GEIO
GRUPO DE ESTUDIO DE LA INFECCIÓN OSTEOARTICULAR
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XI Reunión Científica GEIO

Grupo de Estudio de Infección Osteoarticular - SEIMC

Osteomielitis vertebral

¿Cuándo debemos plantearnos manejar la osteomielitis vertebral mediante cirugía? Opciones quirúrgicas disponibles.

Susana Núñez Pereira

Hospital Vall d'Hebrón, Barcelona



Declaración de “intereses”



Kramer et al.

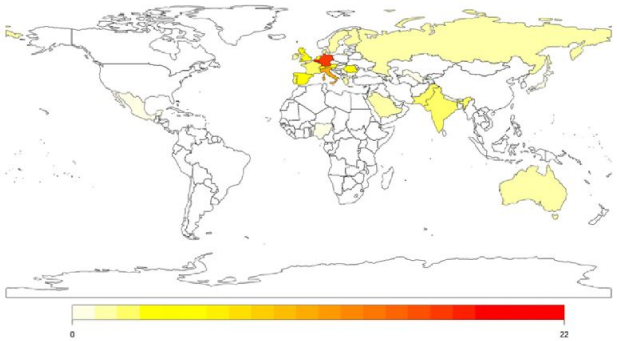
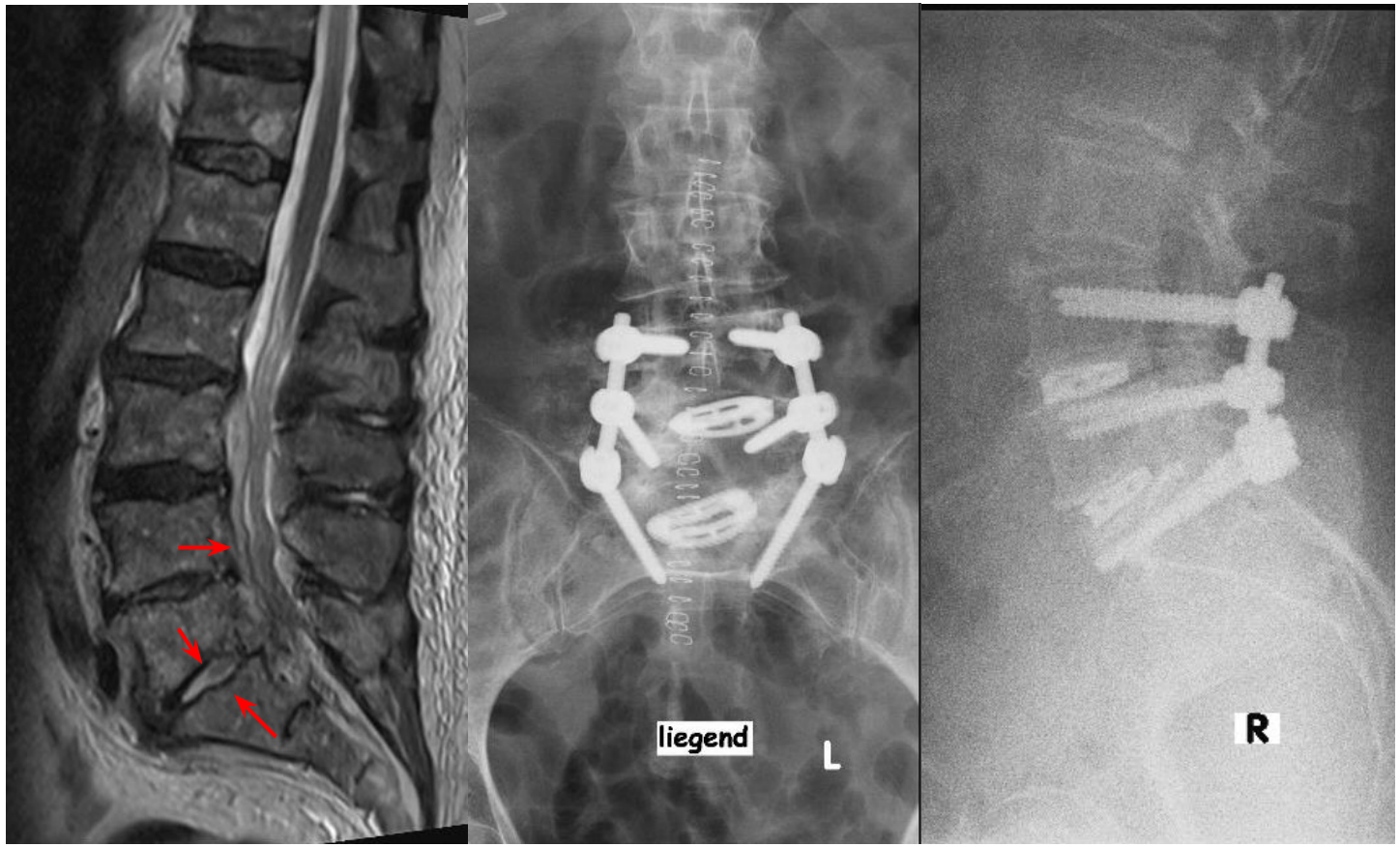


FIG. 2. World heat map of participants' home countries. This map was created using R software (version 4.0.4). Figure is available in color online only.

Kramer 2024 *J Neurosurg Spine*



¿Sus argumentos?

- Ubi pus, ivi evacua…
- Estabilización como herramienta para disminuir la infección
- Movilización precoz y recuperación funcional más rápida
- El aumento de infecciones postoperatorias en pacientes intervenidos por infección primaria no es muy llamativo

Historia natural

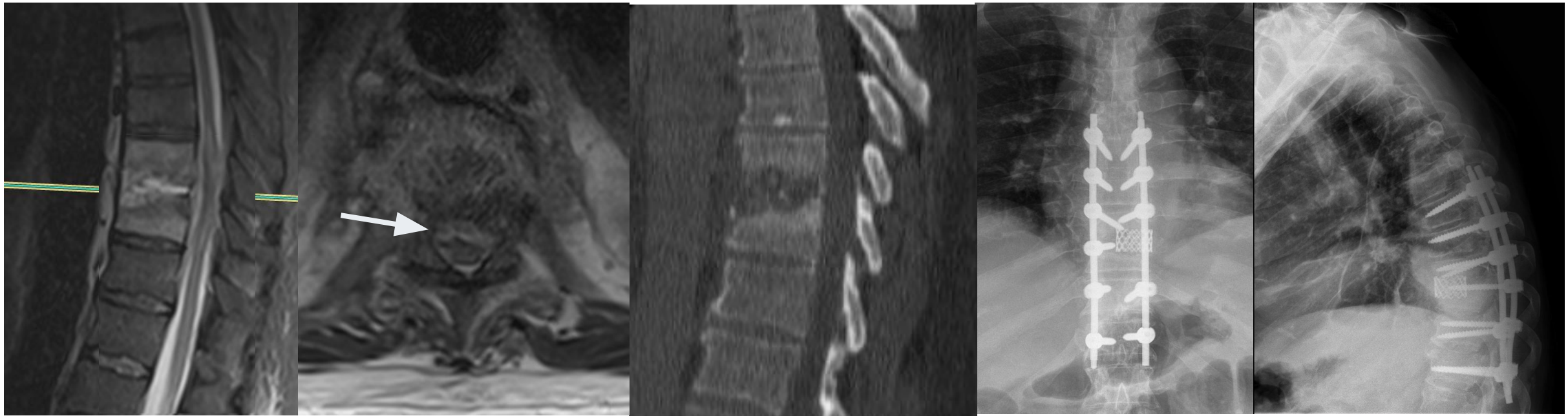


Indicaciones de tratamiento quirúrgico

- Lesión neurológica o compresión medular severa con alto riesgo de lesion neurológica
- Drenaje de abscesos, obtención de muestras y disminución de la carga bacteriana
- Fijación en caso de inestabilidad
- Reconstrucción de deformidades secundarias

