand invasie door mesothelioma long
- Invasie plexus brachialis-long top tumor
Pancoast syndroom
- Invasie plexus lumbo-sacralis met unilaterale
beenpijn
- Geïsoleerde metastase vanuit de nervus
ischiadicus

Percutane Chordotomie

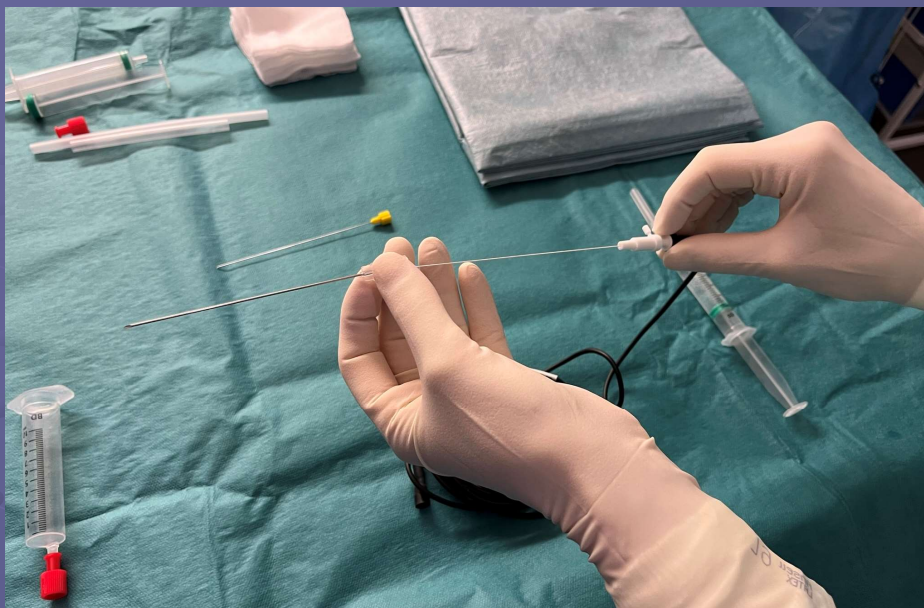
indicaties

- Unilaterale pijn
- lager dan dermatoom C5
- patiënt met beperkte levensverwachting
± 6 maanden
- redelijke respiratoire functie

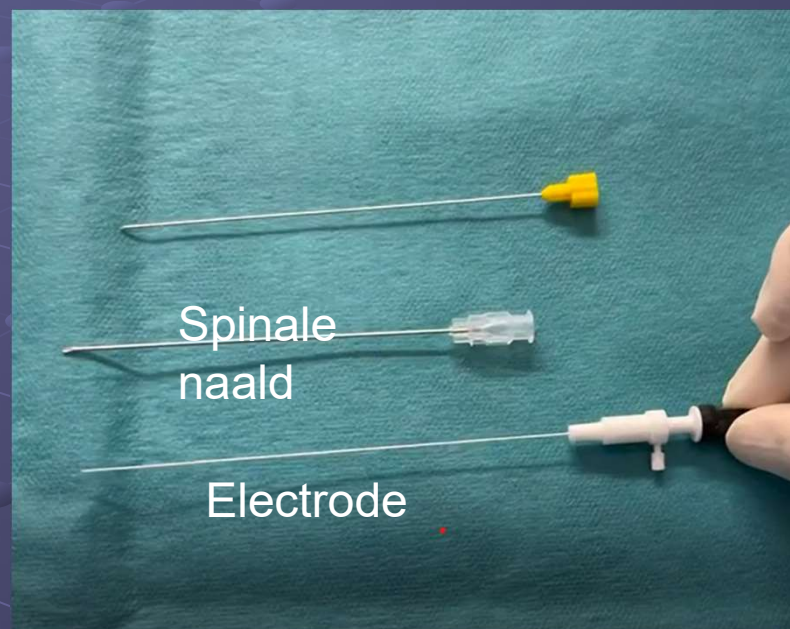
Percutane Chordotomie

- patiënt in rugligging met hoofd gefixeerd
- Onder röntgen begeleiding
- spinale punctie tussen C1 en C2
- positie van lig. Dentatum identificeren door contrast subarachnoidaal te spuiten





