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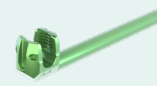
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ÍNDICE

A RANDOMIZED CONTROLLED TRIAL USING EPIDURAL ANALGESIA FOR PAIN RELIEF AFTER LUMBAR INTERLAMINAR DECOMPRESSIVE SPINE SURGERY: THE RAPID TRIAL

Hermans SMM, Lantinga-Zee AAG, Droeghaag R, Van Santbrink H, Van Hemert WLW, Reinders MK, Hoofwijk DMN, Van Kuijk SMJ, Rijkers K, Curfs I

RESUMEN (ABSTRACT)

Study design: Prospective, double-blind randomized controlled trial.

Objective: If an intraoperative single bolus of epidural bupivacaine can result in less postoperative pain following lumbar spinal decompression surgery.

Summary of background data: Adequate postoperative pain management following lumbar spinal decompression surgery is important, as it will lead to early mobilization, less complications, and a shorter hospital stay. Opioid consumption should be limited due to their frequently accompanied side effects and their addictive nature. During the final phase of lumbar decompression surgery, the epidural space becomes easily accessible. This might be an ideal moment for surgeons to administer an epidural bolus of analgesia as a safe and effective method for postoperative pain relief.

Materials and methods: In this trial, we compared a single intraoperative bolus of epidural analgesia using bupivacaine 0.25% to placebo (NaCl 0.9%) and its effect on postoperative pain following lumbar spinal decompression surgery. The primary outcome was the difference in Numeric (Pain) Rating Scale between the intervention and placebo groups during the first 48 hours after surgery.

Results: Both the intervention group and the placebo group consisted of 20 randomized patients (N= 40). Statistically significant lower mean Numeric (Pain) Rating Scale pain scores were observed in the intervention group in comparison with the control group (main effect group: -2.35±0.77, P= 0.004). The average pain score was lower in the intervention group at all postoperative time points. No study-related complications occurred.

Conclusion: This randomized controlled trial shows that administrating a bolus of intraoperative epidural bupivacaine is a safe and effective method for reducing early postoperative pain following lumbar decompression surgery.

COMENTARIO

Se trata de un estudio aleatorizado doble ciego en un pequeño grupo de pacientes para comparar la eficacia de la administración epidural de bupivacaína después de la descompresión lumbar en comparación con un grupo control.

RESULTADOS

Los autores encontraron diferencias clínicamente relevantes y estadísticamente significativas mostrando superioridad del grupo de estudio respecto al grupo control.

RELEVANCIA CLÍNICA

Según los resultados presentados, con un pequeño gesto accesible a cualquier cirujano y con un coste mínimo se puede reducir de manera significativa el dolor postoperatorio en pacientes sometidos a cirugía de descompresión lumbar.

SAGITTAL ALIGNMENT IN THE DEGENERATIVE LUMBAR SPINE: SURGICAL PLANNING

Diebo BG, Balmaceno-Criss M, Lafage R, McDonald CL, Alsoof D, Halayqeh S, DiSilvestro KJ, Kuris EO, Lafage V, Daniels AH

RESUMEN (ABSTRACT)

Sagittal alignment of the spine has gained attention in the field of spinal deformity surgery for decades. However, emerging data support the importance of restoring segmental lumbar lordosis and lumbar spinal shape according to the pelvic morphology when surgically addressing degenerative lumbar pathologies such as degenerative disc disease and spondylolisthesis.

The distribution of caudal lordosis (L4-S1) and cranial lordosis (L1-L4) as a percentage of global lordosis varies by pelvic incidence (PI), with cephalad lordosis increasing its contribution to total lordosis as PI increases.

Spinal fusion may lead to iatrogenic deformity if performed without attention to lordosis magnitude and location in the lumbar spine.

A solid foundation of knowledge with regard to optimal spinal sagittal alignment is beneficial when performing spinal r spinal surgery, and thoughtful planning and execution of lumbar fusions with a focus on alignment may improve patient outcomes.

COMENTARIO

Se trata de un artículo descriptivo y de revisión de la literatura en el que resalta la importancia del análisis de la deformidad en el plano sagital a la hora de planificar y ejecutar cirugía de fusión lumbar.

RESULTADOS

Según describen los autores, un detallado análisis y cuidadosa planificación de la distribución de la lordosis lumbar va a ayudar a obtener mejores resultados clínicos a corto y largo plazo.