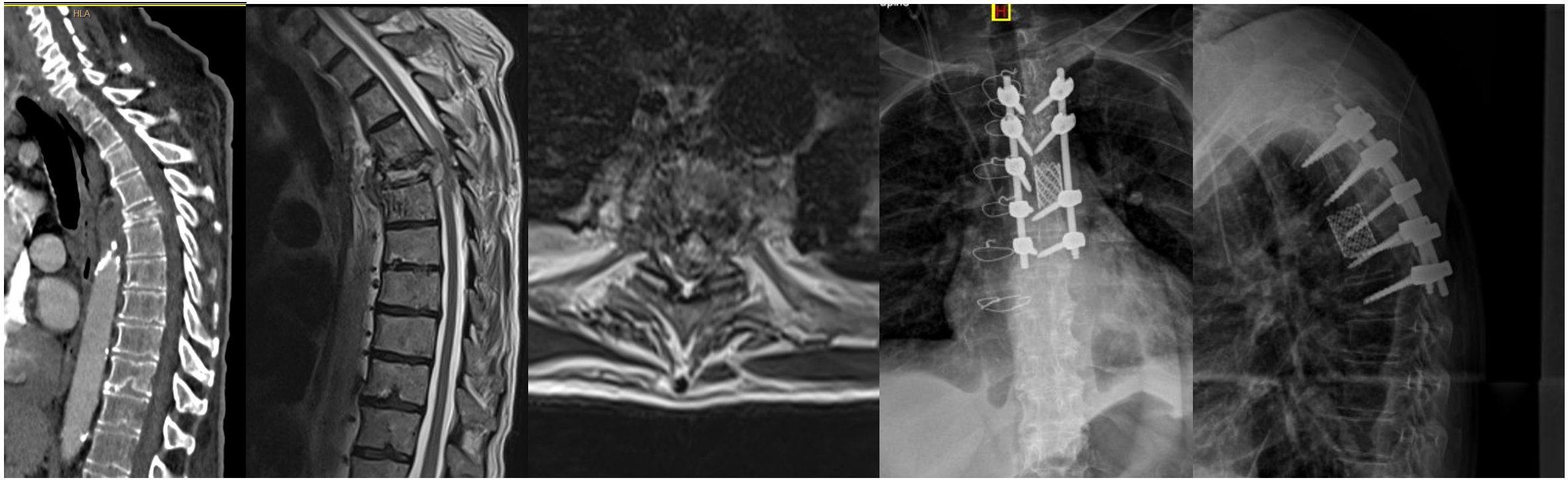
Lesión neurológica

- Inestabilidad
- Lesión neurológica compresión/isquemia/inflamación



75 años, ingreso por lesión medular aguda AIS A, antecedente de dolor dorsal

Lesión neurológica



78 años, insuficiencia renal con diálisis, PTR infectada, deterioro neurológico repentino AIS C

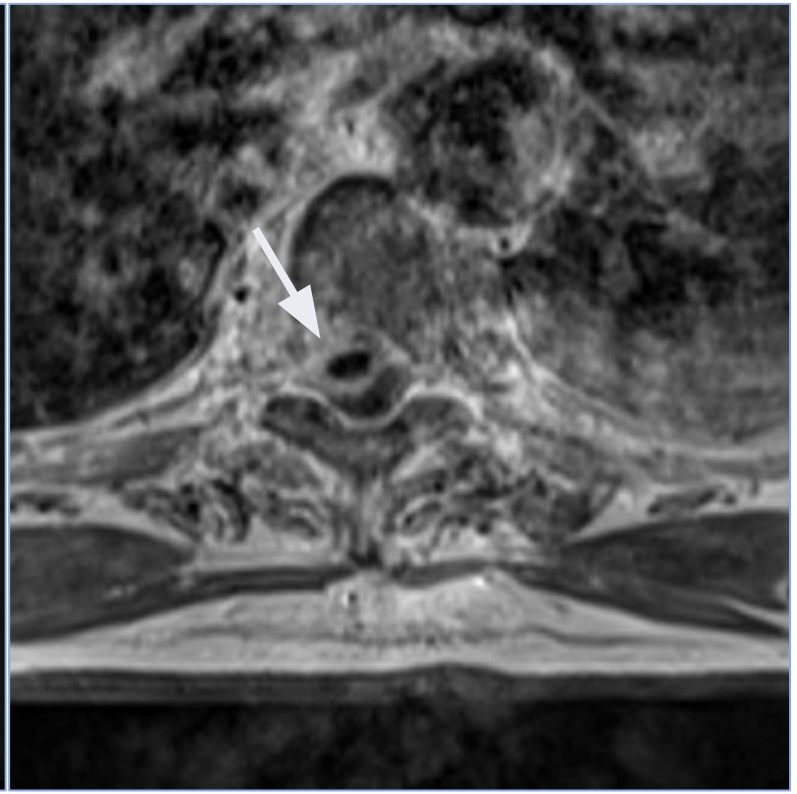
Compresión medular con riesgo inminente de lesión



Drenaje de abscesos y disminución de carga bacteriana







¿Inestabilidad?






Inestabilidad espinal es la pérdida de la capacidad de la columna vertebral para mantener, bajo cargas fisiológicas, las relaciones normales entre sus segmentos vertebrales, de modo que se produce o existe riesgo de producir daño neurológico, deformidad progresiva o dolor incapacitante.