Minta probe



Spinale
naald

Electrode



Lipiodol



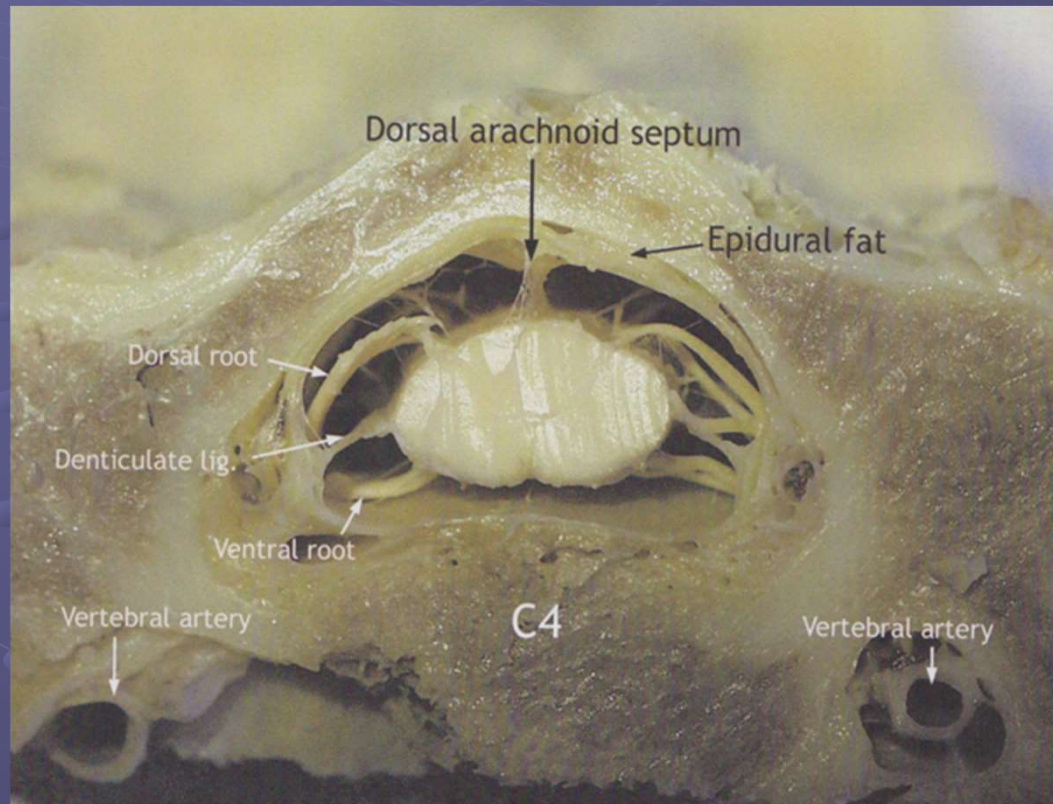
invasieve behandelingen bij kankerpijn
M'tricht

