

Rygkirurgi

- indikationer
- effekt
- risici

JØRGEN DEGN

Hot Topics 2024 – Hotel Svendborg



KATHINKA LINDHE

SIXTEN
& ELVIRA

"Man kan blive lam"

"Det er farligt og det hjælper ikke"

"Man kan dø af det"

"Man får flere smerter"

"Min tante endte i kørestol"

"Smerterne kommer alligevel igen"

"Patienten blev fejlopereret og på forkert indikation"

Degenerativ rygkirurgi

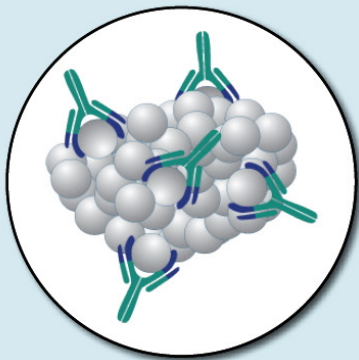
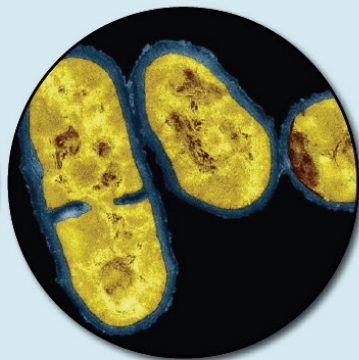
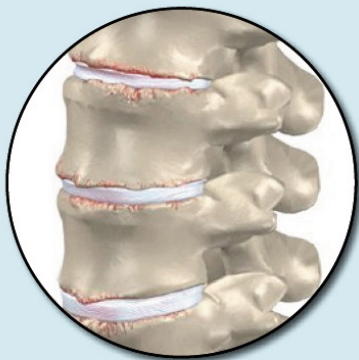
6:18 indgreb

- **ABC16: Mikrokirurgisk fjernelse af lumbal diskusprolaps (LP)**
- **ABC21: Forr.dekomp./col. cerv. m.indsæt./intervert. fiks.implant. (ACIF)**
- **ABC26:** Åben operation for lumbal diskusprolaps (LP)
- **ABC30:** Dekompression af cervikal nerverod (Fryckholm)
- **ABC36: Dekompression af lumbal nerverod (rodfrilægning)**
- **ABC40:** Dekompression af cauda equina (CES)
- **NAG40:** Forr. spondylodese m. int. fiks. i col. Cervialis (Providence-skinne)
- **NAG44: Forr. spondylodese m. int. fiks. i col. Lumbalis (Sustain, Synfix, Oracle)**
- **NAG46:** Forr. spondylodese m. int. fiks. i col. lumb-sacr. (Synfix)
- **ABC56: Dekompression af lumbal spinalkanal og nerverod (LSS)**
- **ABC60:** Dekompression af den cervikale rygmarv (CSS)
- **ABC63:** Dekompression af den torakale rygmarv
- **NAG64:** Bageste spondylodese u. fiksation i columna lumbalis (NID)
- **NAG66:** Bageste spondylodese u. fiksation i columna lumbosacralis (NID)
- **ABC66:** Dekompression af lumbale rygmarv (conus) (L1-LSS)
- **NAG70:** Bageste spondylodese m. fiksation i columna cervialis (Vertex)
- **NAG74: Bageste spondylodese m. fiksation i columna lumbalis (Solera)**
- **NAG76:** Bageste spondylodese m. fiksation i columna lumbosacralis (Solera)

Hvordan
opstår
"slidgigt" i
ryggen?







Multifaktoriel kumulativ model



Indikationer

NEUROANATOMI

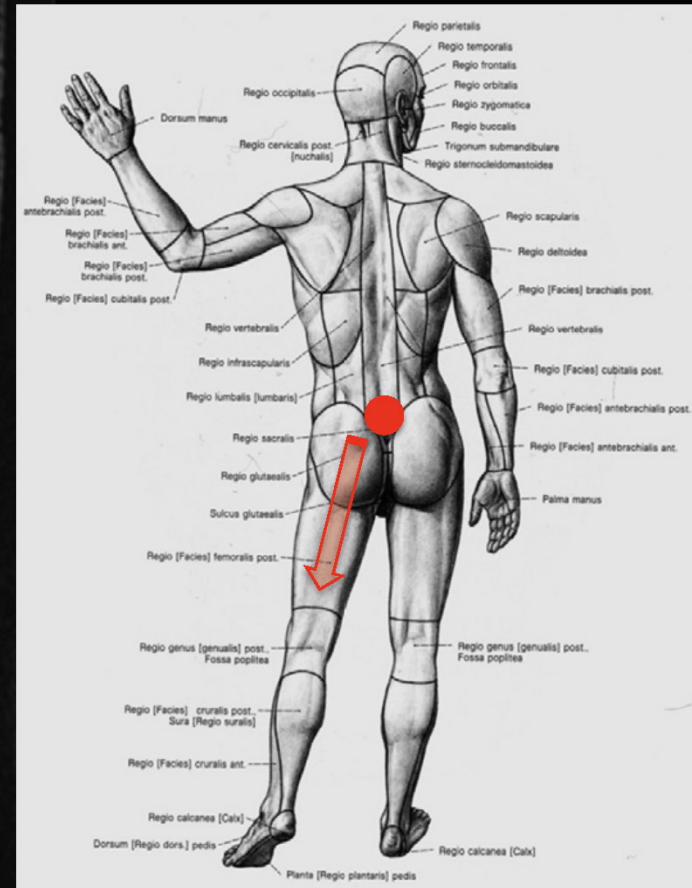
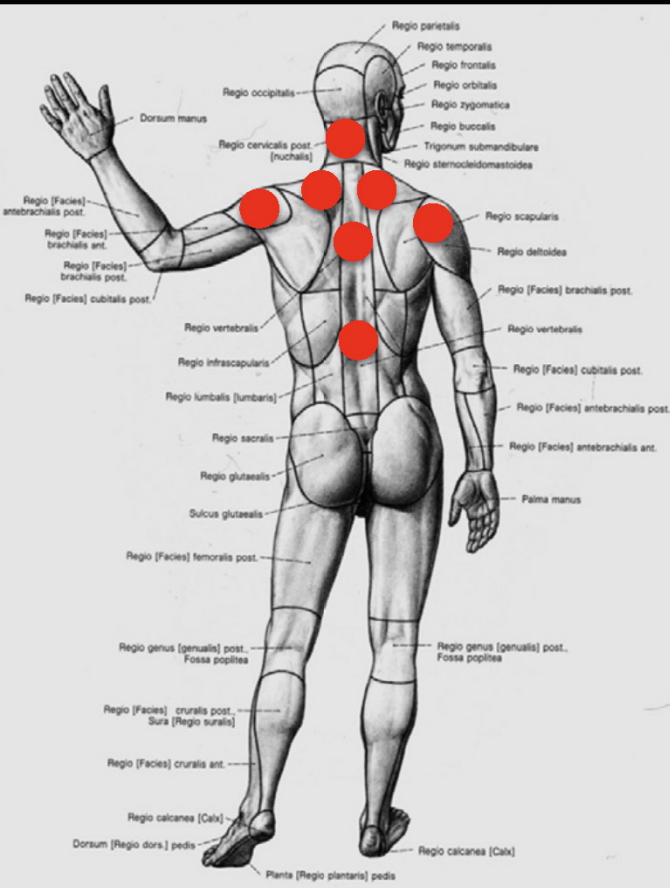
- Nerverod
- Cauda equina
- Rygmarven
- Columna

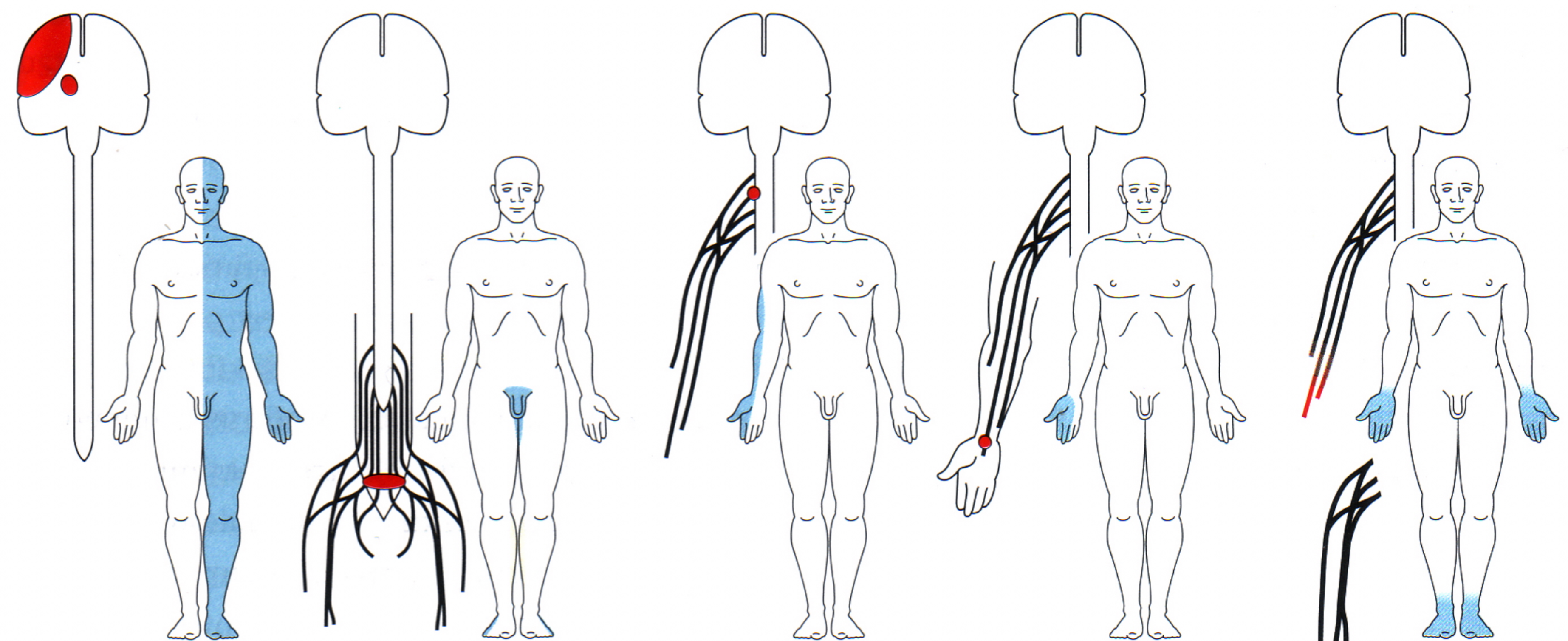
KLINIK

- Radikulopati
- Neurogen claudicatio
- Parese
- Cauda equina syndrom
- Myelopati
- Axiale smerter
- Instabilitet/deformitet

Hvilken smertegenerator?

Diskus? Facetledsartrose? Rodtryk? Myoser? Gigt?





Sensorisk cortex eller thalamus

(fx apopleksi) Modsidigt hemiformt føletab.
For sensorisk cortex desuden astereognose og sensorisk inattention.

Cauda equina syndrom

(fx sakrale nerverødder S1-S5 ved stor L5 prolaps)
Sensorisk tab i ridebukseområdet og S1-dermatomer.

Radikulopati

(fx 6. cervikale nerverod (ved cervikal diskusprolaps C5/6))
Sensibilitetstab i det pågældende dermatom.

Mononeuropati

(fx n. medianus ved carpaltunnelsyndrom)
Sensibilitetstab sv.t. den pågældende perifere nerve distalt for læsionsstedet.

Polyneuropati

Handske- og sokformet sensibilitetsudfald.

DEN KLINISKE DIAGNOSE

- Hvad fejler patienten?
- Hvad er smertegeneratoren?
- Hvor sidder læsionen i nervesystemet? Rod? Perifer nerve?
- Sygehistorien
- Den objektive (neurologiske) undersøgelse
- Signifikant radiologisk rodpåvirkning?

Introduction: Globally, low back pain is the *leading* cause of years lived with disability¹. Greater attention is needed to mitigate this increasing burden and the impact it is having on health and social systems. The pain experienced is composed of varying parts of organic and psycho-social components, however a *specific pathoanatomical pain generator* can only be detected in approximately 25% (see figure 1).

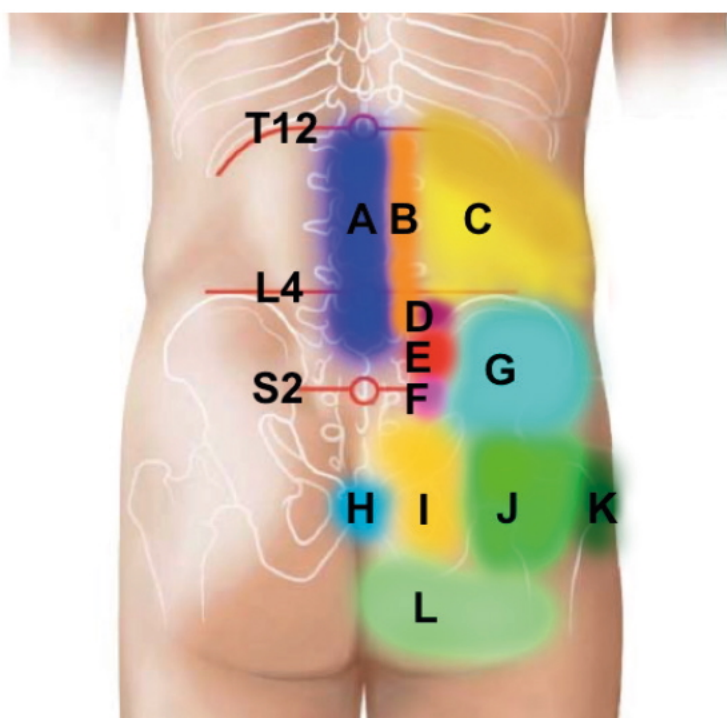


Figure 1: Lumbar pain zones seen with different generators: A) Axial (discs, vertebrae, facets, endplates, spinous processes — degenerative changes e.g. disc degeneration, -herniation, Modic changes, HIZ, Schmorl's node, spondylolisthesis, scoliosis and Scheuermann's disease. Also tumor, fracture, inflammation and infection). B) Paraspinal (secondary myofascial pain). C) Flank (muscles, referred pain from kidney/ureter, endometriosis). D) Fused transverse process (Bertolotti's syndrome). E) Spina Illiaca Posterior Superior (SIPS — Back Mouse Syndrome). F) Sacroiliac joint (dysfunction). G) Gluteal region (muscles, superior cluneal nerve, fibromyalgia). H) Coccygeal (coccydynia). I) Piriformis syndrome, middle cluneal nerve. J) Hip joint (coxarthrosis). K) Trochanter (bursitis). L) Inferior cluneal nerve.