White and Panjabi 1990

Criterios de inestabilidad en metástasis vertebrales

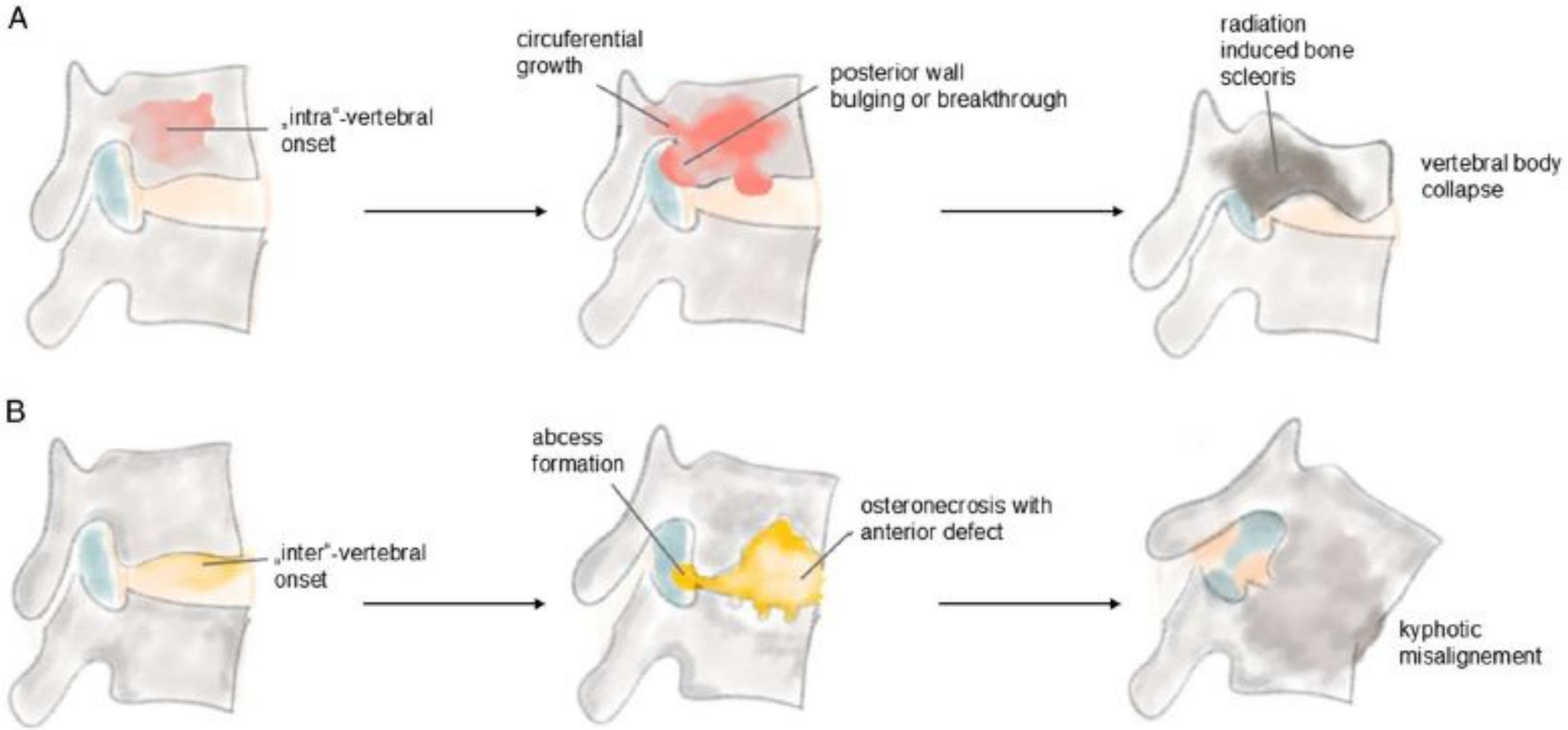


SPINAL INSTABILITY NEOPLASMA SCORE (SINS) – GRAPHICAL TABLE

SINS 0-6: "STABILITY" | SINS 7-12: "POSSIBLE INSTABILITY" | SINS 13-18: "INSTABILITY"

Score	4	3	2	1	0
Location		**Junctional** C0-C2, C7-T2, T11-L1, L5-S1	**Mobile spine** C3-C6, L2-L4	**Semi-rigid** T3-T10	**Rigid** S2-S5
Pain		**Yes** (relief with recumbency and/or pain with movement/loading of spine)		**No** (occasional pain but not mechanical)	**Pain free lesion**
Bone lesion			Lytic 	Mixed lytic/blastic 	Blastic 
Radiographic spinal alignment	Subluxation / translation 		De novo deformity Kyphosis/scoliosis 		Normal alignment 
Vertebral body collapse		>50% collapse 	<50% collapse 	No collapse, >50% body involved 	None 
Posterolateral involvement of the spinal elements		Bilateral 		Unilateral 	None 

illustrated items of the SINS by Wouter Foppen MD PhD, Sander P J Muijs MD PhD, Jorrit-Jan Verlaan MD PhD, and Charles G Fisher MD MHSc based on the original SINS publication: Fisher CG, et al. Spine 2010. doi: 10.1097/BRS.0b013e3181e16ae2


A
„intra"-vertebral onset
circuferential growth
posterior wall bulging or breakthrough
radiation induced bone scleoris
vertebral body collapse
B
„inter"-vertebral onset
abcess formation
osteronecrosis with anterior defect
kyphotic misalignement

Clasificaciones con intención pronóstica

European Spine Journal
https://doi.org/10.1007/s00586-018-5775-x

ORIGINAL ARTICLE

Predicting the need for surgical intervention in patients with spondylodiscitis: the Brighton Spondylodiscitis Score (BSDS)

Nageswary Appalanaidu[1] · Roozbeh Shafafy[1] · Christopher Gee[1] · Kit Brogan[1] · Shuaib Karmani[1] · Giuseppe Morassi[1] · Sherief Elsayed[1]

Poca claridad en cuanto a inestabilidad vertebral
No incluye TC, más sensible para detectar destrucción del cuerpo vertebral

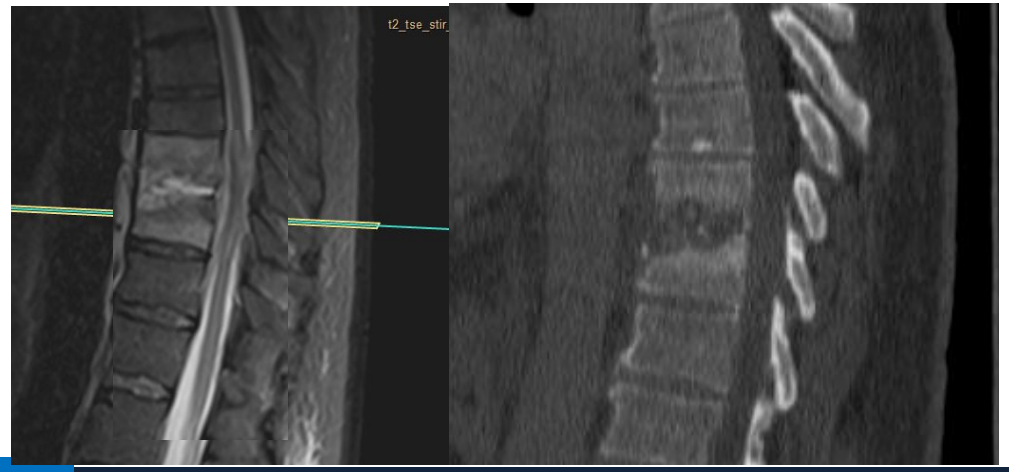
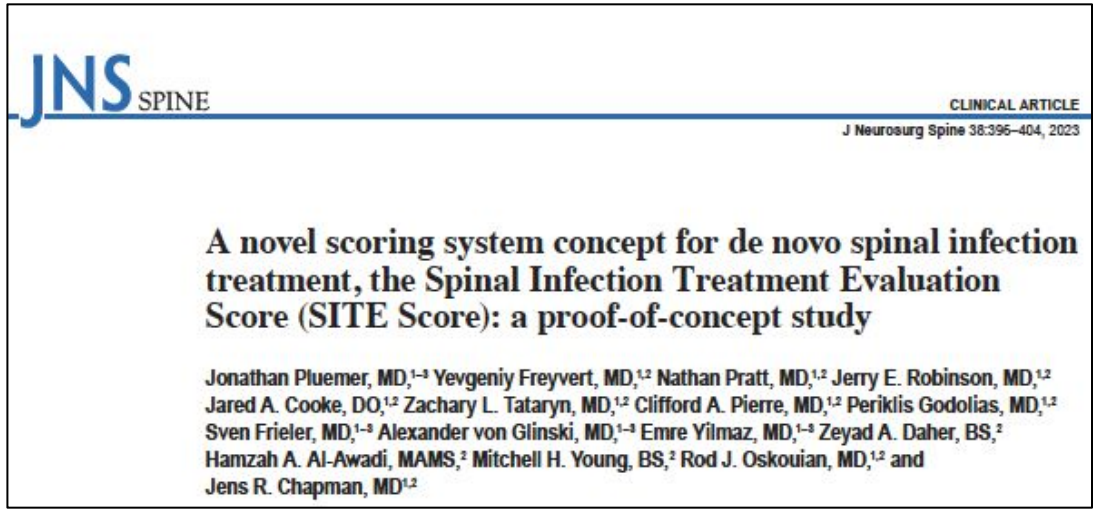