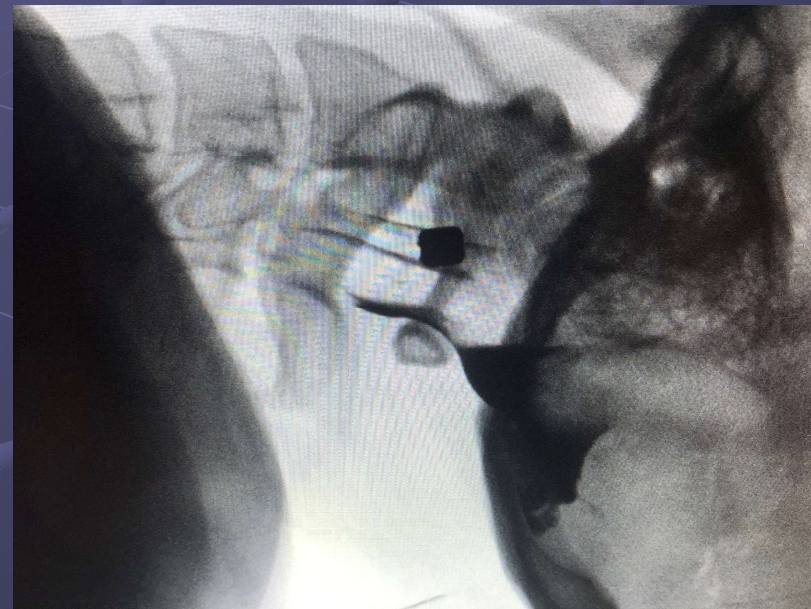


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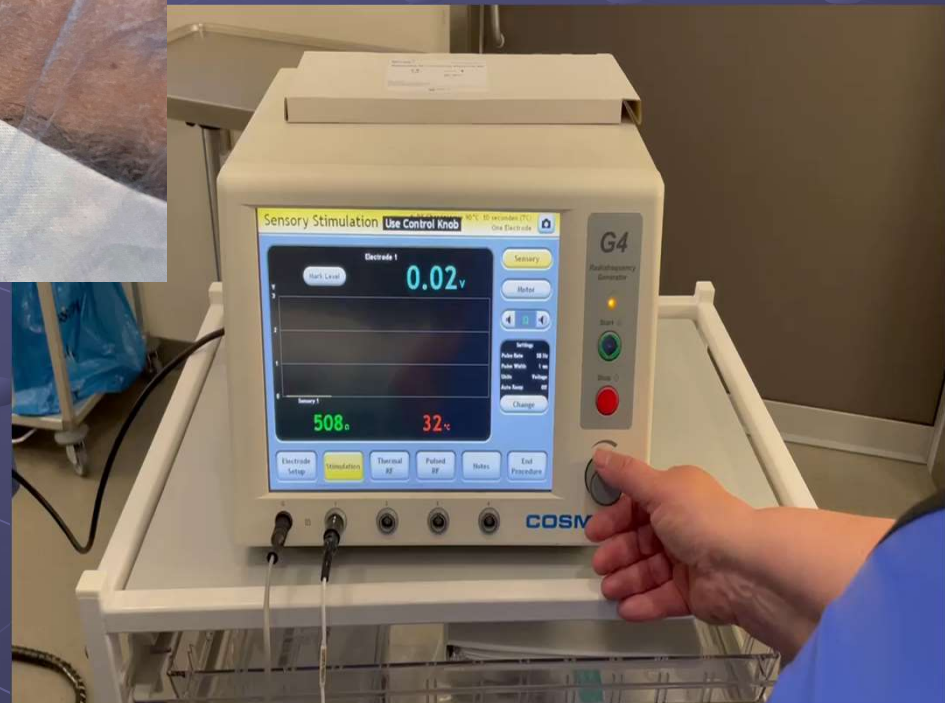
Ligamentum dentatum





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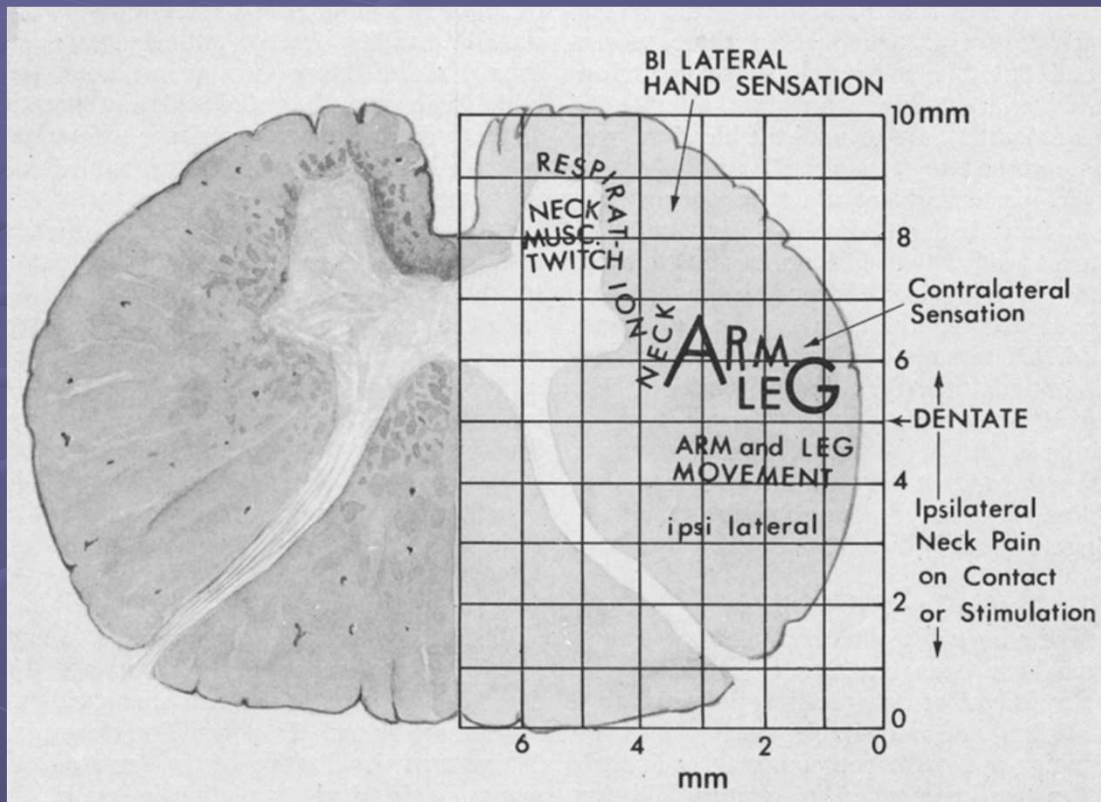