AXIALE NAKKESMERTER

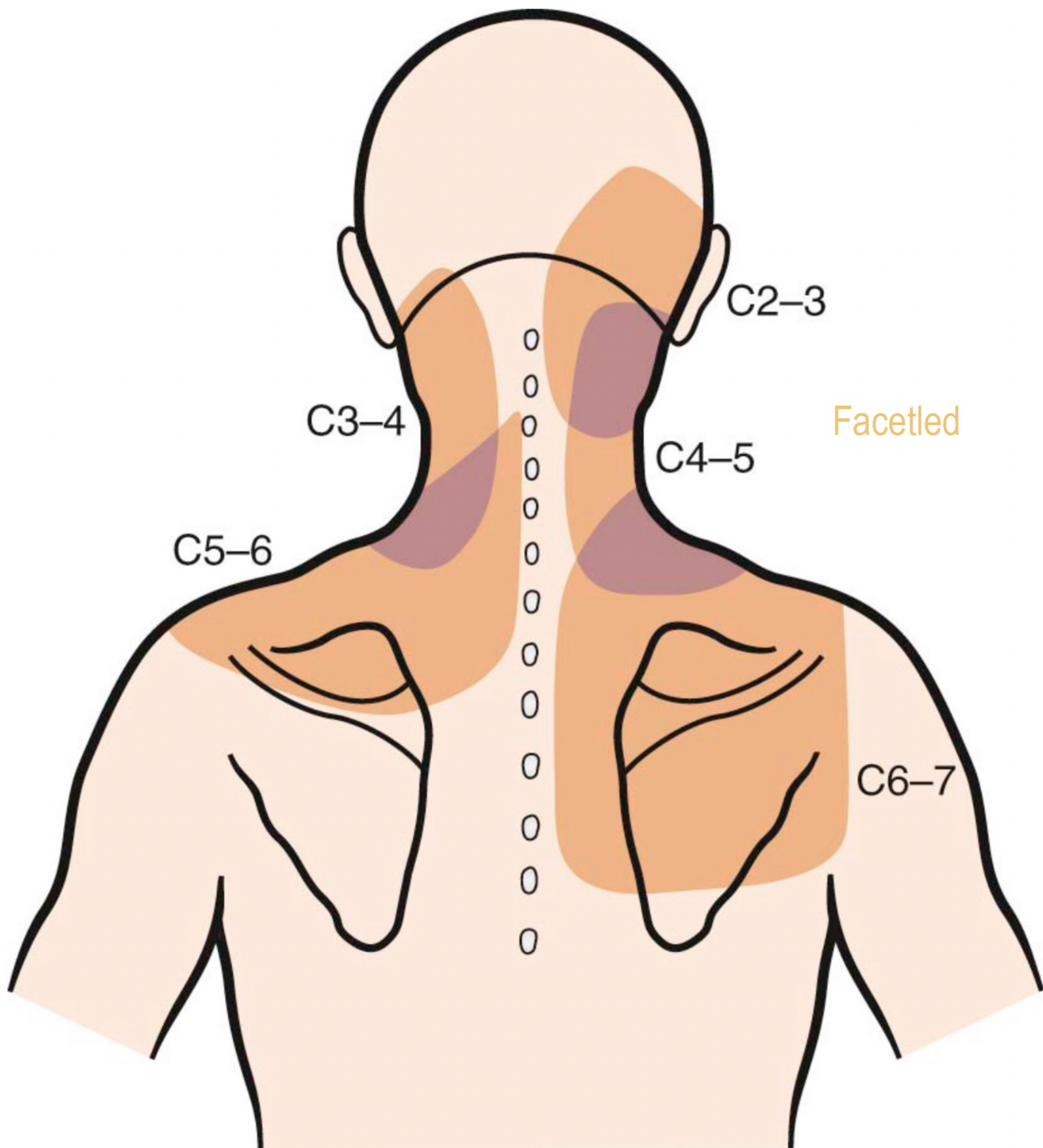
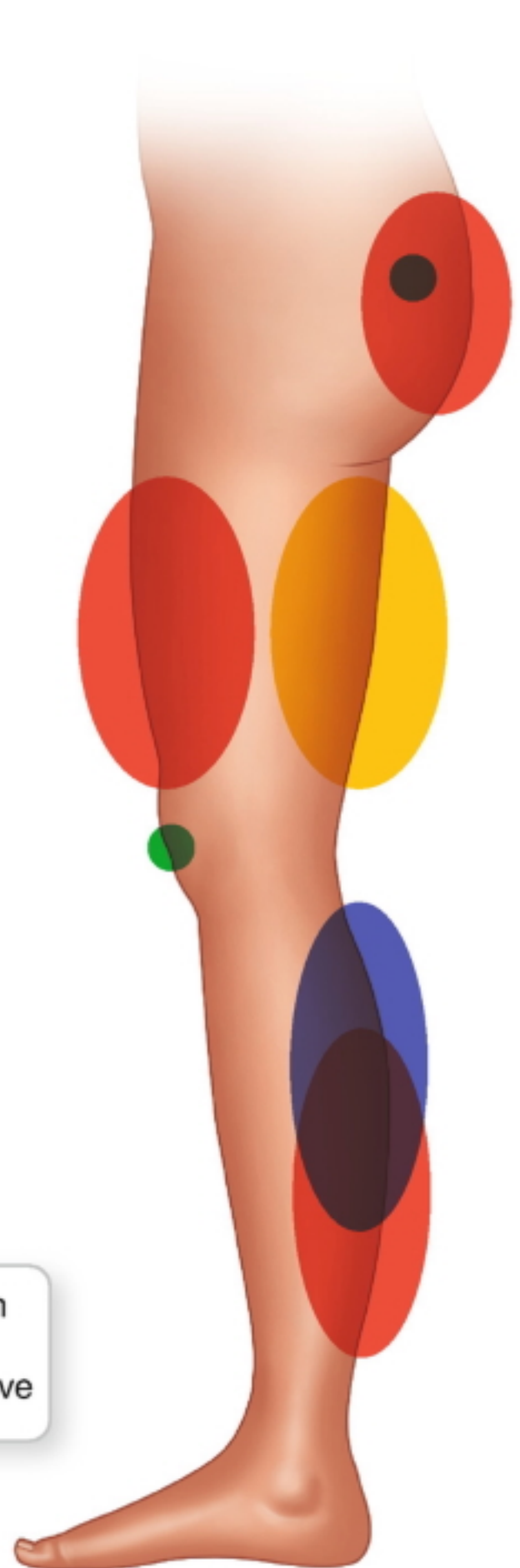
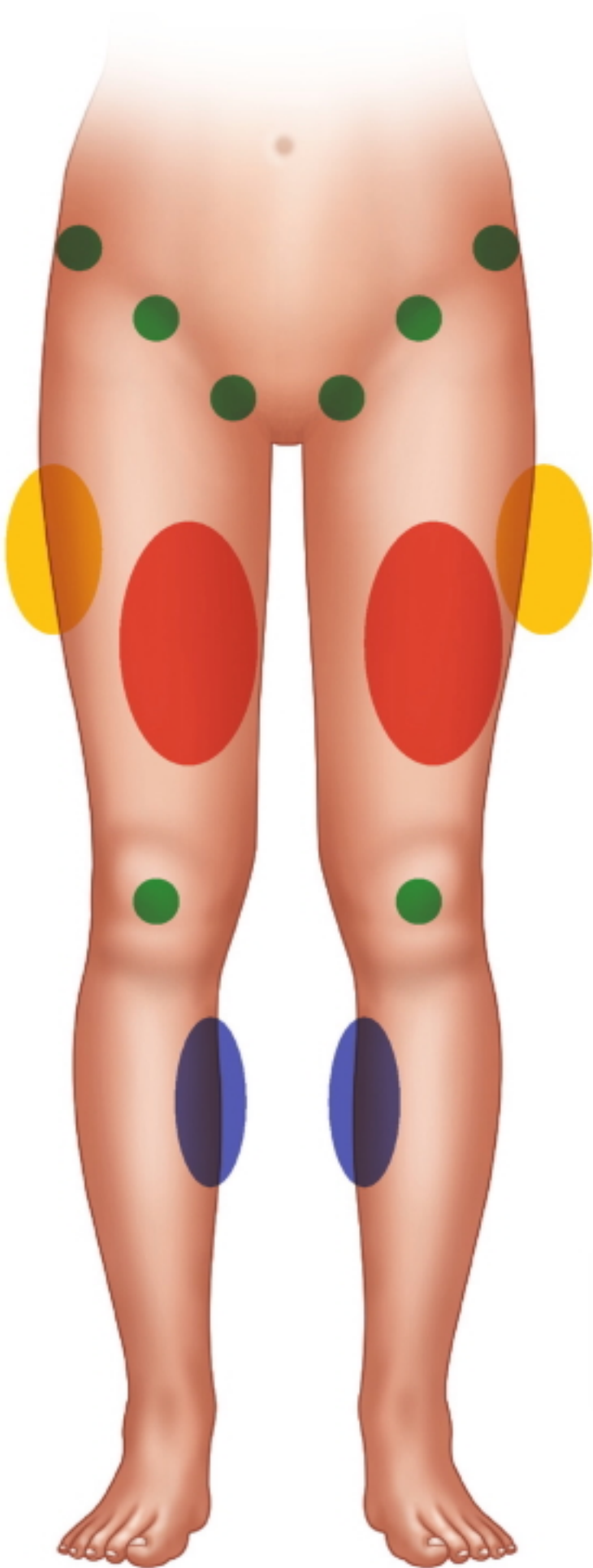


TABLE 2.1 Diagnoses of leg pain and associated features

Diagnosis	Location	Pain characteristic	Exercise	Rest	Position	Exam
Peripheral artery disease [1]	Any large muscles of leg and or buttocks e.g. calves and thighs	Heavy, tired, sometimes crampy Pain moves distal to proximal	Worsens	Often improves	Leg elevation can cause pallor, dependent position may cause rubor	Pulses may be decreased and ankle pressure may be less than arm pressure
Spinal stenosis [2]	Posterior leg, lateral thigh, bilateral buttocks	Pain moves proximal to distal with associated weakness Can be heavy and tired Numb and tingling	Sometimes worsens	Sitting or flexing the spine is required for relief	Upright	Normal pulses. Pain changes with lumbar flexion and extension
Nerve root compression [3]	Radiates down the leg	Sharp, stabbing pain	No reliable effect	No reliable effect	Improved when sitting or supine	Area of pain corresponds to specific nerve root
Venous claudication [4]	Calf, but can be entire leg	Tight, exploding pain	Worse with significant exertion	Decreases slowly	Not present at rest	Brawny skin, distended peripheral veins and venules
Baker’s cyst [5]	Behind knee and down calf	Tenderness, swelling is constant	Worse with exercise	Present at rest	None	Knee arthritis
Arthritis [6]	Joint primarily involved	Aching on waking	Worse with exercise	Slow relief	Can improve with rest	Pain moving joint

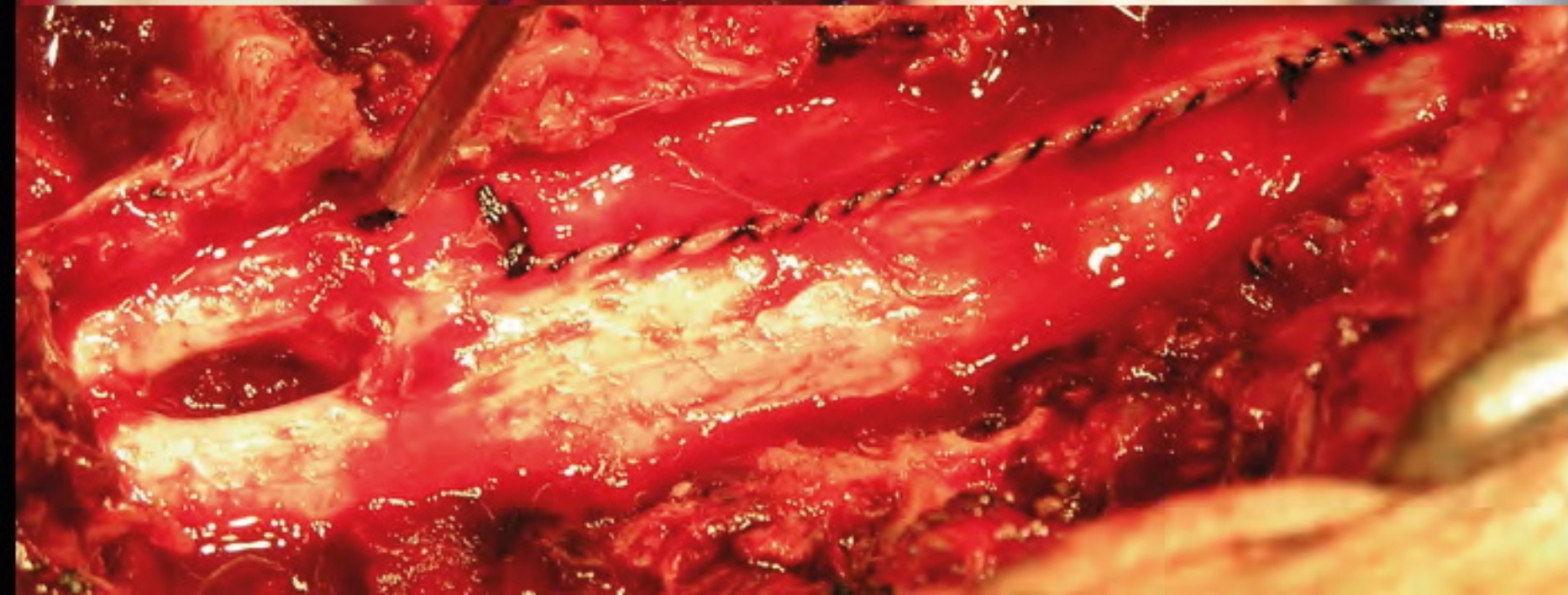
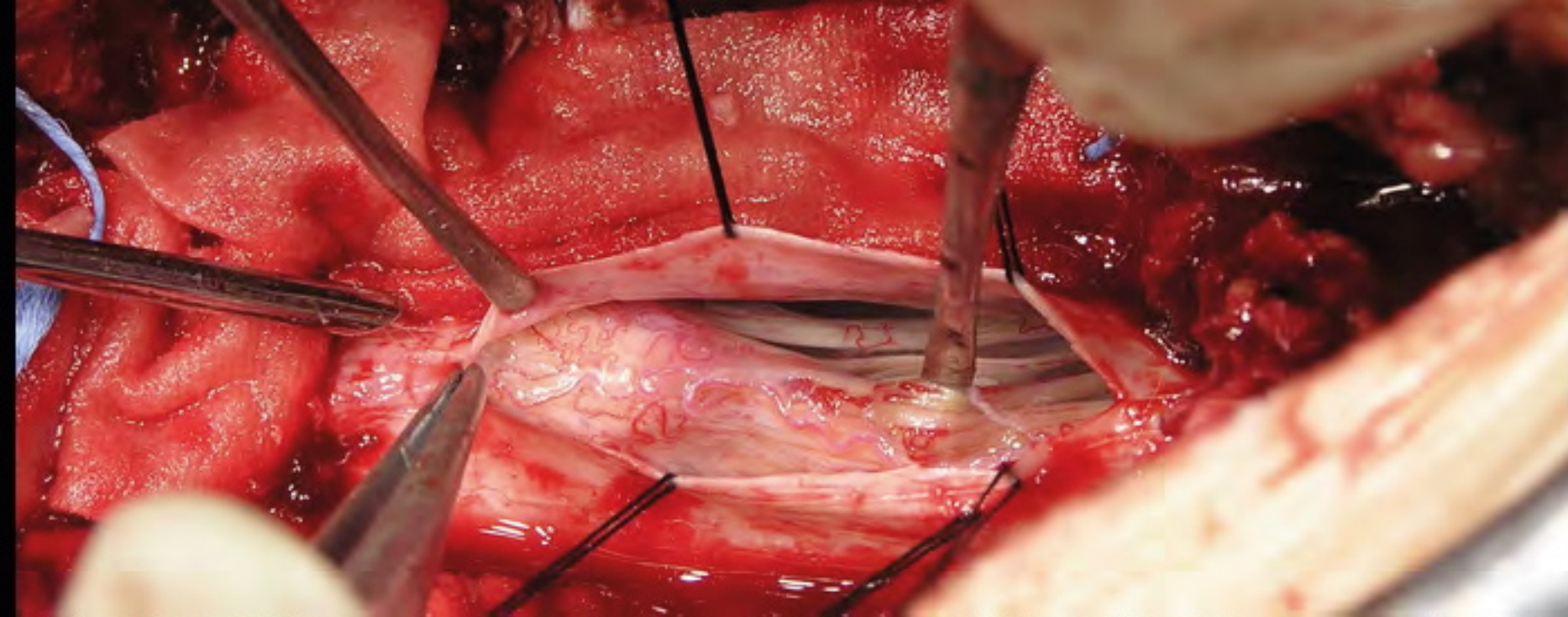


Monoradikulopati

- 20 rødder: C5, C6, C7, C8, L1, L2, L3, L4, L5, S1
- Betydelig, intermitterende smerteudstråling vellokaliseret svt. relevant dermatom (arm hhv. bensmerter, dog obs anatomisk variation)
- Manglende effekt af ca. 10 ugers konservativ behandling herunder optimal og relevant smertebehandling
- Fravær af kronisk neuropatisk komponent (2 år) og betydelig komorbiditet
- Smerteanamneses bekræftet ved MR og neurologisk undersøgelse (2. neuron, Spurling, Lasègue-Bragard), nerverodsbloade? Operationsønske
- Akut ved rodinkarceration hhv. svær parese. Subakut ved intraktable smerter.
- Årsager: prolaps, cyste, recesstenose, rodkanalsstenose.
- Udeluk: pseudoradikulopati, neuropati, PNS (ex. peroneus), hofte/knælidelse, arvæv
- Indgreb: 16, 21, 36, 44, 56, 64, 74.