Table 4 Brighton Spondylodiscitis Score (BSDS)

Predictors	Relative Score	Risk of requiring surgery
Distant site infection	1	Low: 7–14
None	3	Moderate: 15–20
UTI/pneumonia	5	High: 21–33
Endocarditis	6	
Sepsis		
Comorbidities	1	
None	3	
IVDU	5	
Diabetes mellitus		
Immunocompromised	1	
None	4	
Metastatic cancers	6	
Dialysis		
MRI Findings	1	
None	2	
Non-specific fluid collection	4	
Vertebral collapse	5	
Abscess formation		
Anatomical location	1	
Cervical	3	
Lumbosacral	5	
Thoracolumbar		
Neurology on presentation	1	
None	2	
Motor/sensory	3	
Complete		

Clasificaciones con intención pronóstica



JNS SPINE

CLINICAL ARTICLE

J Neurosurg Spine 38:396–404, 2023

A novel scoring system concept for de novo spinal infection treatment, the Spinal Infection Treatment Evaluation Score (SITE Score): a proof-of-concept study

Jonathan Pluemer, MD,[1–3] Yevgeniy Freyvert, MD,[1,2] Nathan Pratt, MD,[1,2] Jerry E. Robinson, MD,[1,2] Jared A. Cooke, DO,[1,2] Zachary L. Tataryn, MD,[1,2] Clifford A. Pierre, MD,[1,2] Periklis Godolias, MD,[1,2] Sven Frieler, MD,[1–3] Alexander von Glinski, MD,[1–3] Emre Yilmaz, MD,[1–3] Zeyad A. Daher, BS,[2] Hamzah A. Al-Awadi, MAMS,[2] Mitchell H. Young, BS,[2] Rod J. Oskouian, MD,[1,2] and Jens R. Chapman, MD[1,2]

Da más valor al TC, erosion de los platillos
Valora angulación de los platillos

TABLE 2. The SITE Score

Variable	Score
1) Neurology	
Acute plegia OR bladder/bowel dysfunction	Surgery
Motor dysfunction	1
Sensory dysfunction	2
Neurologically intact	3
2) Location	
Junctional (occiput–C2, C7–T2, T11–L1, L5–S1)	1
Mobile (C3–6, L2–4)	2
Semirigid (T3–10)	3
Rigid (S2–5)	4
3) Radiology	
Spinal canal stenosis w/ impingement of central neural elements w/ or w/o de novo deformity	1
Segmental angulation or translation w/ de novo deformity/foraminal stenosis OR erosion of vertebral body on CT >50% OR PL involvement on both sides	2
Visible endplate erosion on CT OR edema of vertebral body >50% on MRI OR intervertebral disc involvement on MRI OR PL involvement on 1 side	3
None of these radiological findings	5
4) Pain	
Standing axial pain OR inability to ambulate	0
Other pain w/ the ability to ambulate	1
No pain	2
5) Host comorbidities	
IVDA OR diabetes mellitus	0
Other comorbidities OR no comorbidities	1
SITE Score treatment group	**Overall Score**
Severe spinal infection w/ high probability of instability or neural element impingement; surgery recommended	0–8
Moderate spinal infection, moderate risk of instability or neural element impingement; medical treatment recommended, surgical treatment optional	9–12
Mild spinal infection, mild to no risk of instability or neural element impingement; medical treatment recommended	13–15

PL = posterolateral.

Original Research

AO SPINE

Global Spine Journal
2026, Vol. 0(0) 1-7
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Sage

The Modified Spinal Instability Spondylodiscitis Score (mSISS): Adaptation and Validation of a Novel Classification System for Spinal Instability in Spondylodiscitis

Friederike Schömig, MD[1], Nima Taheri, MD[1], Mohammed El-Sharkawi, MD[2], Mohamed M. Aly, MD[3,4], Ratko Yurac, MD[5], Gaston Camino Willhuber, MD[6], Charlotte Dandurand, MD[7], Martin Holas, MD[8], Harvinder Singh Chhabra, MD[9], Klaus Schnake, MD[10,11], Maximilian Reinhold, MD[12], Andrei F. Joaquim, MD[13], Gregory D. Schroeder, MD[14], Claudius Thomé, MD[15], Julian Scherer, MD[16], Eugen Cezar Popescu, MD[17], Ulrich J.A. Spiegl, MD[18], Sebastian F. Bigdon, MD[19], Richard Bransford, MD[20], and Matthias Pumberger, MD[1]

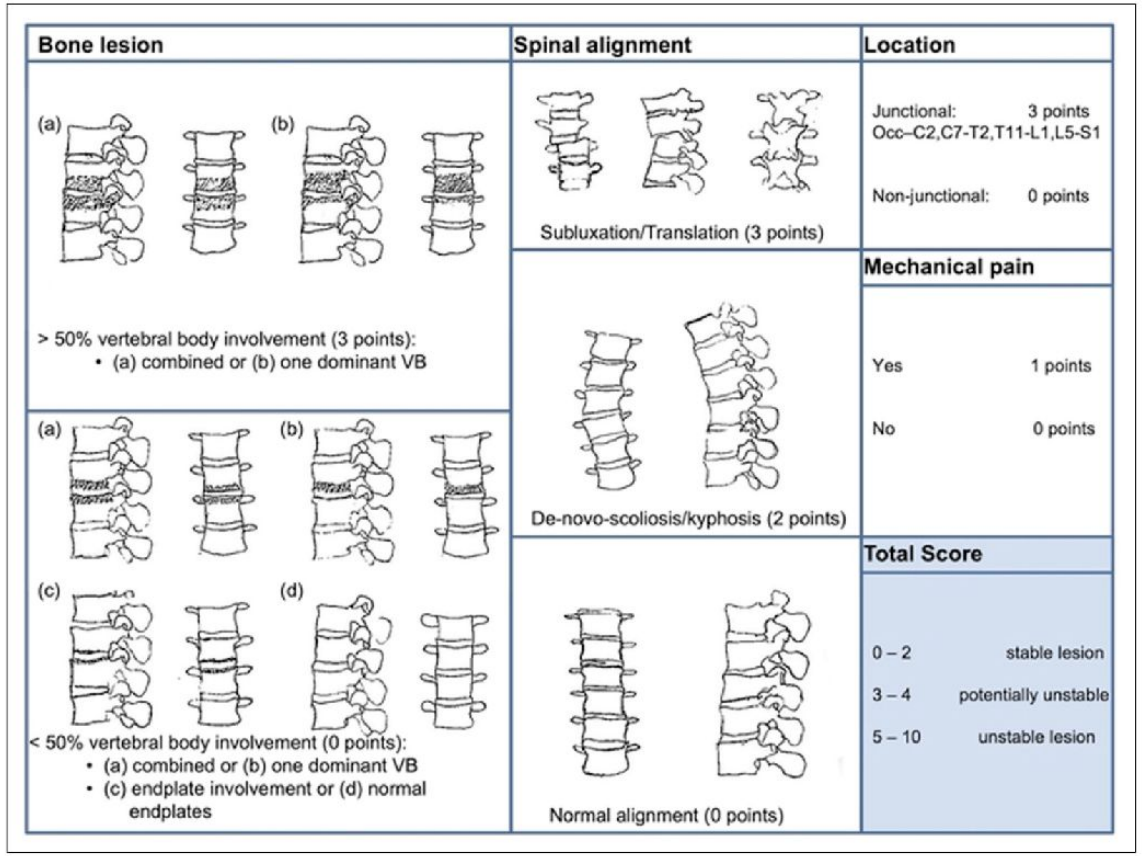


Figure 2. Depiction of the parameters of the mSISS which was used in training the raters