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invasieve behandelingen bij kankerpijn
M'tricht

Procedure Controle positionering electrode

1. Radioscopie : lateraal + AP -view
2. Impedantie stijging : 150 –300 →800-1000 Ohm
CSV naar ruggenmerg
3. Sensorisch elektrische stimulatie : 50 Hz
Stimulation at the region from the pain (<0,1V)
warmte, wind feeling, koude, paresthesia
Repositionering op geleide van functioneel schema
4. Motorische stimulatie



Motor stimulation parameters

Location of the electrode	Results of stimulation	
	At 50 Hz	At 2 Hz
Spinothalamic tract	Contralateral thermic stimulation below 0.4 V	No motor stimulation below 1 V
Corticospinal tract	Ipsilateral paresthesias and tetanization below neck	Ipsilateral motor stimulation below neck at less than 1 V
Anterior horn	Ipsilateral paresthesias and tetanization in neck	Ipsilateral motor stimulation in neck

4. Motor electrical stimulation

TABLE 53-1. Stimulation Parameters at C1-C2

Location of Electrode	Results of Stimulation	
	<i>At 50 Hz</i>	<i>At 2 Hz</i>
Spinothalamic tract	Contralateral thermic stimulation below 0.4 volts	No motor stimulation below 1 volt
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Anterior horn	Ipsilateral paresthesias and tetanization in neck	Ipsilateral motor stimulation in neck

- behandeling :
 - 10 s op 85 - 90 °
- Controle met pin prick, voor contralaterale analgesie
- Controle van de kracht in armen en benen
- Herhaal de procedure
- Tot 3x



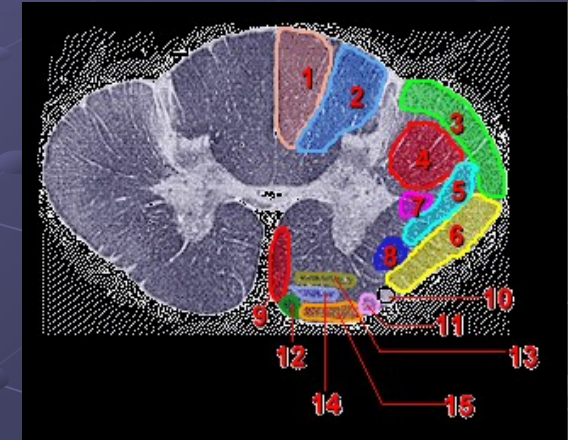
Percutaneous Cordotomy : side effects

- Hoofdpijn :
 - Cerebrospinaal vocht (CSV) lek
 - Mixen van CSV met bloed
 - Chemische meningitis door contrast
 - Transiente neuritis C2
- koorts : ware infectie/chemische meningitis

Percutane Chordotomie :

complicaties

- respiratoire dysfunctie
- slaap apnoe
- hemiparese - meestal tijdelijk
- blaas dysfunctie (7)
- Syndroom van Horner
- arteriale hypotensie in 40% - tijdelijk



Cervicale chordotomie

● Evidence 2C+

Case :

- 72 j dame
- Gemetastaseerd borstCa met ingroei in de plexus
- Forse pijn in de arm waardoor disuse
- NRS 8
- Interfereert in haar dagelijks leven
- Methadon, morfinepleister : ellendig : zelf 'troep' gestopt
- Verwezen voor oncoloog

- Vlotte procedure
- 1 nacht opname : geen nevenwerkingen
- Telefonische raadpleging : zeer tevreden, geen pijn meer

discussie

- Resultaten zijn **case series** (low level of evidence in GRADE system C+)
- Outcome van de case series zijn consistent
- Indrukwekkende reductie van pijn
- Relatief weinig nevenwerkingen cfr de pathologie
- Beperkt aantal centra in palliative care
- Regionaal refereer systeem
- Studieopzet België/Nederland : chordo

results PCC since 1990

1991	Jackson	83%	of patients less opioids, 38% free of opioids.
1993	Stuart	89%	satisfied
1995	Sanders	87%	satisfied
1999	Jackson	83 %	improvement of pain
2005	Crul	95%	NRS<3 , eol 69%
2005	Slavik	79-72%	total pain relief
2006	Antrobus	82%	complete pain relief
2013	Bain	61%	NRS 0 at 28 days
2013	Kanpolat	98%	pain NRS from 8 to 0

Met dank aan Dr Paul Zomers

19/04/2023

invasieve behandelingen bij kankerpijn
M'tricht

Study PCC Franciscus Hospital

- 2006-2013
- prospective data registration
- all 69 consecutive patients, ITT
- case serie
- 1 doctor