Neurogen claudicatio

- Ved LSS evt. multiple niveauer (L1-L5)
- Vindueskiggersyndrom med nedsat gangdistance, lindring ved foroverbøjning.
- Akut ved CES/conustryk (40).
- Udeluk vaskulær komponent og (poly)neuropati (“strømper”), Simvastatin?, urgeinkontinens.
- Indgreb: 56 (64, 74).



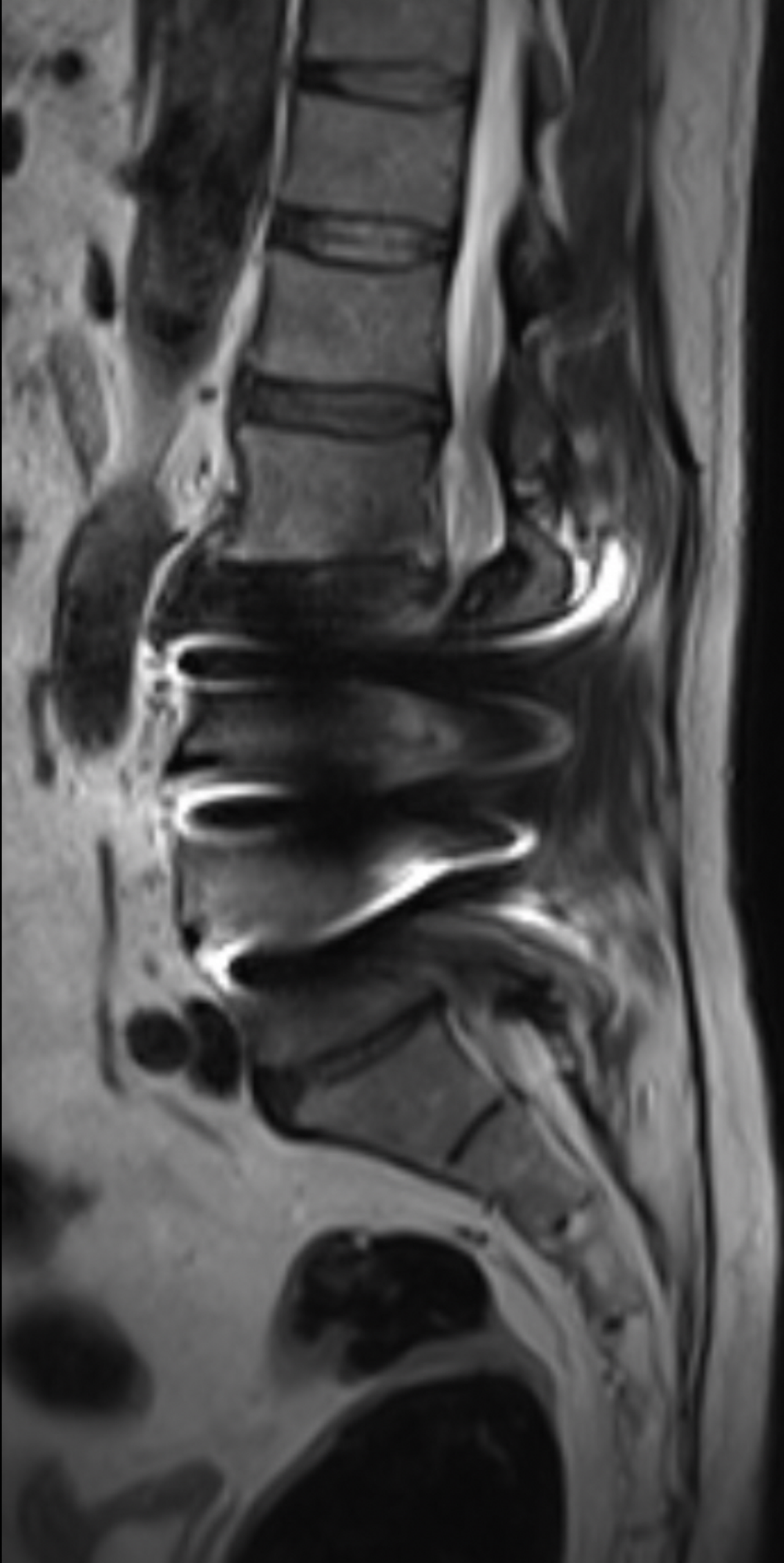
70-årig mand

- Lumbal dese L3-L5 i 1999
- Rygsmerter med udstråling til venstre ben
- Positiv strakt-ben-test
- Blæreskanning: 800 ml
- Svært nedsat perianal sensibilitet
- Ophørt voluntær sfinkterkontraktion
- Rimelig sfinktertonus
- Tidspunkt da du ser pt: 23:30

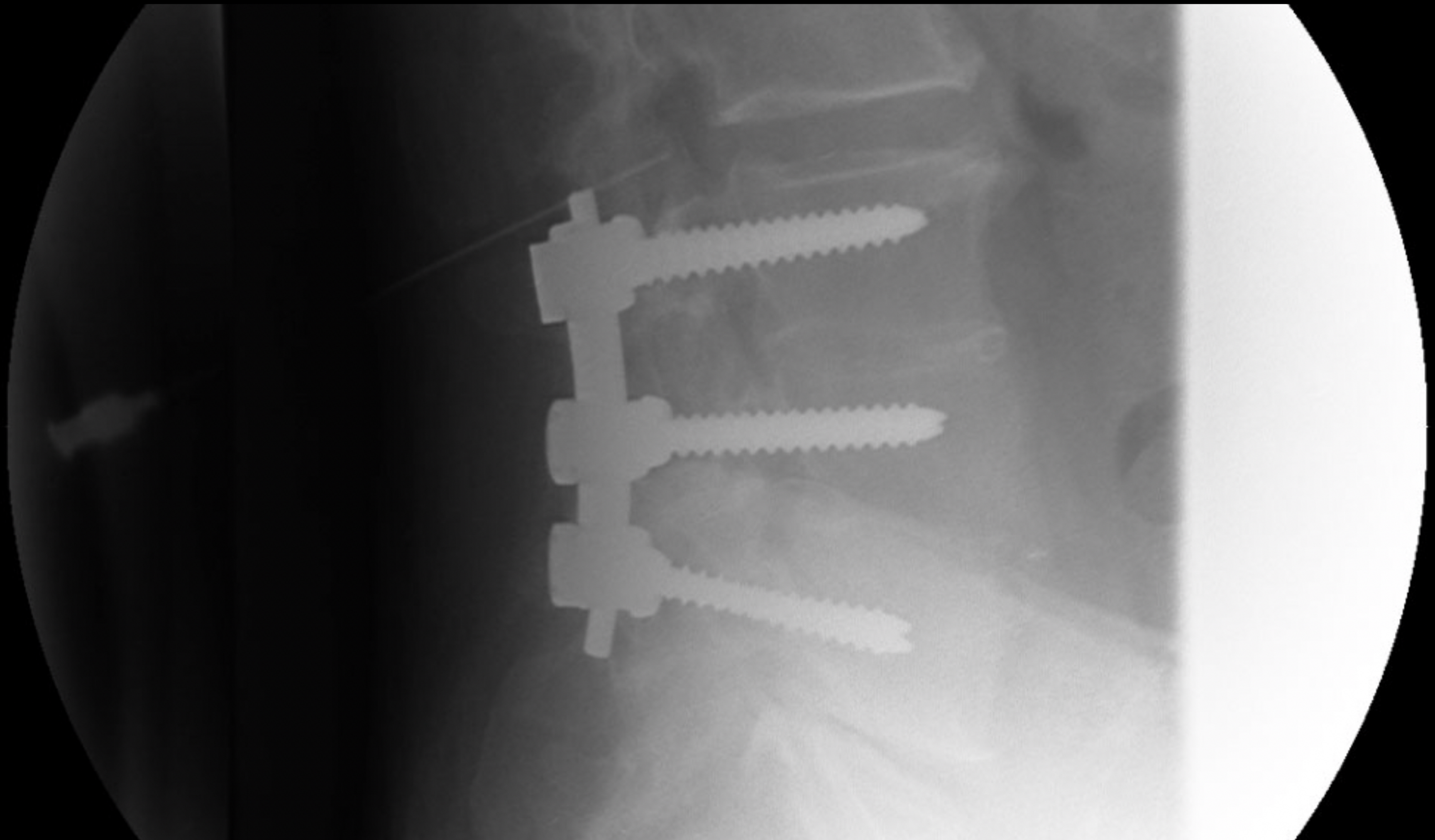
Diagnose?
Udredning?

CT-skanning

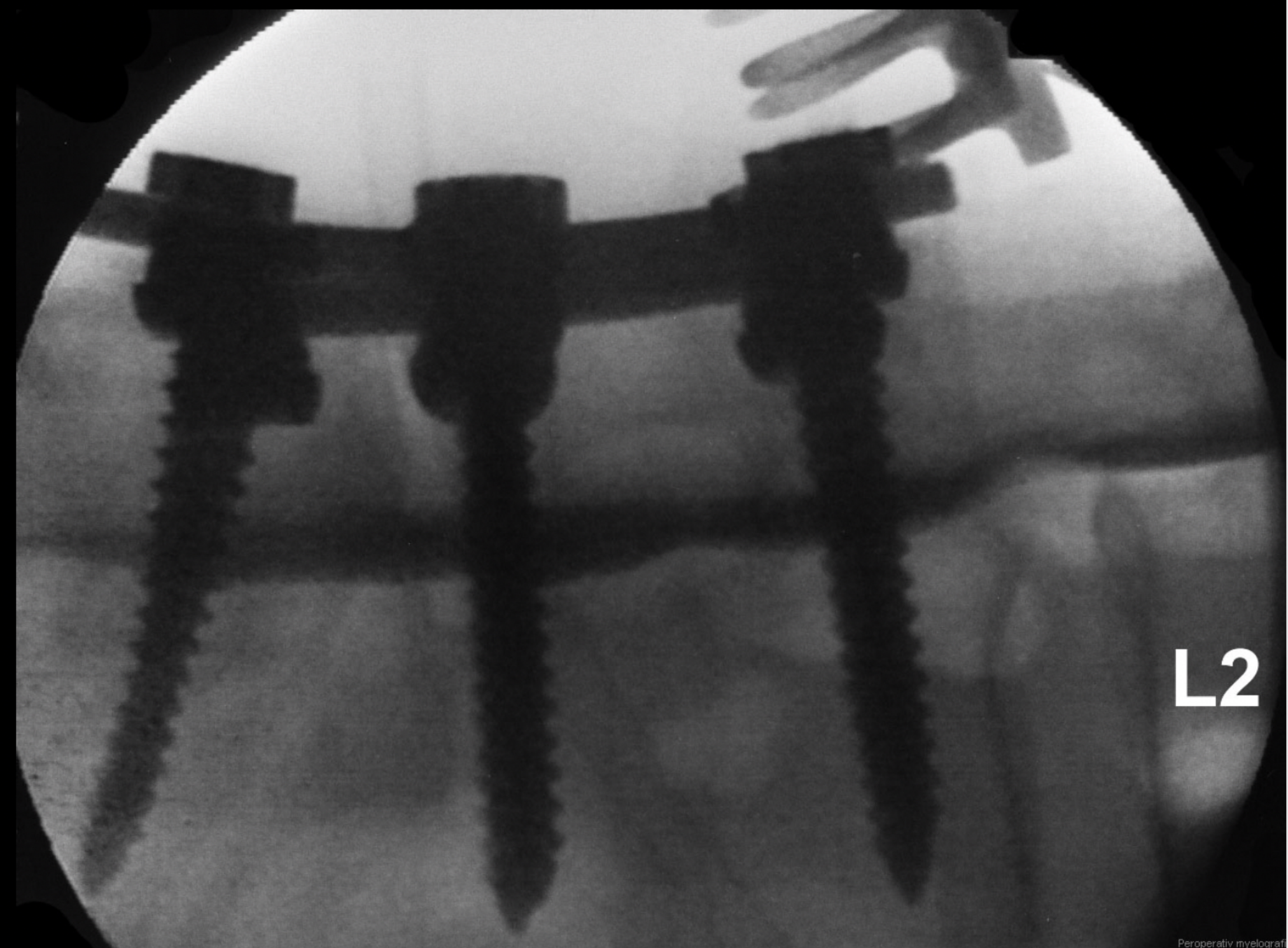
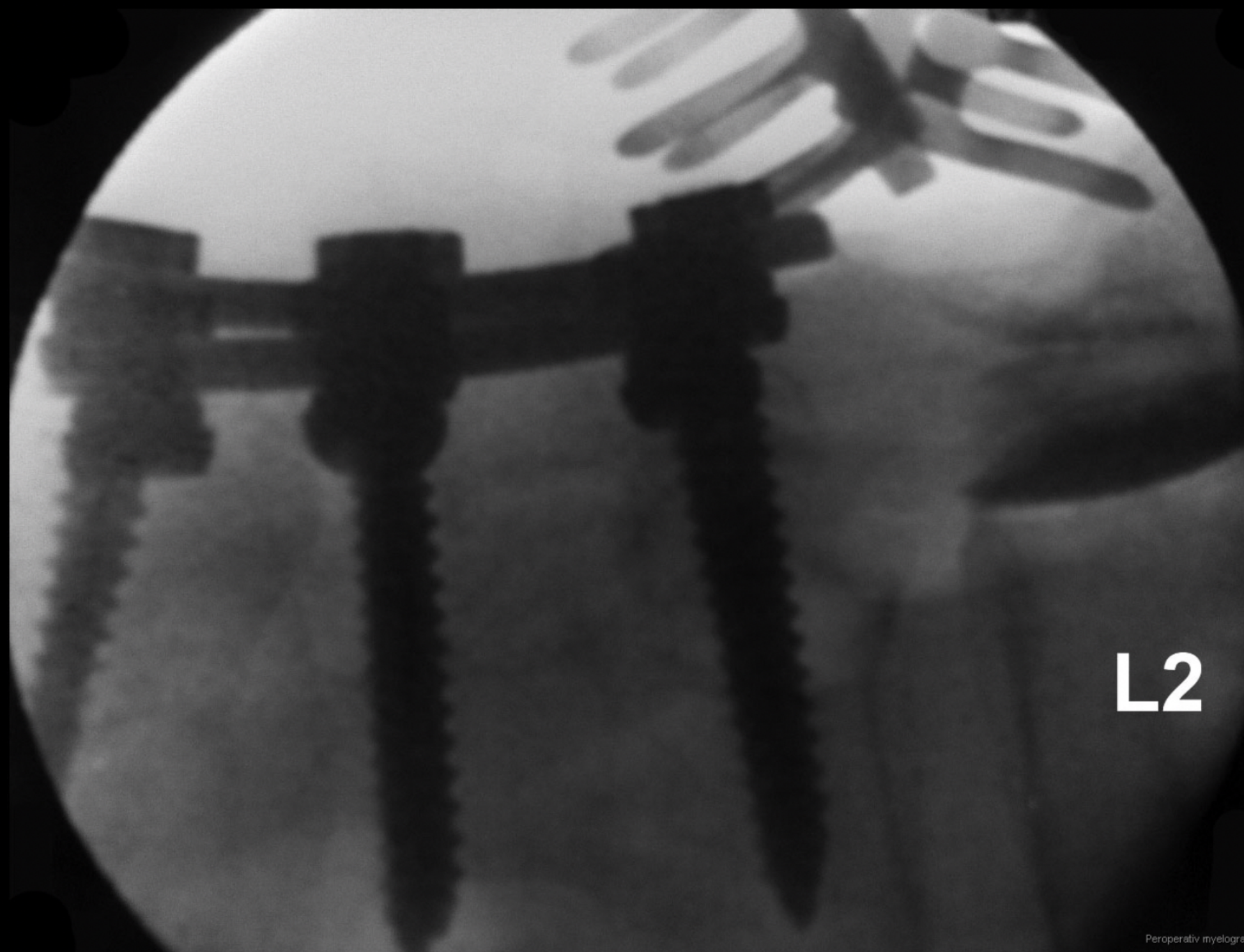