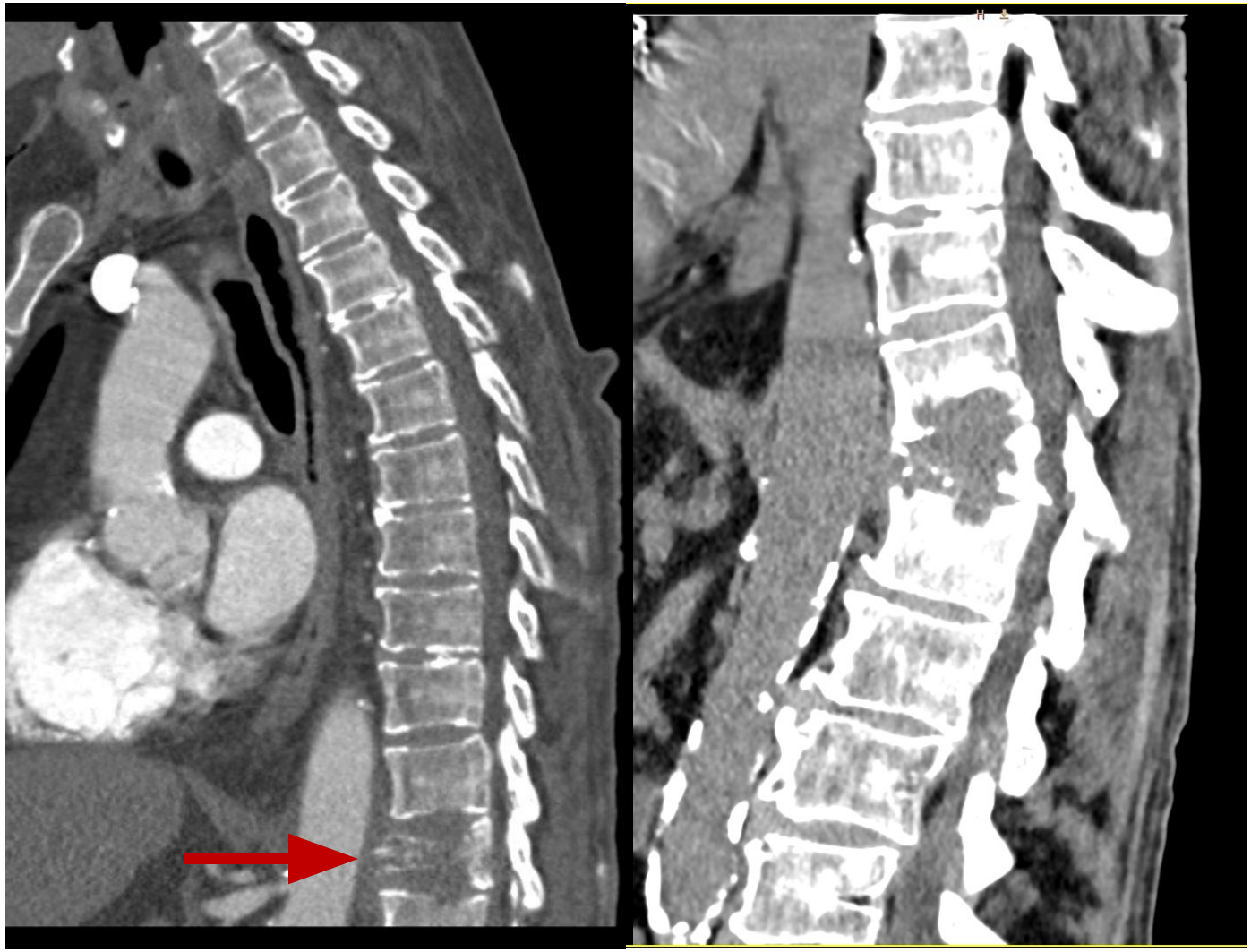
Fijación en caso de inestabilidad









67 años, ca renal con nefrostomía, hepatocarcinoma de novo, cifosis progresiva

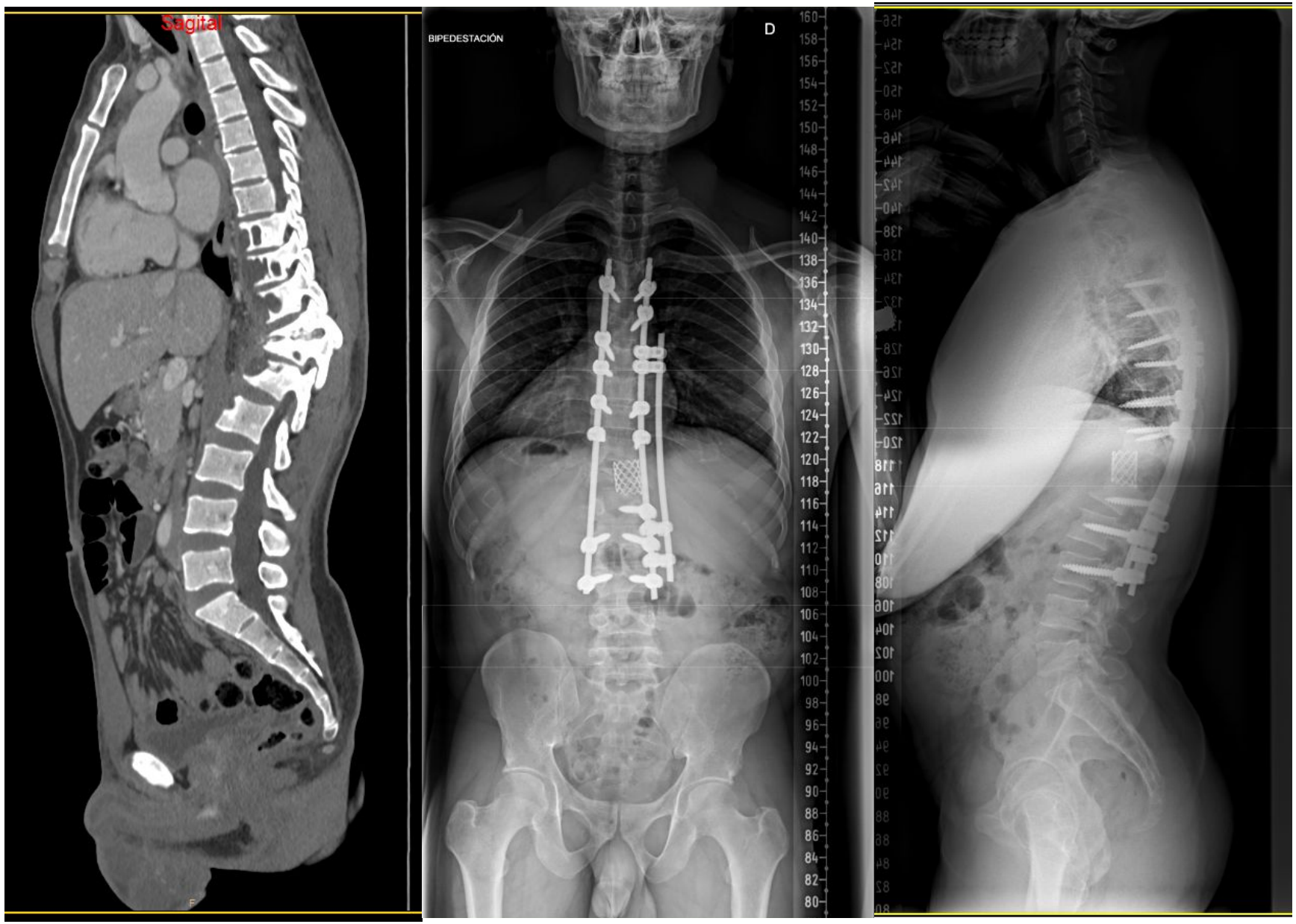




No aumento de cifosis en bipedestación vs supino

Reconstrucción de deformidades



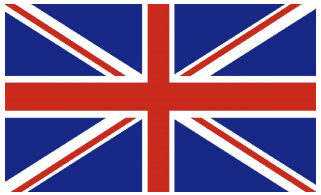

Sagital
BIPEDESTACIÓN
D

OPEN

Comparing Conservative and Early Surgical Treatments for Pyogenic Spondylodiskitis: An International Propensity Score–Matched Retrospective Outcome Analysis