Inclusion

- Malignancies, 66% lung/mesothelioma
33% other
- Pain location 63% upper quadrant
37% lower quadrant
- Sex 66% male
34% female
- NRS max pre 9-10 with optimal treatment

Procedure

- easy and fast

63 %

- difficult > 2 needle entries

30 %

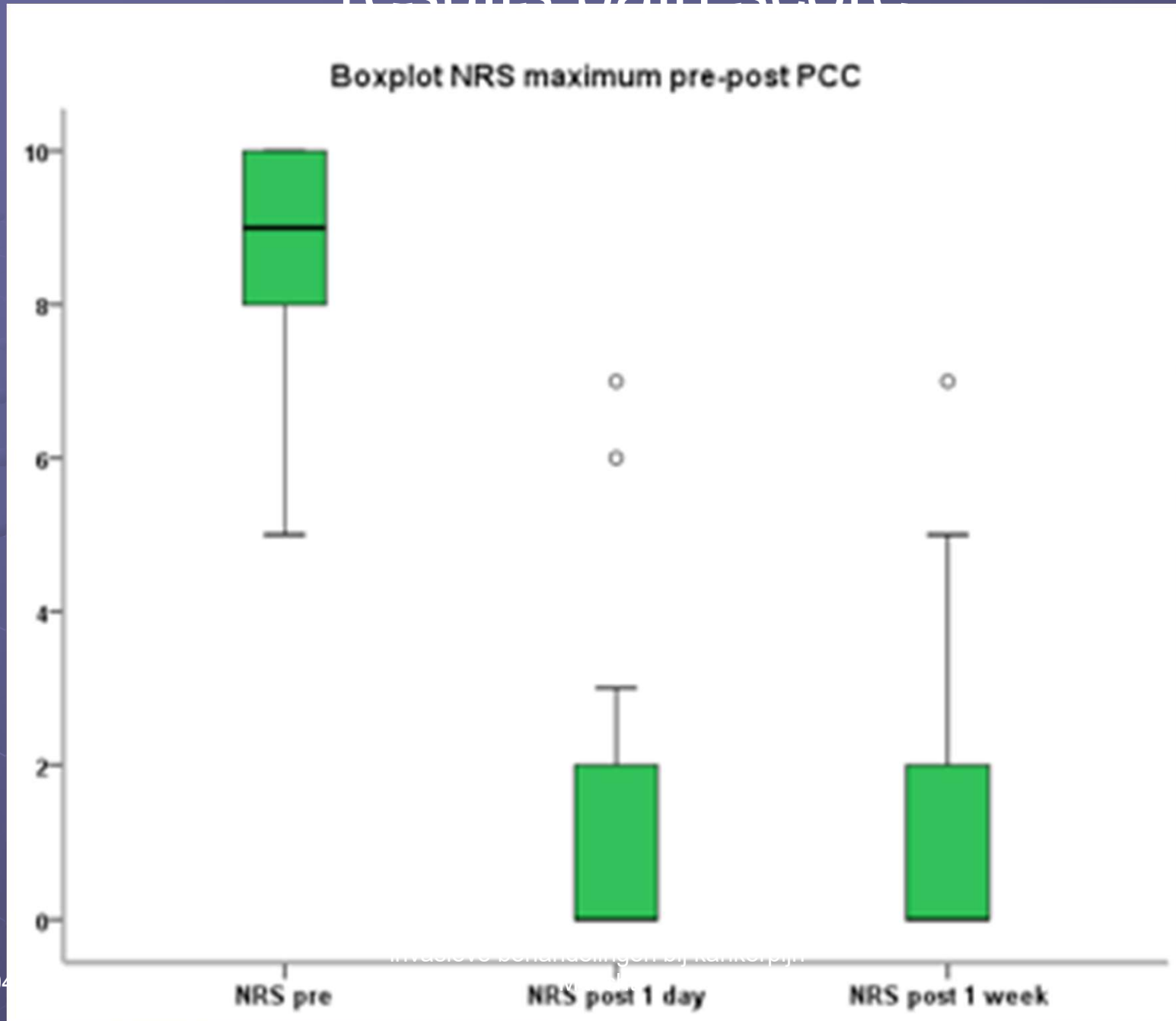
- unsuccessful no RF 1st session

7 %

- days till death
(mean 80)

4-640

results pain score



Side effects and complications study (%)

● Urinary catheter > 1 week	9
● Dysesthesia pain side	6
● Muscle weakness > 1 week	8
● Muscle weakness > CMR 4	0
● Mirror pain	0-3?
● Hemiparesis	0
● Respiratory insufficiency	0