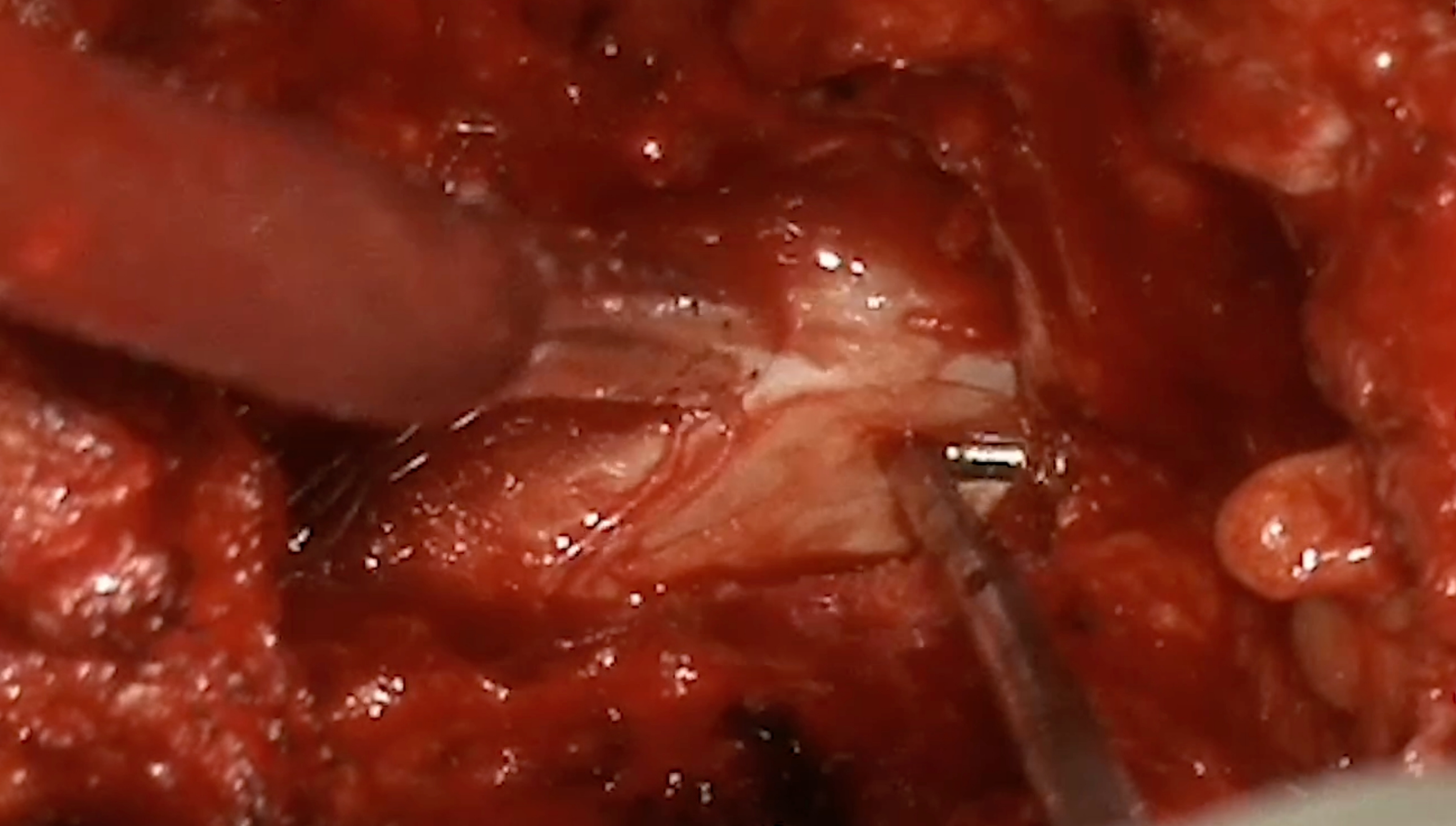


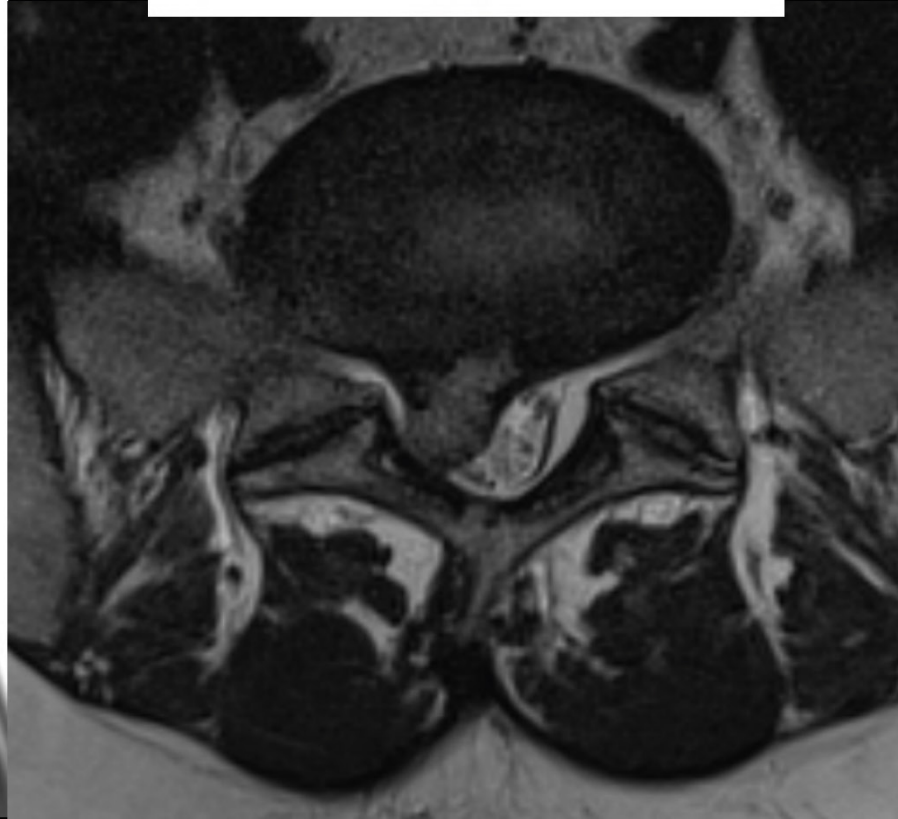
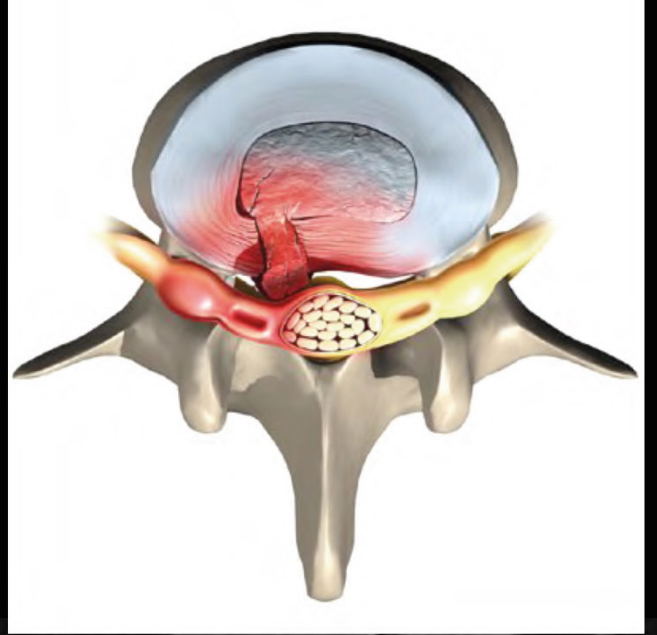
Myelografi