Jonathan Neuhoff, MD, Andreas Kramer, MD, Santhosh G. Thavarajasingam, MD, Rebecca K. Sutherland, MD, Hugh McCaughan, MD, Ann-Kathrin Joerger, MD, Maria Wostrack, MD, Barrie Lyell, MBChB, Olga Berkulian, MD, Hariharan Subbiah Ponniah, Daniele S. C. Ramsay, Bernhard Meyer, MD, Frank Kandziora, MD, Ehab Shiban, MD, Benjamin Davies, MD, Andreas K. Demetriades, MD, Florian Ringel, MD

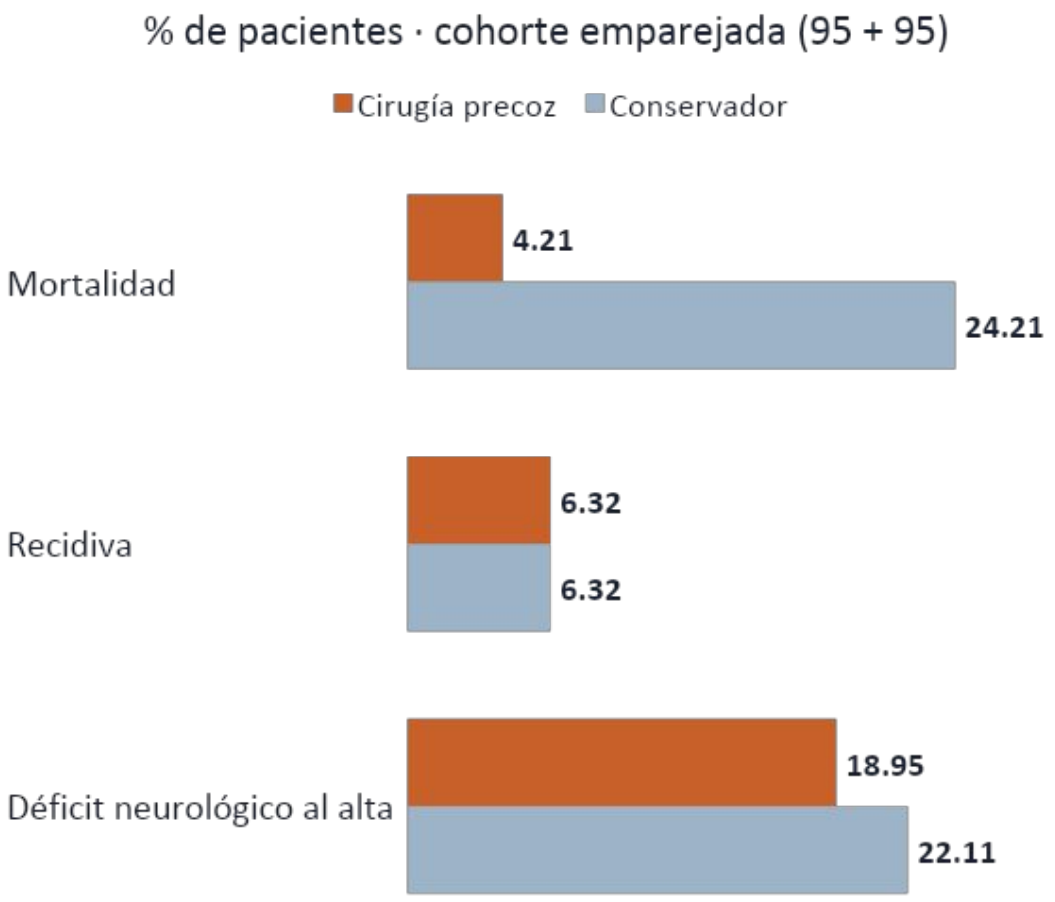
85% de pacientes tratados conservadoramente