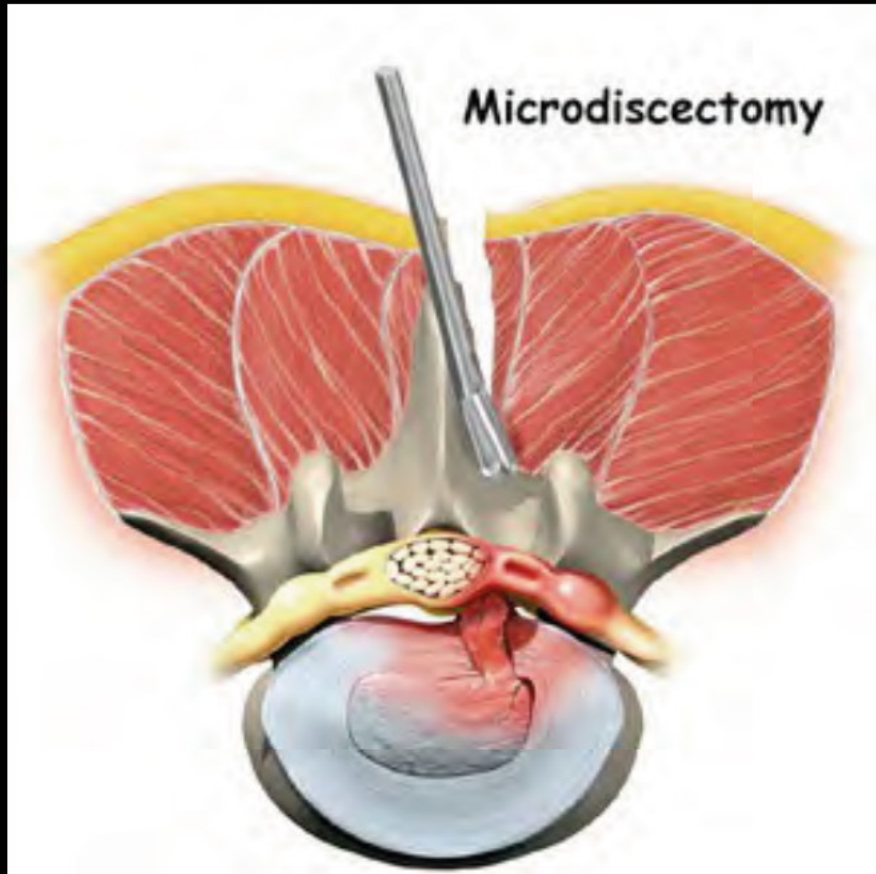
Peroperativ myelografi

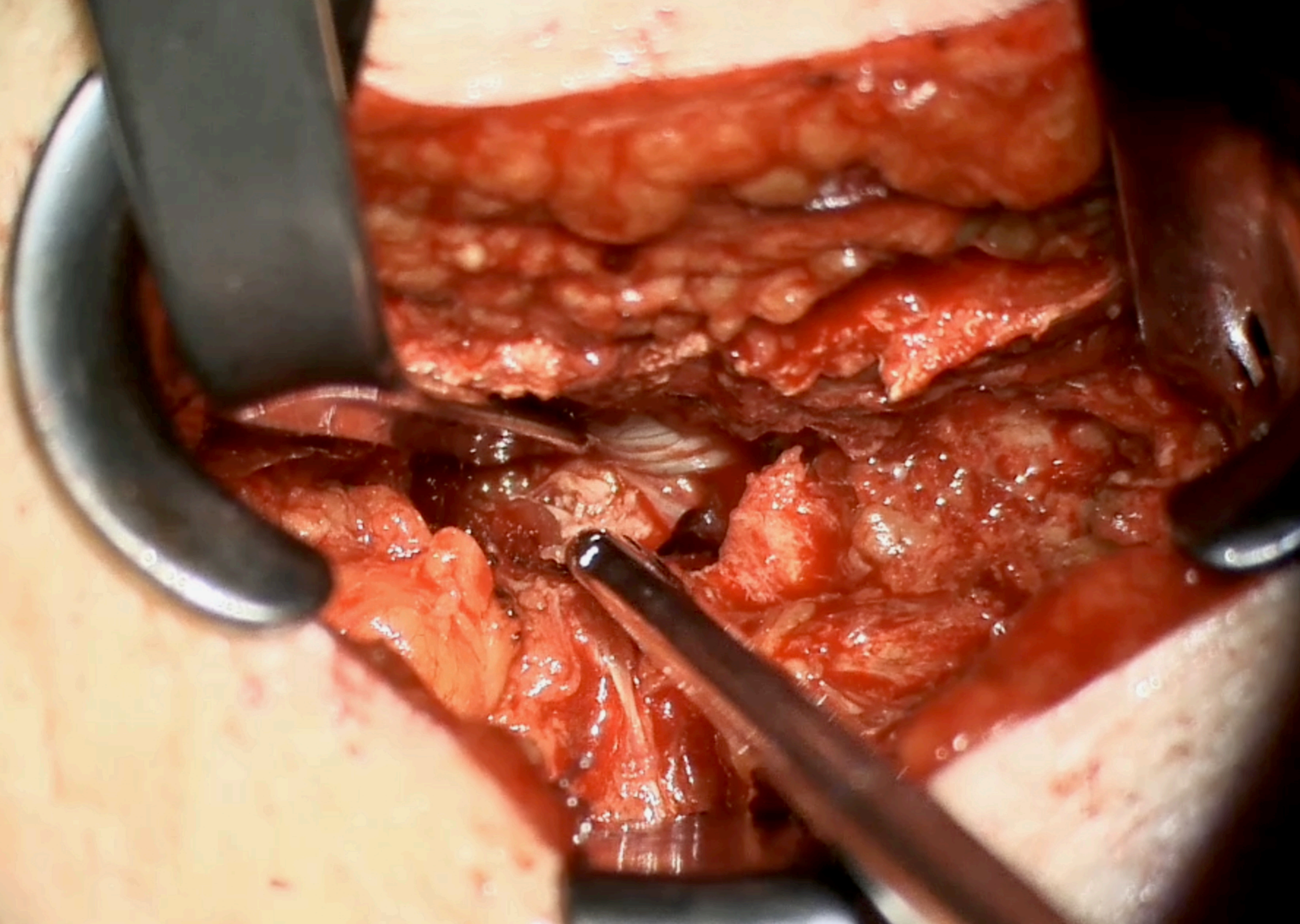


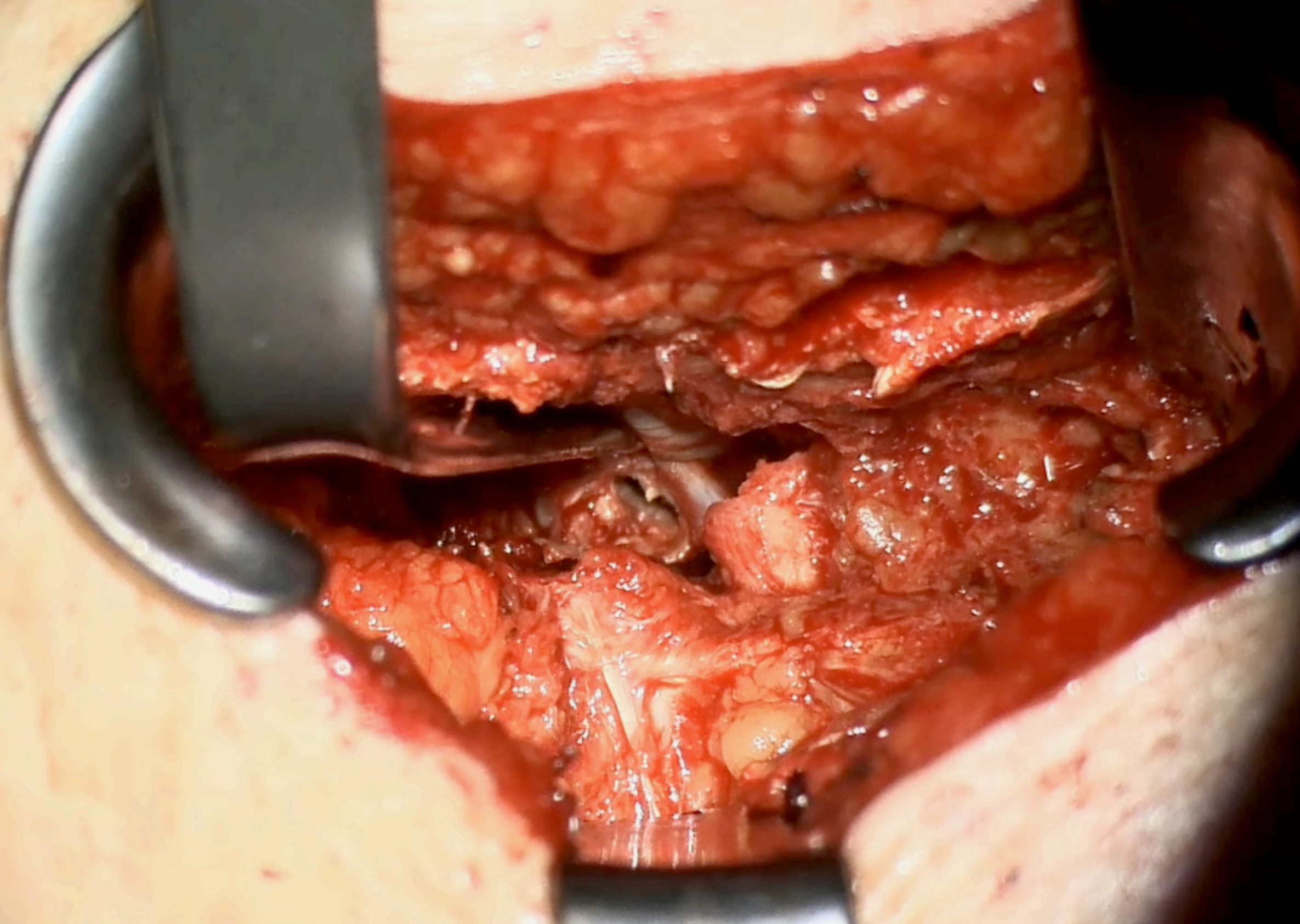




MIKROKIRURGISK INDGŘEB







Effekten af operation

- Diskusprolaps: 8/10
- Stivgørende operation i lænden: 2/3

Prognose

- **LSS:** ODI falder fra 42 til 27, VAS-ben falder fra 58 til 33, VAS-ryg falder fra 52 til 32. Gangdistancen bedres. Effekten holder mindst 2 år. Bedre effect end nogen anden behandlingsform.
- **LP:** ODI falder fra **46** til **21**, VAS-ben falder fra **61** til **26**, VAS-ryg falder fra 48 til 27. Bedst effekt ved kortere symptomvarighed (< 3 mdr) = det optimale tidspunkt for operation.
- **Bagre dese:** ODI falder fra 46 til 33, VAS-ben falder fra 52 til 35, VAS-ryg falder fra **57** til 41. Bemærk denne gruppe er kroniske smertepatienter med lang smerteanamnese.
- **ACIF:** ODI falder fra 41 til 24, VAS-arm falder fra 56 til **24**, VAS-nakke falder fra 54 til 27. Størst bedring ved symptomvarighed under 3 måneder.
- **Negative prognostiske faktorer:** kvinde, >75 år, BMI>30, ryger, aleneboende eller plejehjem, lavt uddannelsesniveau, hofteartrose, HIS/Hi, astma7KOL, Parkinson, neuropati, gangdistance op til 200 m, LBP, varighed > 6 måneder, smertebehandling > 3 måneder, tidligere lændekirurgi, flerniveaus lidelse, depressionstendens

FORVENTNING

Tiden?
Sygemelding?
Pension?



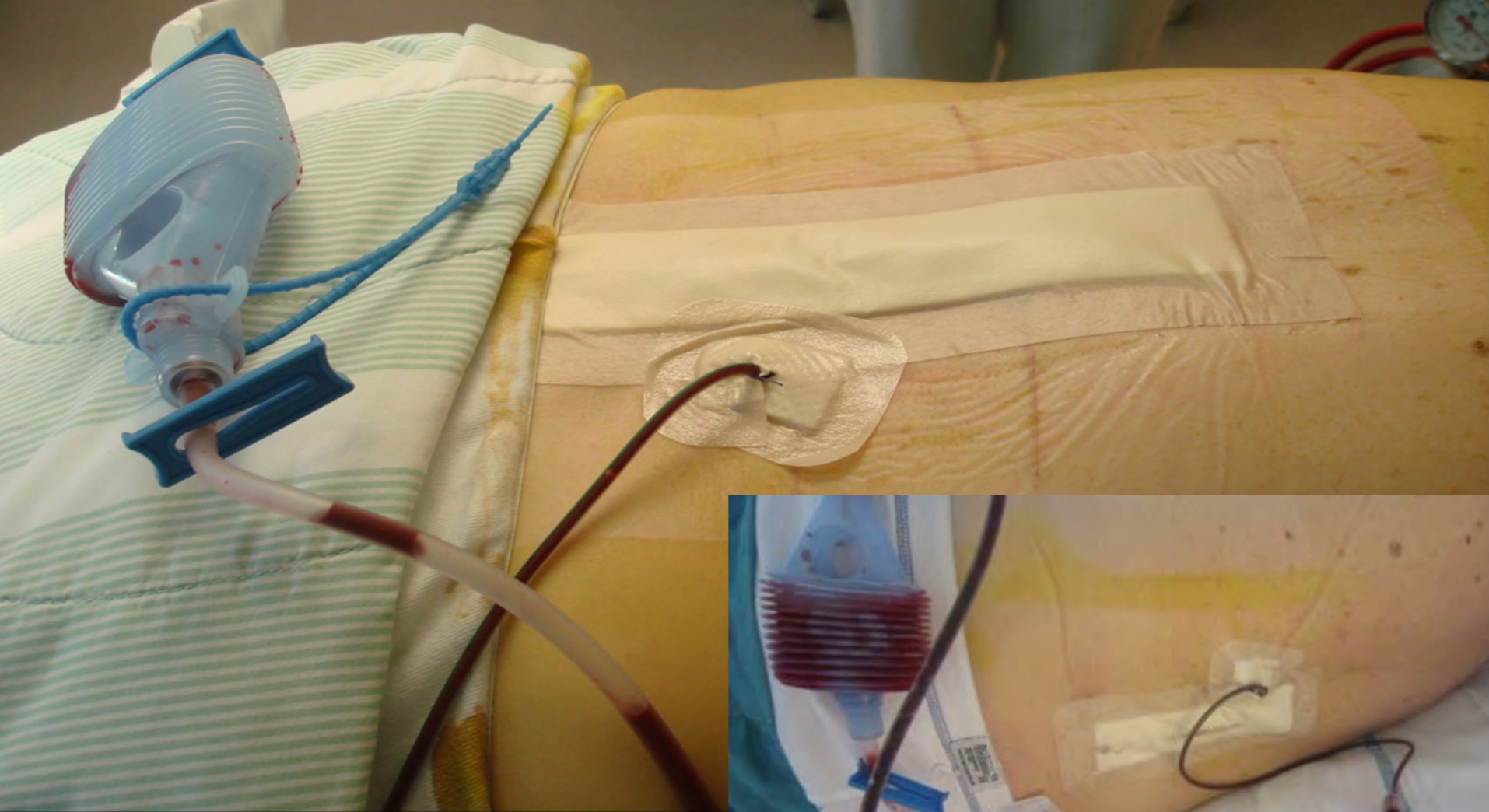
Tabel 7.2. Risikofaktorer for forekomst og kronicitet af lænderygsmærter.

	Forekomst	Kronicitet
<i>Individuelle faktorer</i>	- Alder - Fysisk form - Arvelighed - Nedsat udholdenhed af rygmuskulatur - Rygning - Dårligt helbred - Lavt uddannelsesniveau - Lav socialgruppe	- Overvægt - Kraftig smerte og funktionsnedsættelse - Ischias smerter - Langvarig sygemelding
<i>Psykosociale faktorer</i>	- Stress - Bekymring - Dårlig kognitiv funktion - Lav jobtilfredshed	- Depression - Somatisering - Aggraverende (overdreven) sygdomsadfærd
<i>Arbejdsrelaterede faktorer</i>	- Dårligt arbejdsmiljø - Mange belastende vrid - Mange gentagne bevægelser - Mange helkropsvibrationer	- Arbejdsskadesag, erstatningssag eller pensionssag under behandling - Tungt arbejde / mange løft ved tilbagevenden til arbejde



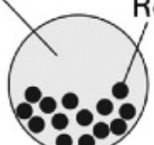
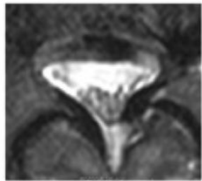
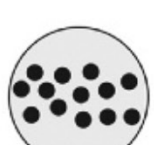
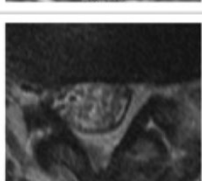
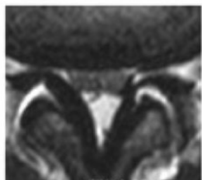
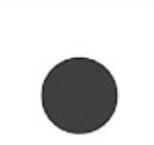
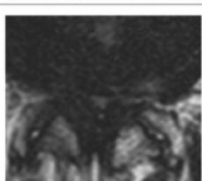
Risikofaktorer og komplikationer

- **Ufuldstændig/manglende effect:** 5-50%, manglende forventningsafstemning, forkert diagnose? kronisk nerveskade? (mere end 2 år) Manglende præoperativ coretræning? (ALIF), psyko-sociale udfordringer (jobmæssigt). **Symptomrecidiv:** restenose/prolaps, ny stenose/prolaps, adjacent level
- **Blodansamling/blødning:** 1%, blodfortyndende medicin (også NSAID og visse naturpræparater) pauseres, transfusion? EDH (myelopati/CES), luftvejsobstruktion (ACIF), perforation af aorta (ekstremt sjældent ved LP), vena cava (ALIF). Vertebralislesion. Postoperativ anæmi.
- **Infektion:** overfladisk eller dyb, meningitis (sjældent), hyppigere ved **diabetes** og steroidbeh., rygning, UVI, spondylodiscitis, absces, mediastinit/sepsis (ved øsofaguslesion).
- **Nerveskade:** <1/2%, evt parese, evt forkert skrueplacering, forværring af myelopati, hæshed (ACIF 4%), sfinkterproblemer, impotens. Horners syndrome. Retrograd ejaculation (infertilitet) samt tør skede: ved ALIF.
- **Durarift:** 5%, kan give hovedpine, behandles med sutur, lim, 2 døgns sengeleje evt. Liquordrænage, forøget ved **tidligere kirurgi** samt **multiple niveauer** hos **ældre**
- **DVT:** 2%, kan give lungeemboli, modvirkes ved tidlig mobilisering og Innohep
- **Implantatsvigt:** skrueløsning/subsidence (**osteoporose**), non-union (9% hos **rygere**)
- **Instabilitet:** ved decompression fjernes knoglevæv, stor risiko ved **Parkinsonisme** (PISA-syndromet)
- **Abstinenser:** obs alkoholforbrug.
- **GI:** obstipation (morfika), ileus, dysfagi, globulusfornemmelse, **overvægt** øger generelt risikoen for reoperation
- **Arvæv:** keloid, rodtryk
- **Smerter:** "kørt over af en damptrommel"
- **Narkose:** obs betydelig **komorbiditet**, BT-fald, apoplexi? AMI?
- **Pneumothorax:** v. Oracle
- **Død:** sepsis, meningit, aortalæsion, mesenteriel iskæmi, lungeemboli.



- Marevan
- Clopidogrel
- Magnyl
- Fiskeolie



Cerebrospinal fluid Rootlets 	A1	
	A2	
	A3	
	A4	
	B	
Posterior arch Epidural fat 	C	
	D	

No stenosis

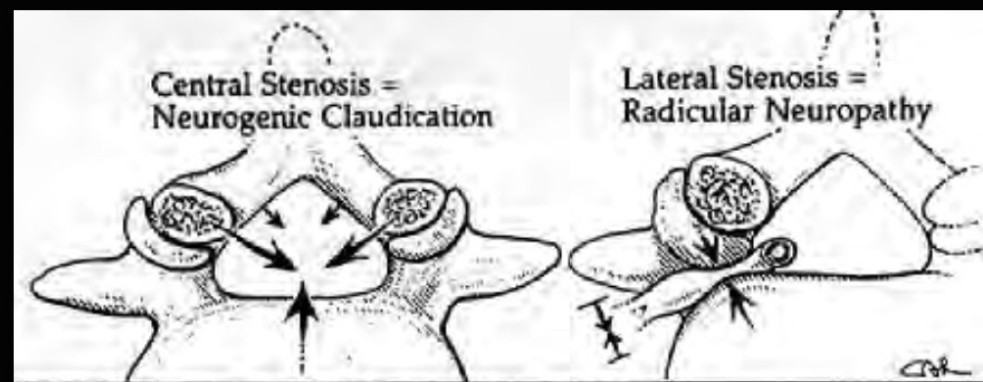
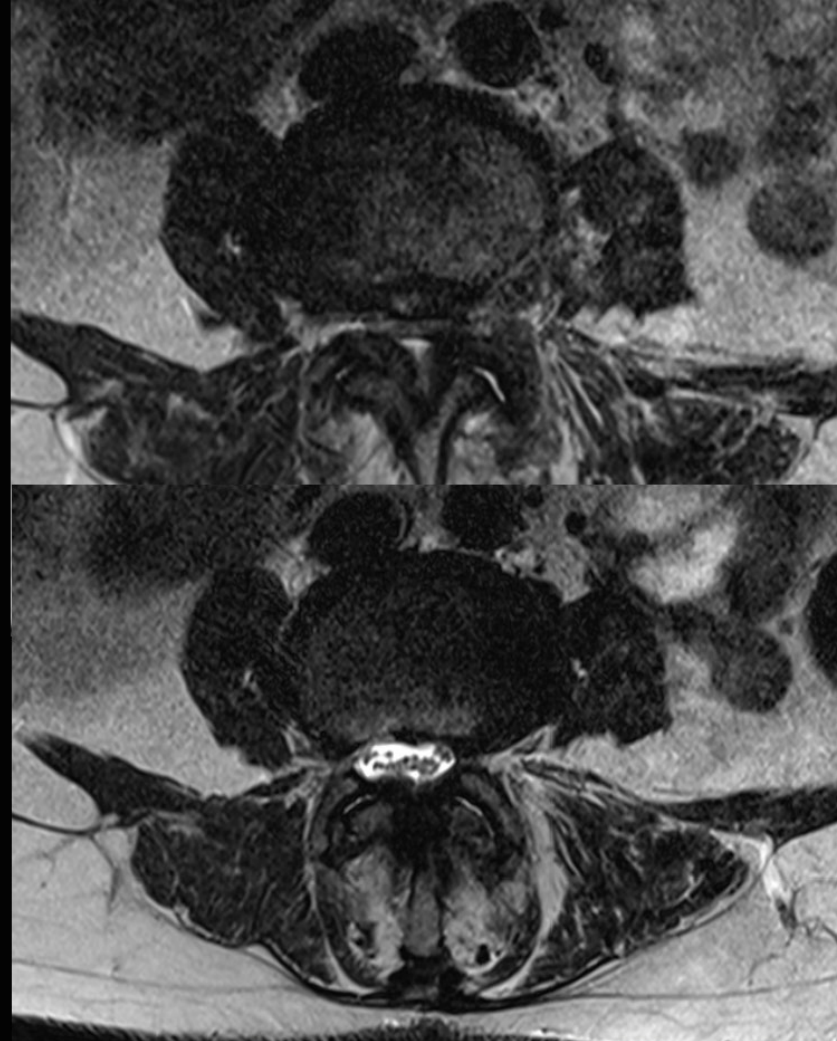
Moderate

Severe

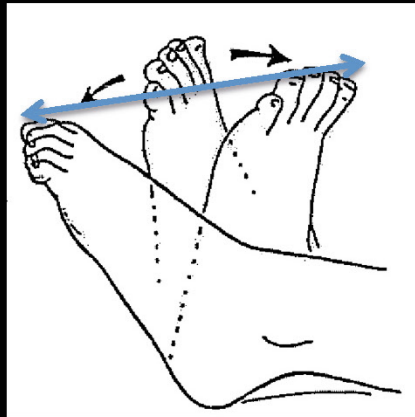
Extreme

Schizas-diagram til vurdering af radiologisk sværhedsgrad

Hvis der samtidig er betydelig **neurogen claudicatio** og tilmed manglende effekt af måneders konservativ behandling, kan operation komme på tale – hvis pt. ønsker det og tåler det



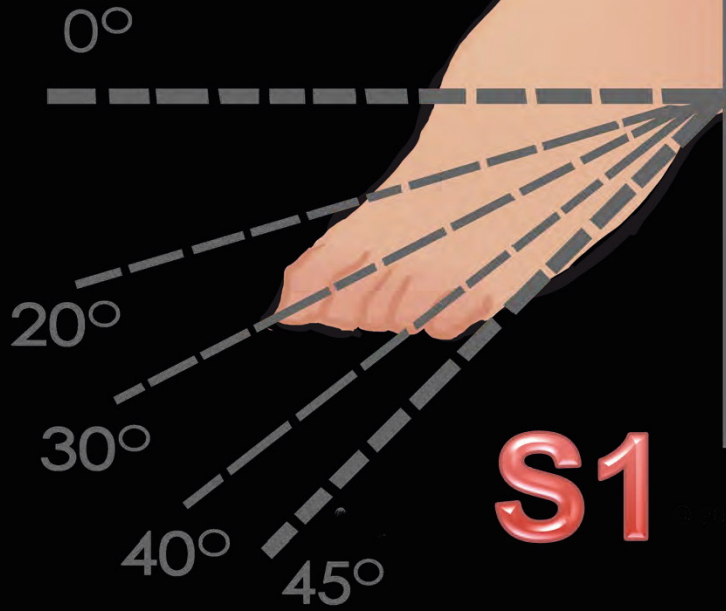
Plantar Flexion



DROPFOD

Dorsiflexion

L5



Smertedæk – Overtal – Varighed?

Cervikal spondylodisk myelopati

- C3-Th1: ved CSS
- Decompression specielt ved progredierende motoriske udfald (parese, styringsbesvær af ben)
- Akut ved tværsnit.
- Anamnese bekræftet ved MR og neurologisk undersøgelse (1. neuron).
- Udeluk anden neurologisk forklaring (ALS, MS).
- Indgreb: 21, Fryckholm, 60. Dese ved instabilitet.

Supranukleær læsion

Upper Motor Neuron syndrome, CNS,
"Pyramidebanelæsion", "1. neurons påvirkning",

- Hyperrefleksi
- Fodklonus
- Spastisk tonusøgning
- Babinskis tåfænomen
- Hoffman's refleks
- Sensibilitetsgrænse
- Para/tetraparese
- Blæreparalyse
- Evt. let atrofi

Eksempler: Cervikal eller thorakal myelopati. Akut medullært tværsnitssyndrom, evt. af inkomplet type: Brown-Séquard, centralt, anteriort, posteriot.

OBS: tidsfaktor for udvikling af de klassiske supranukleære tegn: Spinalt shock initialt med slap parese, manglende senereflekser og atonisk blæreparalyse.

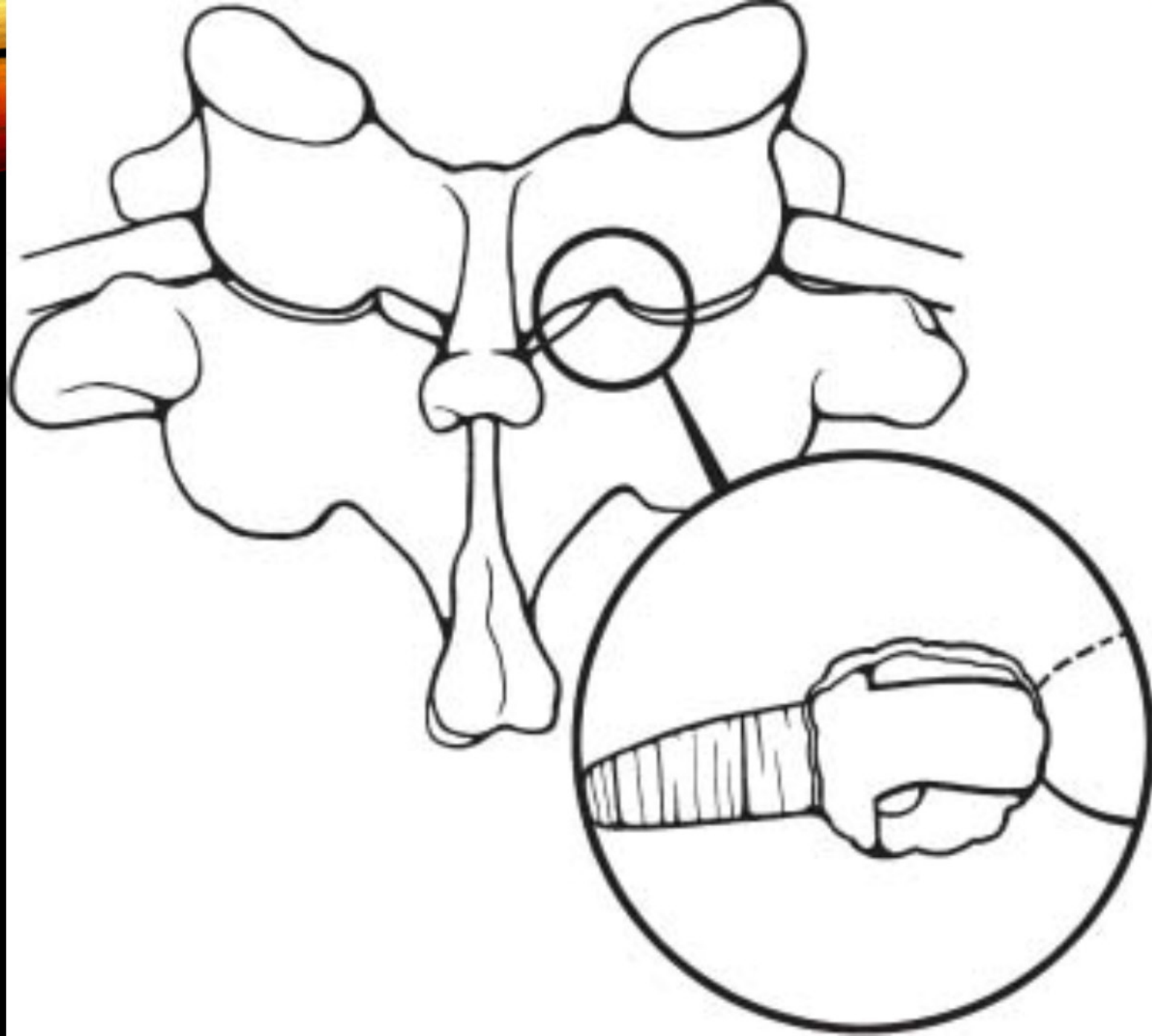
- Tumor? EDH? Absces? TP?
- Stenose?

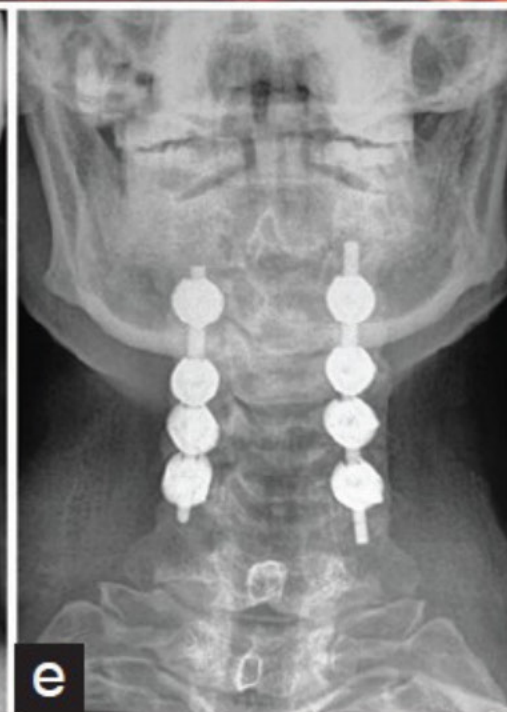
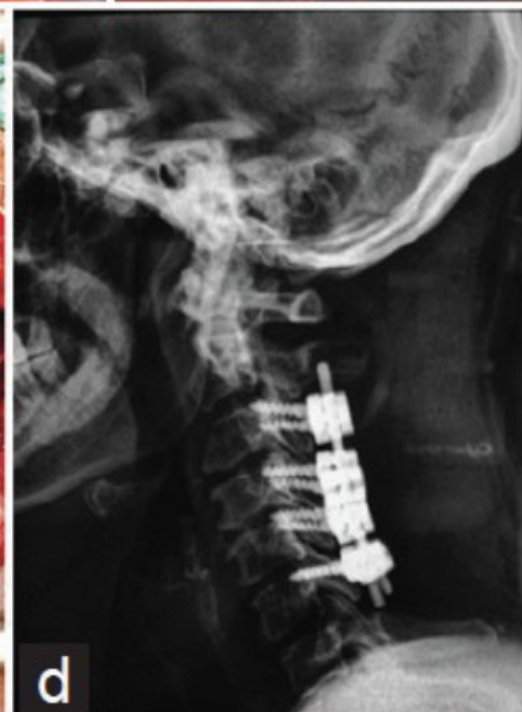
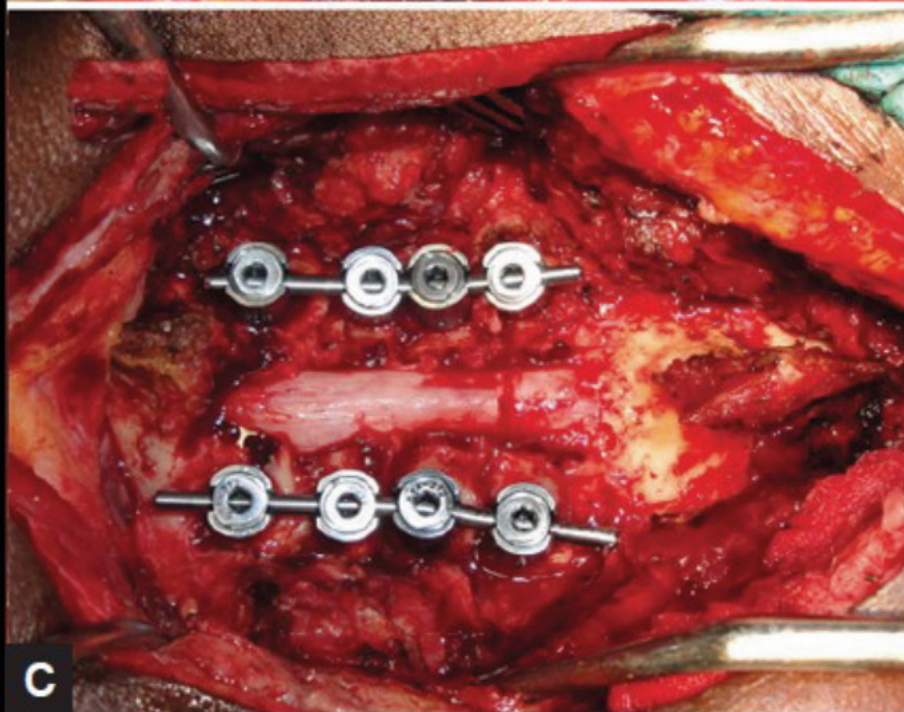
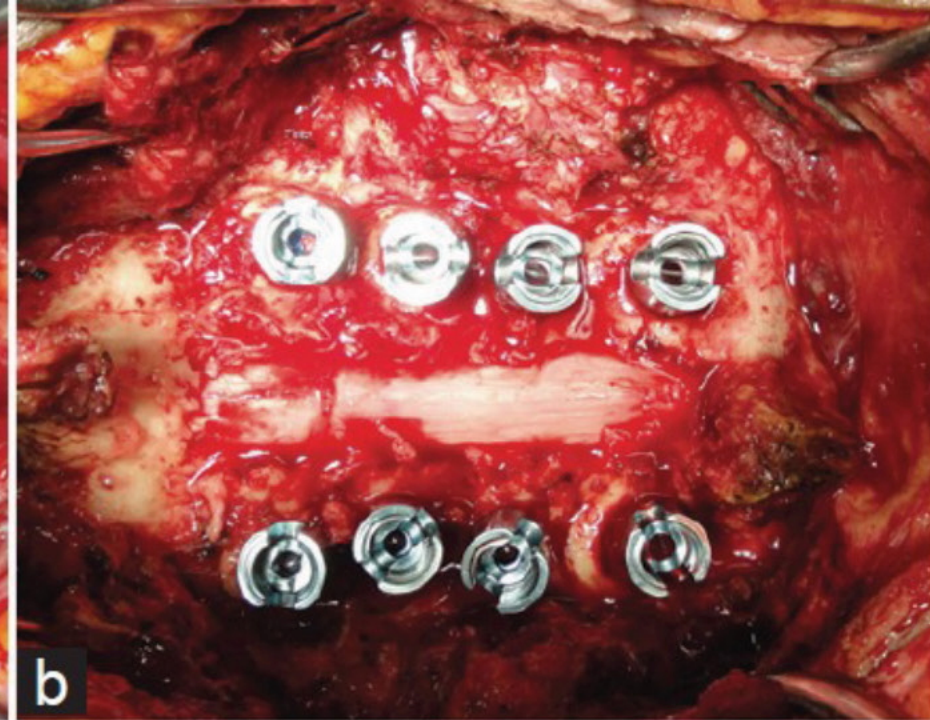
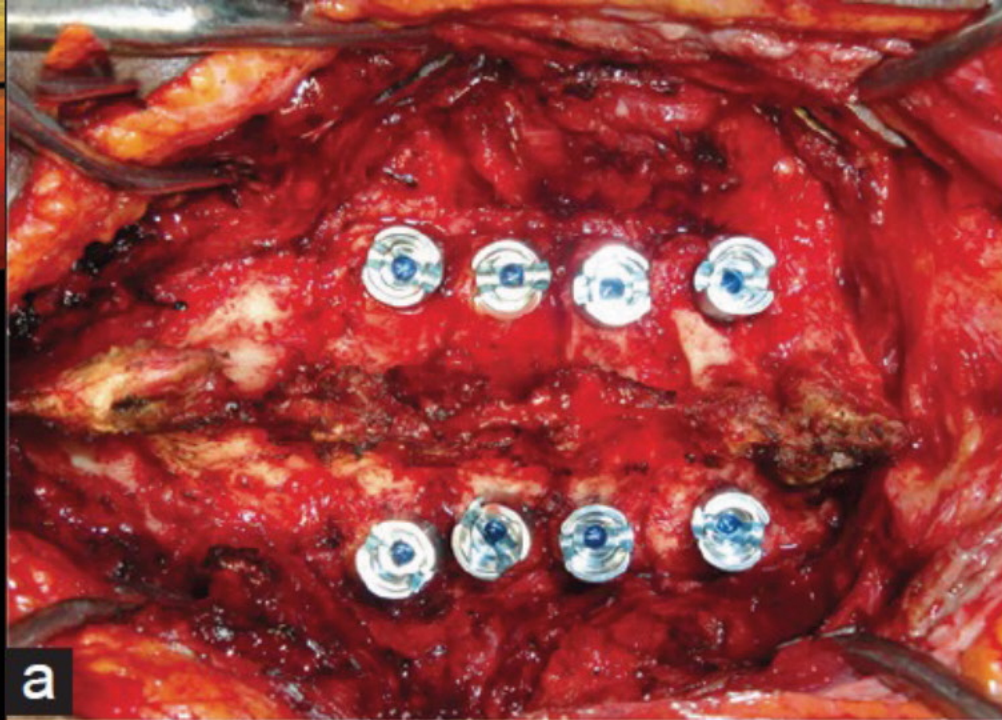
Thorakal myelopati