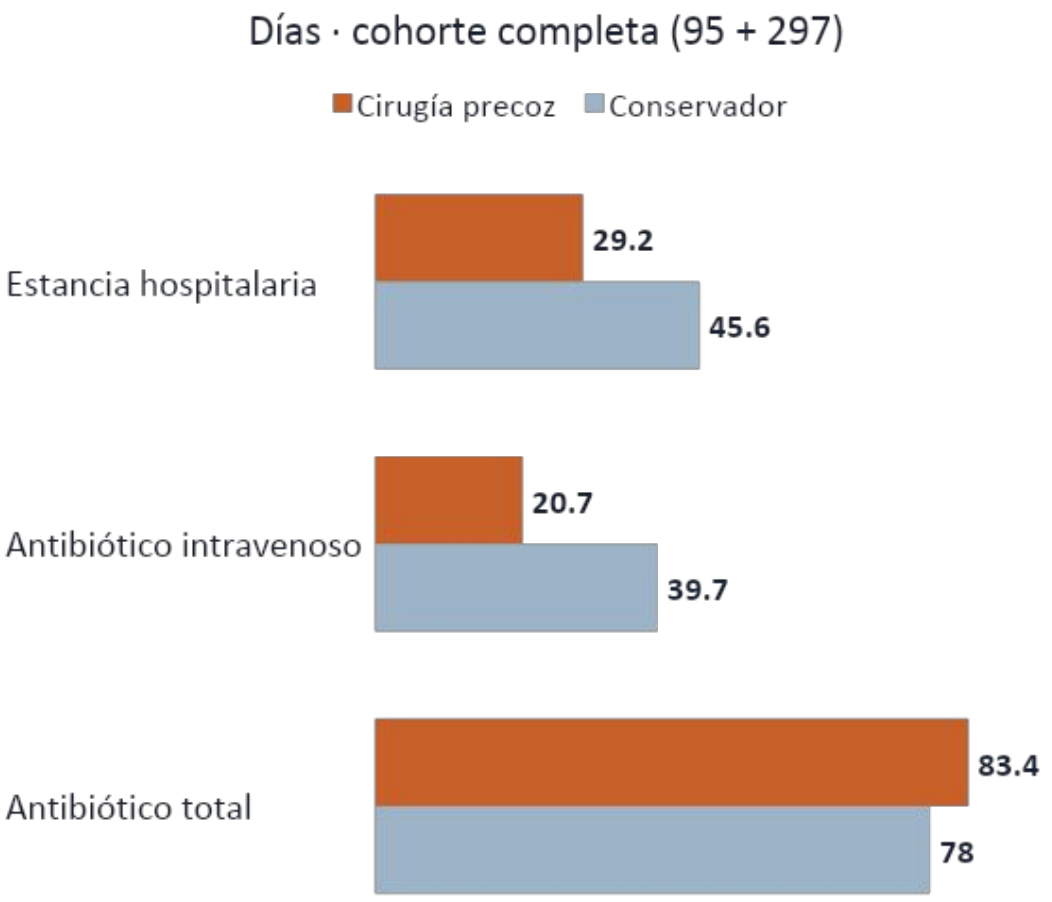


98% de pacientes intervenidos



Resultados de tratamiento





Neuhoff 2024 *Neurosurgery*

Resultados de tratamiento

scientific reports

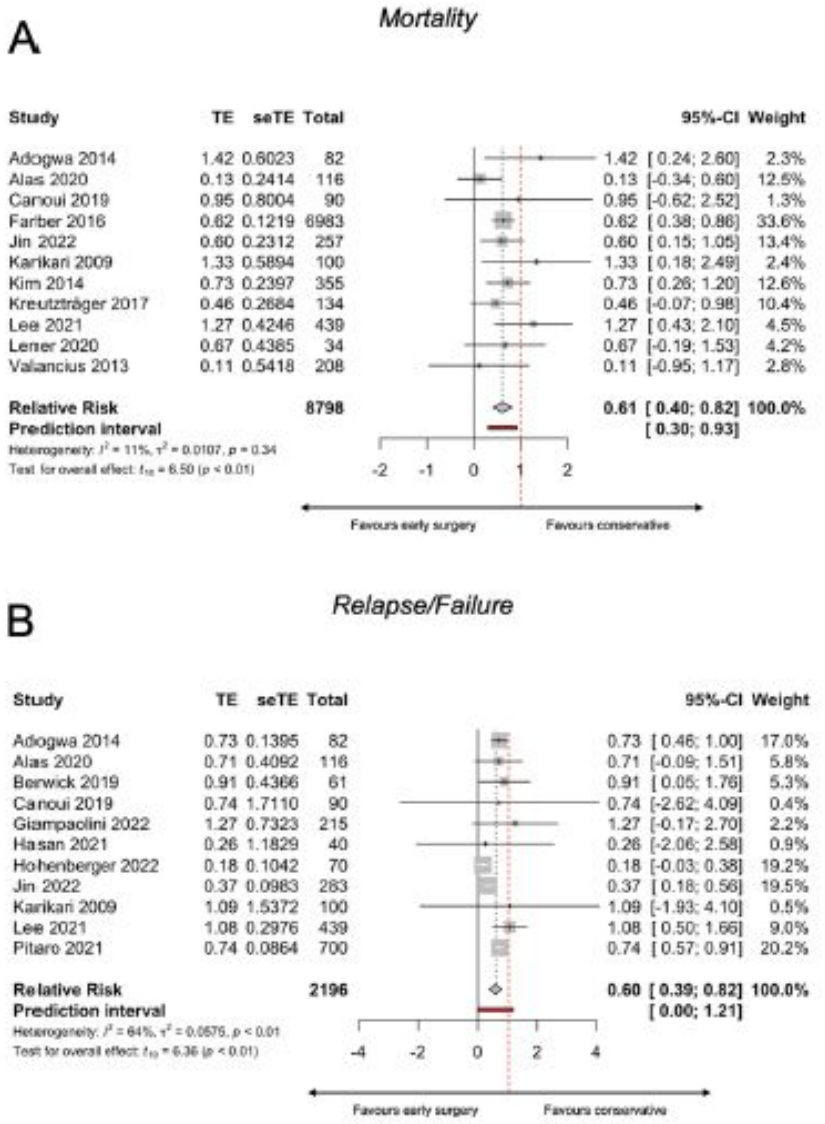
Check for updates

OPEN

Conservative versus early surgical treatment in the management of pyogenic spondylodiscitis: a systematic review and meta-analysis

Santhosh G. Thavarajasingam[1,2,3,9,10]✉, Kalyan V. Vemulapalli[1,3], Sajeenth Vishnu K.[1,3], Hariharan Subbiah Ponniah[1,3], Alexander Sanchez-Maroto Vogel[3,4], Robert Vardanyan[1,2,3], Jonathan Neuhoff[5,9], Andreas Kramer[6,9], Ehab Shiban[7,9], Florian Ringel[6,9], Andreas K. Demetriades[8,9] & Benjamin M. Davies[2,9]

- 93% de los pacientes (>10000) provienen de un único registro que evalúa laminectomía en pacientes con absceso epidural



Resultados de tratamiento

Journal of Clinical Medicine

MDPI

Systematic Review

Is Conservative Treatment Superior to Surgical Intervention in Hematogenous Primary Septic Spinal Infection in Terms of Mortality, Recurrence, and Hospital Stay? A Systematic Review and Meta-Analysis

Panagiotis Korovessis [1,*], Vasileios Syrimpeis [1] and Georgios Dimakopoulos [2]

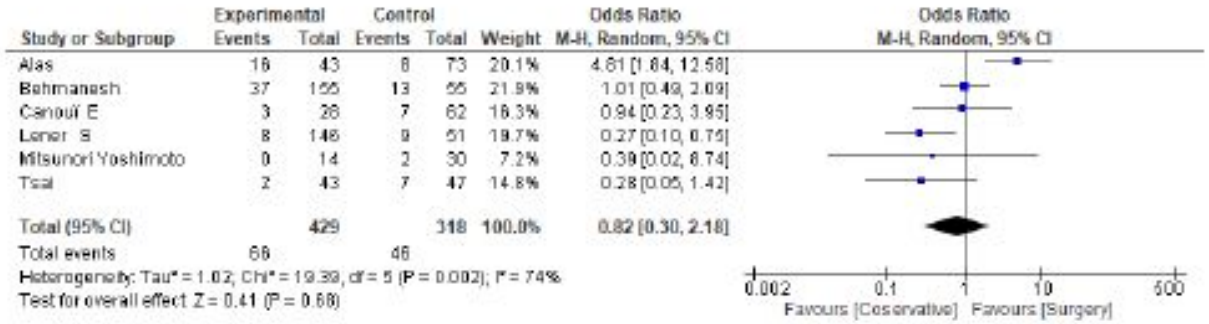


Figure 2. Mortality forest plot [26,30–33,56].