KOMPLIKATIONER

- Globulus
- Hæshed (4%)
- Øsofagus
- Hæmatom
- Myelopati
- Horner

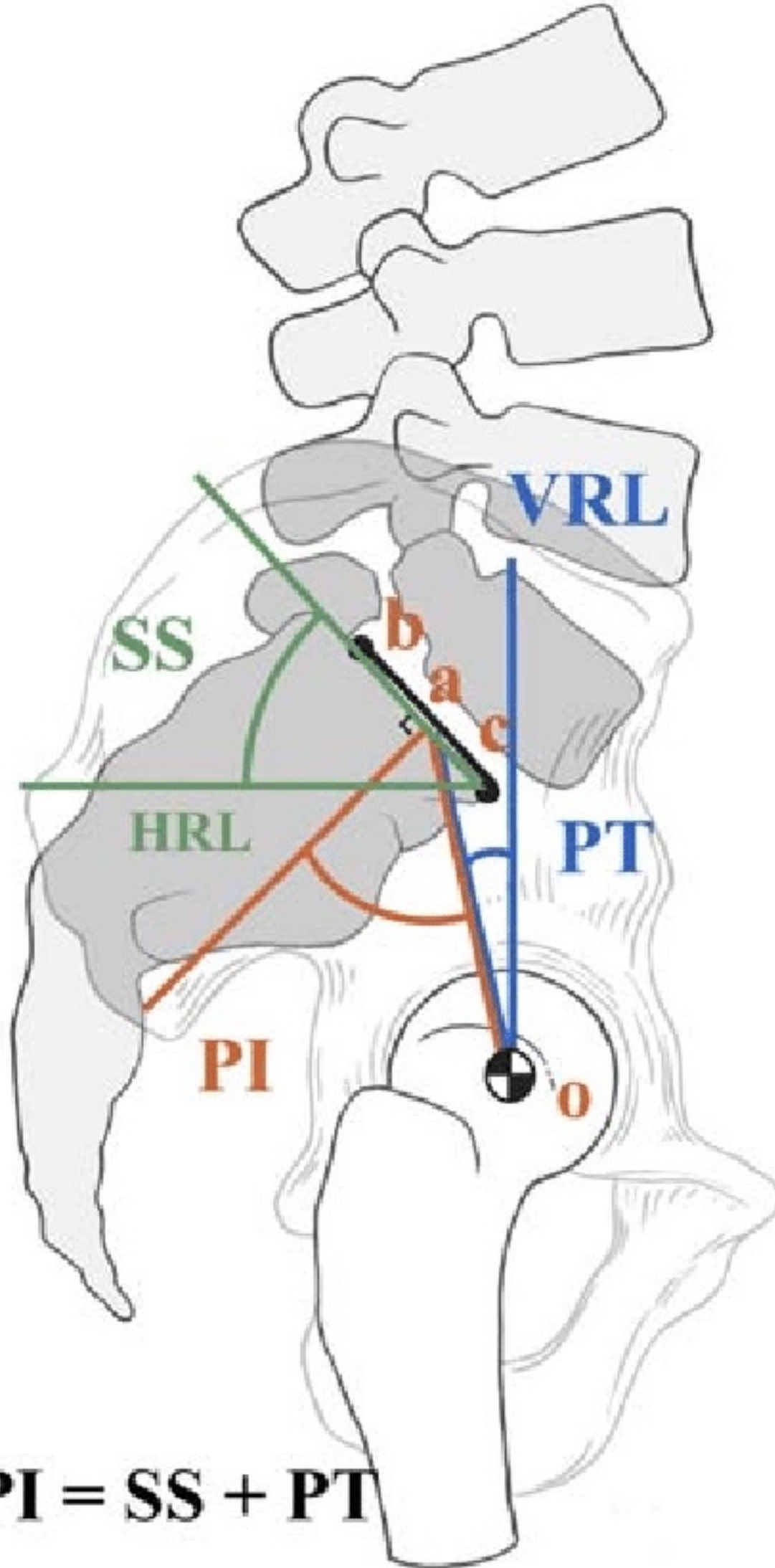






Axiale lændesmerter

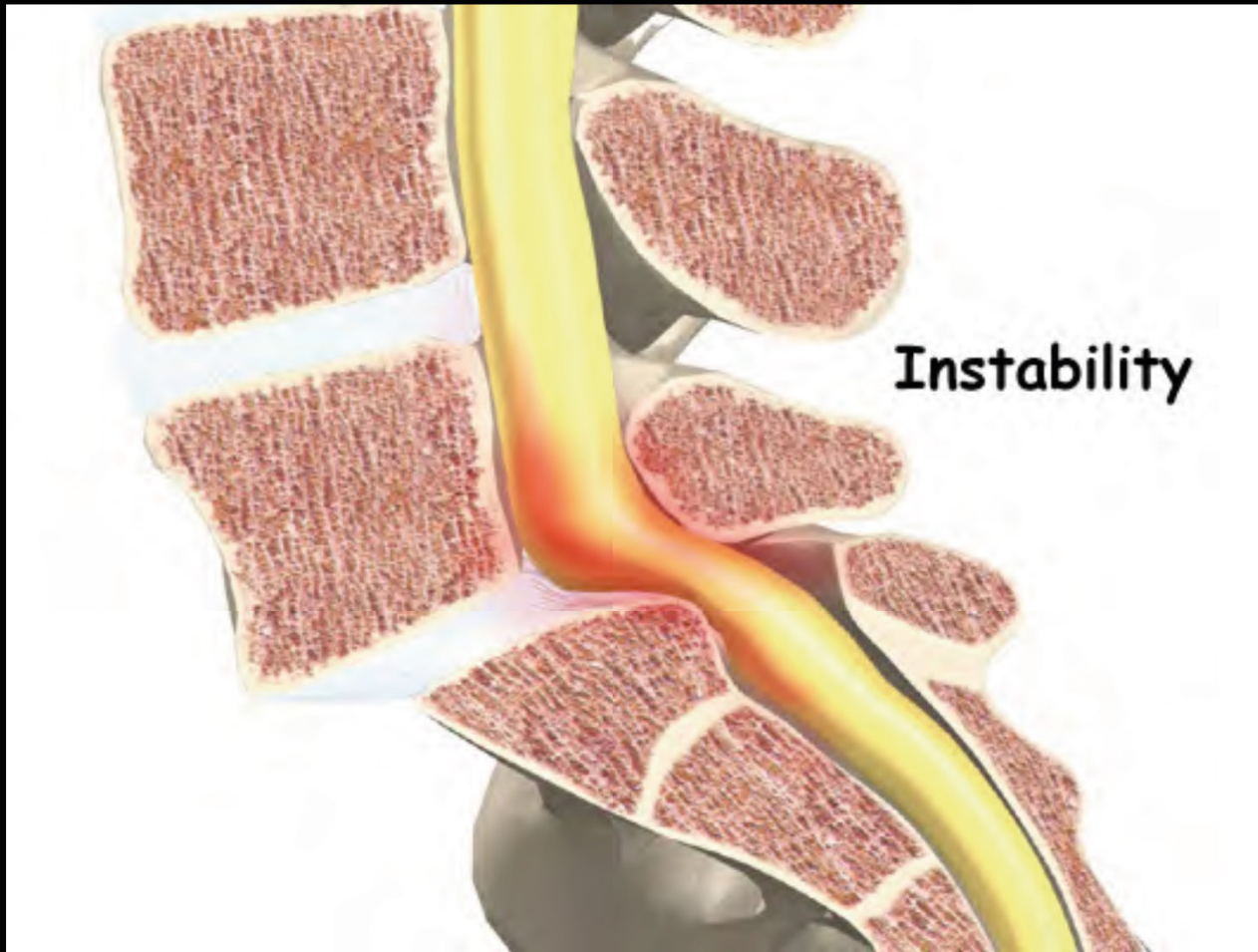
- L1, L2, L3, L4, L5: lokaliserede diskogene smerter, Modic, arcolyse/listese (ledskred), facetledsartrose, instabilitet, rygsækvhed (skoliose)
- Indgreb: 44, 64, 74
- Udeluk differentialdiagnoser: myoser, facetledssyndrom, hofteartrose, trochanterbursitis, back mouse/lipom, referred pain, zoster, endometriose, Bertolotti, SI-led, fibromyalgia, cluneal nerves, coccydynia, piriformis, (osteoporotisk) fraktur, spondylodiskitis, Kissing spine, somatisering, depression, aktiv forsikringssag, Scheuermann, axial atrit, tumor
- Prognose: rygestop, præoperativ coretræning.



$$PI = SS + PT$$

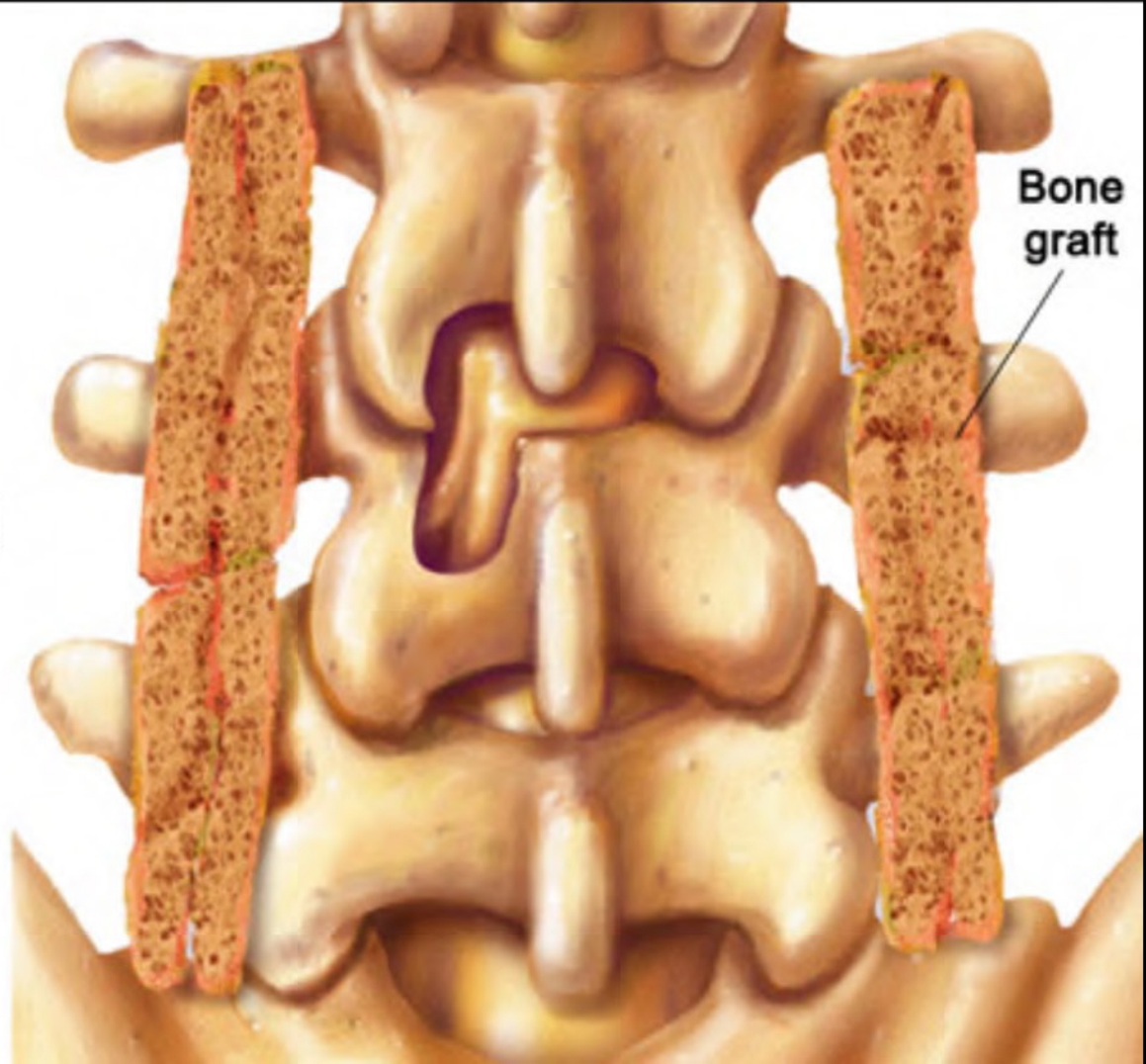
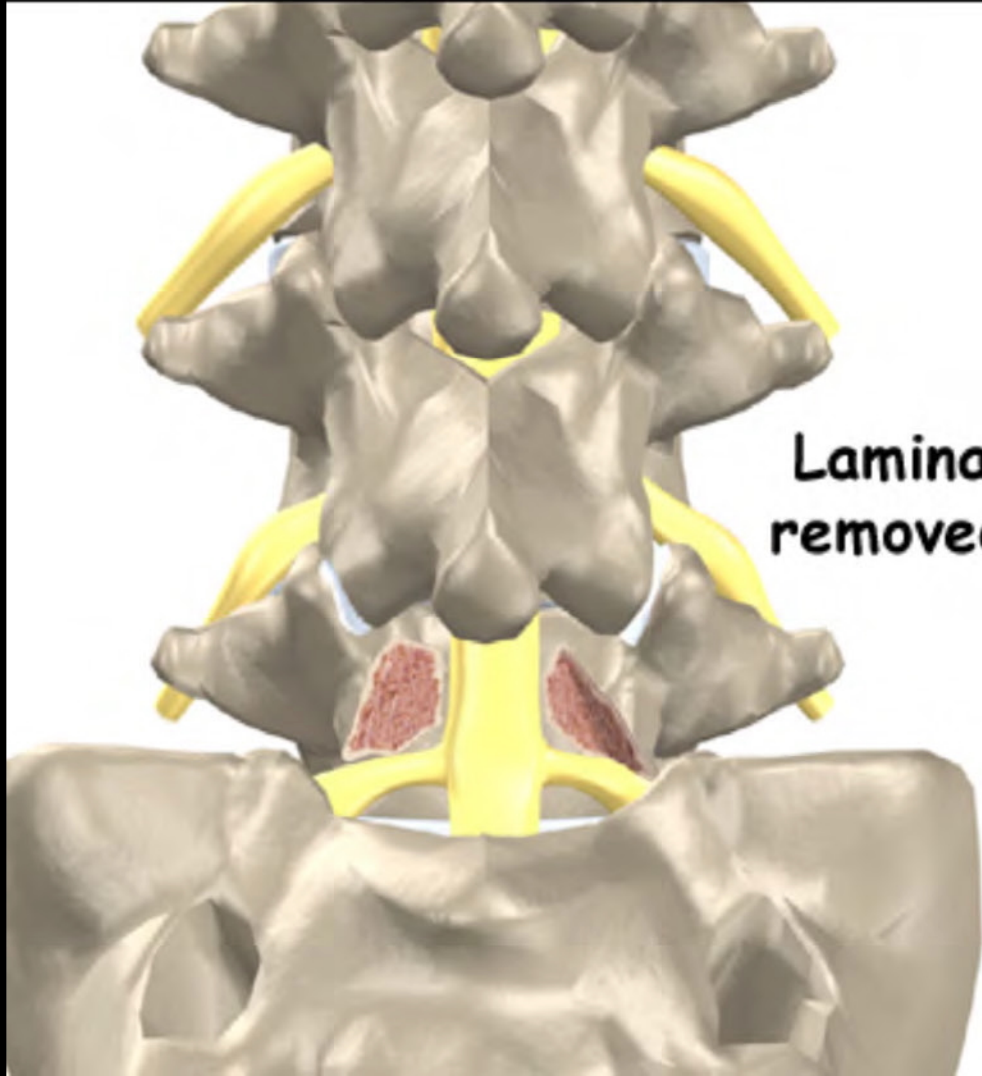
Evt. sammen med olistese (glidning)

I givet fald udføres spondylodese (stivgørende operation)



Laminektomi, rodfrilægning, NID

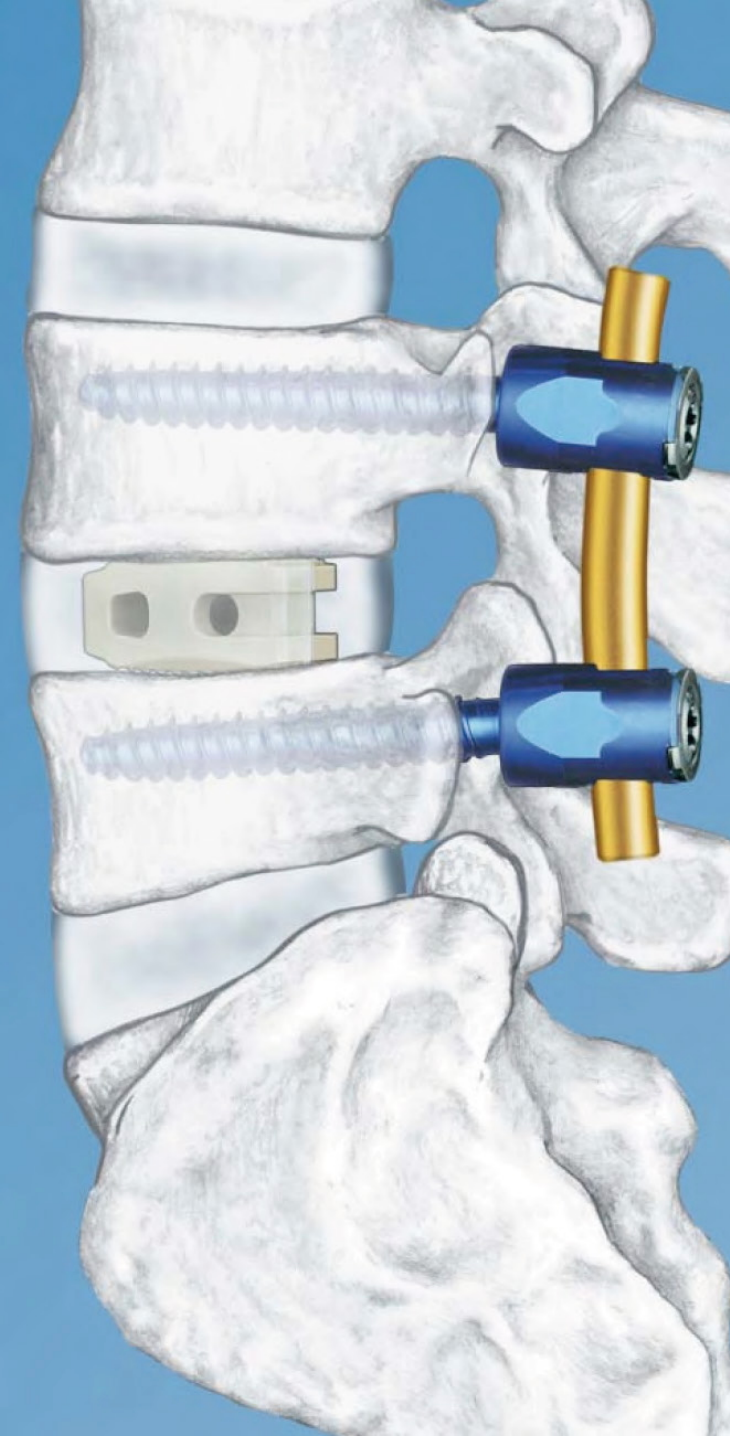
Facetleddet bevares – 4% udvikler instabilitet



L4/L5-Dese

Transforaminal Lumbar Interbody Fusion

- Pedikelskruer
- Stave
- Diskectomi
- TLIF-Spacer (Opal)
- Knoglestykker evt. transplantat



ALIF

SHOCK



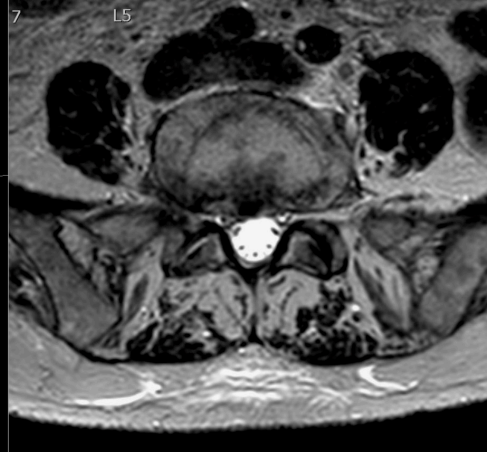
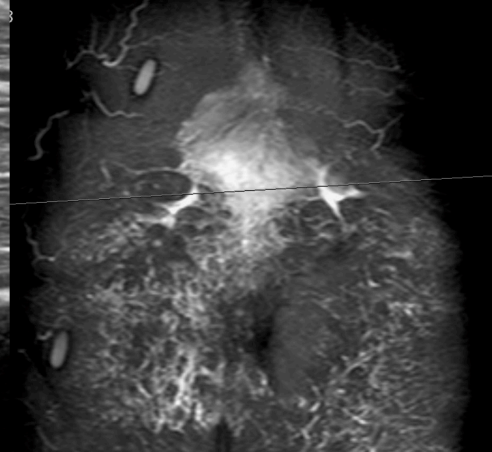
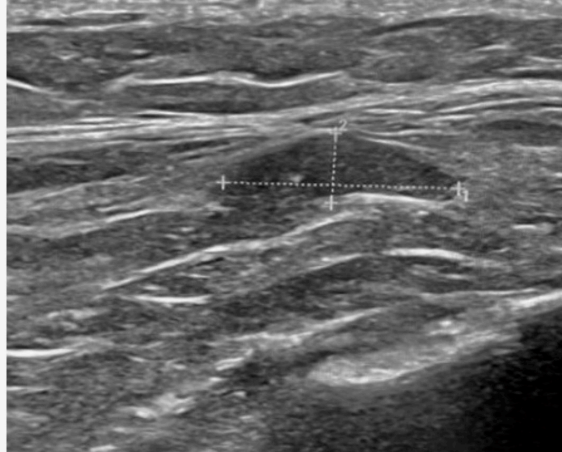
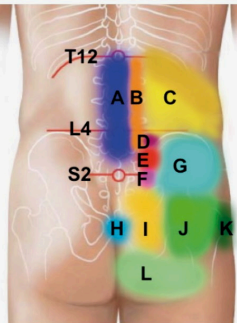
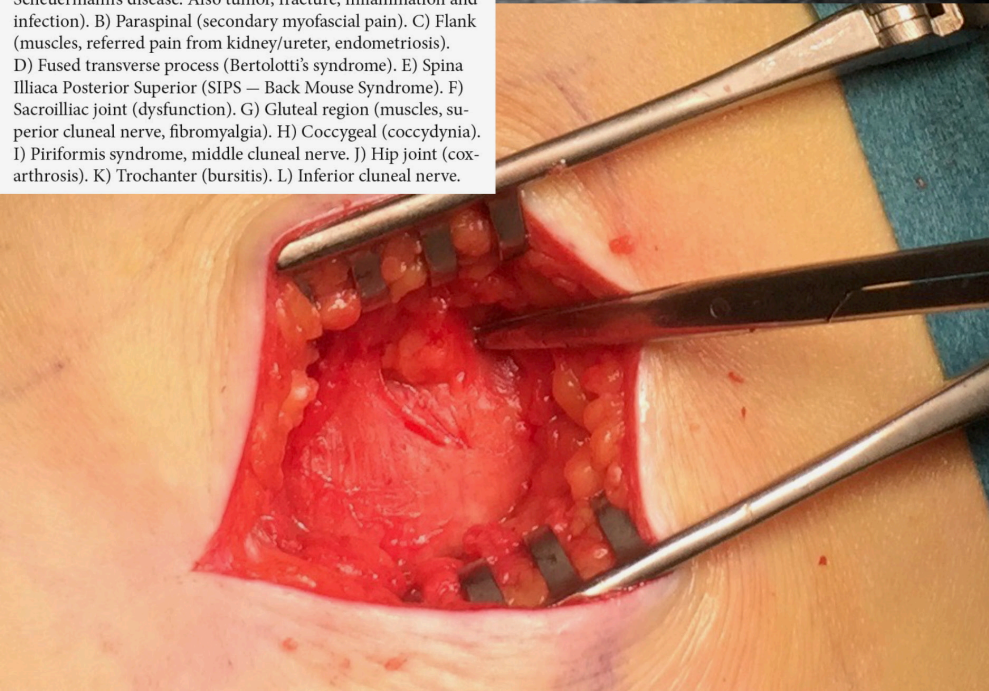


Figure 1: Lumbar pain zones seen with different generators:

A) Axial (discs, vertebrae, facets, endplates, spinous processes — degenerative changes e.g. disc degeneration, -herniation, Modic changes, HIZ, Schmorl's node, spondylolisthesis, scoliosis and Scheuermann's disease. Also tumor, fracture, inflammation and infection). B) Paraspinal (secondary myofascial pain). C) Flank (muscles, referred pain from kidney/ureter, endometriosis). D) Fused transverse process (Bertolotti's syndrome). E) Spina Iliaca Posterior Superior (SIPS — Back Mouse Syndrome). F) Sacroiliac joint (dysfunction). G) Gluteal region (muscles, superior cluneal nerve, fibromyalgia). H) Coccygeal (coccydynia). I) Piriformis syndrome, middle cluneal nerve. J) Hip joint (coxarthrosis). K) Trochanter (bursitis). L) Inferior cluneal nerve.



Biopsy of Nodules

*Cluneal
Nerves*

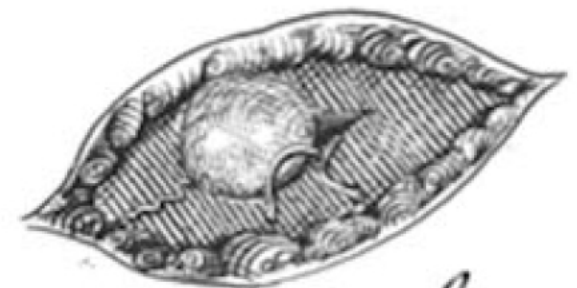
*Edematous Fatty
Lobule*



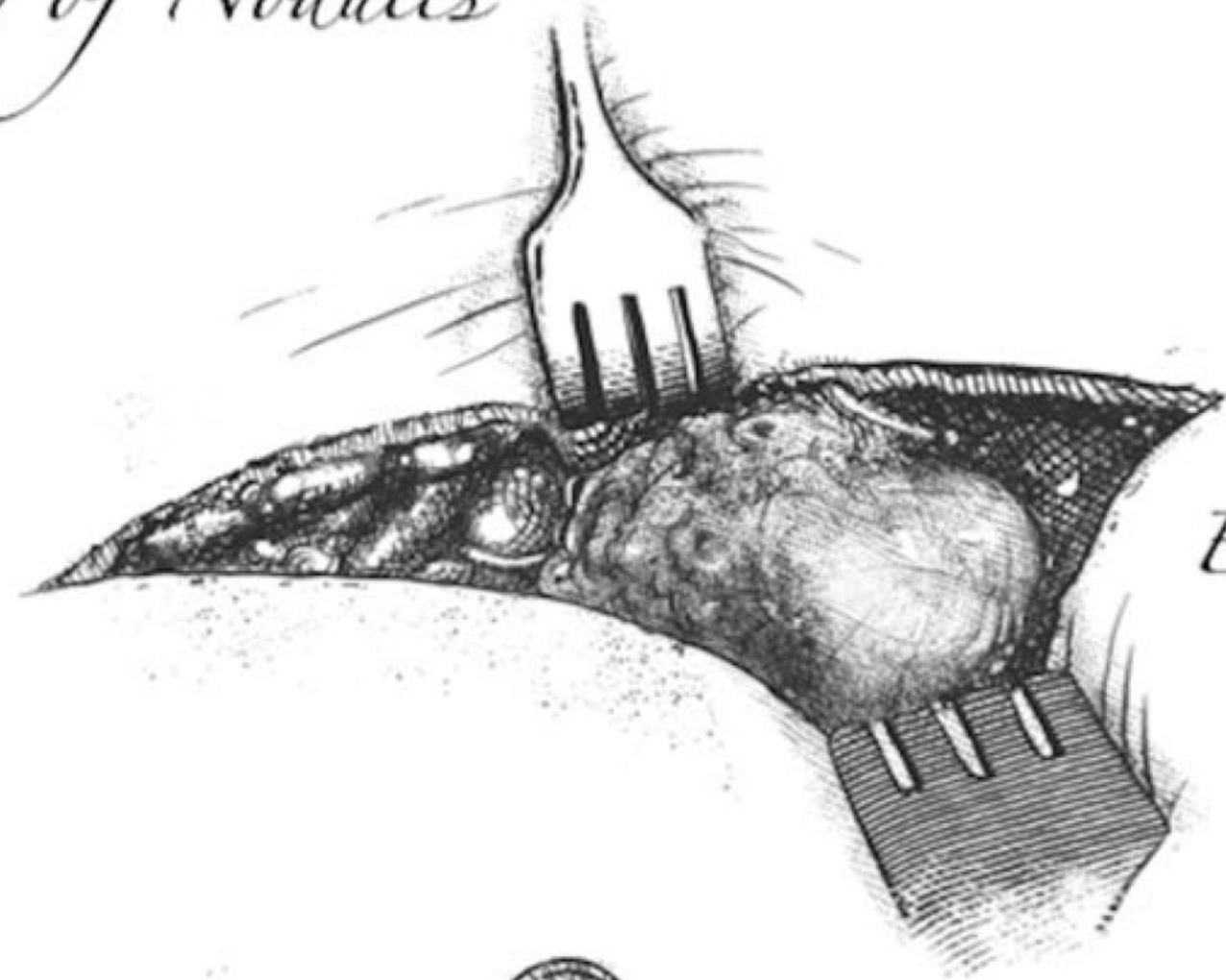
*Non-Pedunculated
Hernia*



*Pedunculated
Hernia*



*Foraminal
Hernia*



Distribution of Surgery Effects with Statistical Model Information