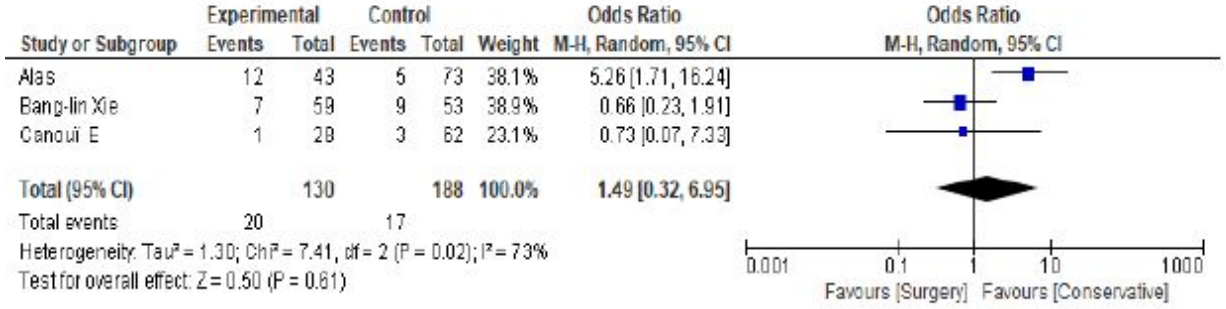


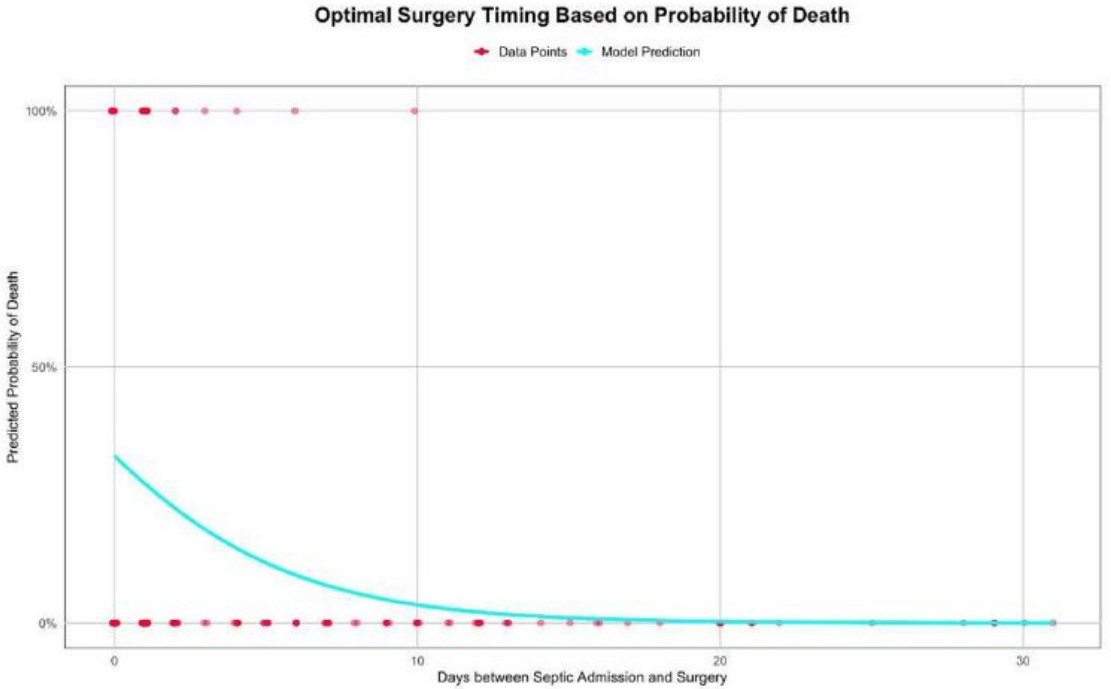
Figure 3. Recurrence forest plot [31,32,58].

The Spine Journal 25 (2025) 876–885

Clinical Study

Management of severe pyogenic spinal infections: the 2SICK study by the EANS spine section

Andreas Kramer, MD[a,*], Santhosh G. Thavarajasingam, MD[a,c], Jonathan Neuhoff, MD[b], Felipa Lange[a], Hariharan Subbiah Ponniah[c], Sara Lener, MD, PhD, PD[d], Claudius Thomé, MD[d], Felix C. Stengel, MD[e], Gregor Fischer, MD[e], Isabel C. Hostettler, MD, PhD, PD[e], Martin N. Stienen, MD, PD[e], Maxim Jemna[f], Konstantinos Gousias, MD[g], Aleksandra Nedeljkovic, MD[h], Danica Grujicic, MD[h], Zarko Nedeljkovic, MD[h], Jasmina Poluga, MD, PhD[i], Ralph T. Schär[j], Wiktor Urbanski, MD, PD[k], Carla Sousa, MD[l], Carlos Daniel Oliveira Casimiro, MD[l], Helena Harmer, MD[m], Barbara Ladisich, MD, PhD[m], Matthias Matt, MD[n], Matthias Simon, MD[n], Delin Pai, MD[o], Christian Doenitz, MD[o], Lorenzo Mongardi, MD[p], Giorgio Lofrese, MD, PhD[p], Melanie Buchta, MD[q], Lukas Grassner, MD, PhD, PD[q], Pavel Trávníček, MD[r], Tomáš Hosszú, MD, PhD[r], Maarten Wissels, MD[s], Sven Bamps, MD[s], Waeel Hamouda, MD, PhD[t,u], Flavio Panico, MD[v], Diego Garbossa, MD[v], Marcello Barbato, MD[w], Manlio Barbarisi, MD, PhD[w], Tobias Pantel, MD[x], Jens Gempt, MD[x], Tharaka Sai Kasula[y], Sohum Desai, MD[y], Julius Mautin Vitowanu, MD[z], Bekir Rovčanin, MD[aa], Ibrahim Omerhodzic, MD[aa], Andreas K. Demetriades, MD, MBBChir[bb], Benjamin Davies, MD, MRCS[cc], Ehab Shiban, MD[dd], Florian Ringel, MD[a]



'Critically ill' patients were defined by the presence of two out of four Systemic Inflammatory Response Syndrome (SIRS) criteria (fever above 38°C or below 36°C, heart rate over 90 beats per minute, respiratory rate over 20 breaths per minute, or abnormal white blood cell count) or an initial CRP level of ≥200 mg/l. These criteria served as the study's inclusion criteria.

Treatment_Group	Count	Ones	Percentage	Variable
Conservative	36	10	27.78	Death
Delayed_Surgery	74	3	4.05	Death
Early_Surgery	79	22	27.85	Death
Conservative	32	1	3.12	Relapse_of_Spondylodiscitis
Delayed_Surgery	73	8	10.96	Relapse_of_Spondylodiscitis
Early_Surgery	77	18	23.38	Relapse_of_Spondylodiscitis

Supplemental Table 4: Descriptive summary statistics of categorical outcome variables.

Resultados de tratamiento

Review > J Neurosurg Sci. 2017 Feb;61(1):64-76. doi: 10.23736/S0390-5616.16.03302-6.
Epub 2015 Apr 15.

Instrumented fusion in the setting of primary spinal infection

Rafael DE LA Garza-Ramos [1], Mohamad Bydon, Mohamed Macki, Nicholas B Abt, Jay Rhee, Ziya L Gokaslan, Ali Bydon

Revisión sistemática de la literatura 951 casos incluidos

- 4.7% infección postoperatoria de la herida
- 1.6% recidivas
- 4.5% reintervenciones
- 2.35 mortalidad

Conclusiones

- Es muy difícil conseguir evidencia de calidad: diferentes tipos de lesiones e intervenciones. Sesgos de selección
- Es posible que el tratamiento quirúrgico tenga algunas ventajas frente al conservador (recuperación más rápida, ¿mortalidad?)
- Por el momento tendremos que seguir tomando decisiones individualizadas teniendo en cuenta sobre todo los criterios de inestabilidad y la situación global del paciente y valorando las posibles ventajas de la cirugía