RELEVANCIA CLÍNICA

Este artículo hace una descripción muy completa de las principales variables en el plano sagital que se relacionan con mejores resultados en cuanto a la calidad de vida haciendo especial hincapié en la patología degenerativa. Lo más relevante de este artículo de revisión consiste en que se centra en artrodesis lumbares cortas, que es la patología que con más frecuencia tienen que tratar los cirujanos de columna y no en casos de grandes deformidades que constituyen un pequeño porcentaje de la práctica clínica habitual.

COMPARISON OF FOUR NUTRITIONAL SCREENING TOOLS FOR PREDICTING POSTOPERATIVE ADVERSE EVENTS FOLLOWING DEGENERATIVE SPINAL DEFORMITY SURGERY

Wang SK, Li J, Wang P, Li XY, Kong C, Ma J, Lu SB

RESUMEN (ABSTRACT)

Study design: A retrospective study.

Objective: To compare the mini nutritional assessment-short form (MNA-SF), geriatric nutritional risk index, prognostic nutritional index (PNI), and preoperative serum albumin level as predictors of postoperative adverse events (AEs) in degenerative spine deformity (DSD) patients.

Summary of background data: Although various nutritional screening tools have been well evaluated in patients undergoing spinal fusion surgery, the most suitable tool for the DSD population remains uncertain at present.

Patients and methods: The authors reviewed consecutive patients who underwent thoracolumbar fusion surgery for DSD between August 2016 and May 2023. Four screening tools were used to assess preoperative nutritional status. Patients were divided into two categories according to each screening tool, and the four screening tools were compared regarding their predictive power for postoperative AEs, including the rates of extended length of hospital stays (LOS), complications, and readmission within three months. Physical functional indicators such as time to first ambulation, nonhome discharge, and postoperative LOS were assessed as secondary outcome measures. A multivariable logistic regression analysis was used to identify factors associated with postoperative AEs.

Results: A total of 228 patients were included. The demographic characteristics, underlying disease, and magnitude of correction were not significantly different between well-nourished and malnourished groups. The nutritional risks shown by MNA-SF and albumin level were significantly associated with infectious complications (P <0.05). The nutritional risk shown by MNA-SF was significantly associated with nonhome discharge, prolonged postoperative LOS (12.5±8.2 vs. 10.3±6.1, P= 0.039), and delayed ambulation (3.7±2.1 vs. 2.2±1.8, P= 0.001). Multivariable logistic regression revealed that PNI <50 was significantly associated with total AEs and minor AEs after DSD surgery.

Conclusions: PNI was significantly associated with the incidence of total AEs and minor AEs, while preoperative albumin level and MNA-SF were more effective in predicting postoperative infectious complications and delayed recovery of physical function, respectively.

RELEVANCIA CLÍNICA

El estado nutricional del paciente debe ser evaluado obligatoriamente de forma preoperatoria en todos los pacientes con comorbilidades como parte esencial del diagnóstico y la toma de decisiones. El adecuado estudio análisis nutricional permitirá, además, una mejor optimización de los pacientes que van a ser sometidos a cirugía de deformidad.

CAN DISCHARGE RADIOGRAPHS PREDICT JUNCTIONAL COMPLICATIONS? A DECISION TREE ANALYSIS

Lovecchio F, Lafage R, Sheikh Alshabab B, Shah S, Punyala A, Ang B, Akosman I, Charles Elysee J, Lafage V, Schwab F, Kim HJ

RESUMEN (ABSTRACT)

Study design: Retrospective cohort study.

Objectives: To determine if standing pre-discharge radiographs can predict the development of junctional complications.

Materials and methods: Adult spinal deformity patients who underwent fusion of the lumbar spine (≥5 levels, LIV pelvis) were included. All patients underwent full-length standing radiographs before hospital discharge. Outcomes of interest included 2-year radiographic PJK and proximal junctional failure (PJF). Patients were stratified into 3 exclusive groups: No PJK, PJK, and PJF. Chi-square automatic interaction detection (CHAID) decision tree analysis was utilized to identify pre-discharge proximal junctional angle (PJA) thresholds associated with increased risk of PJK or PJF.

Results: The 117 study patients had a mean age 65.8 ± 8.5, BMI 27.2 ± 4.9, PI-LL 23.3 ± 17.4, TPA 27.2 ± 11.5. Sample was stratified into 64 (54.7%) No PJK, 39 (33.3%) PJK, 14 (12.0%) PJF. No differences were detected between cohorts in discharge alignment, preop-discharge change, or offset from age-adjusted alignment targets (P >.005). Decision tree analysis showed that the first branch point depended on the UIV, as most patients with an UT UIV did not develop PJK or PJF (no PJK, 67.4%). For patients with an LT UIV, a second branch point occurred based on the ΔPJA. 89.5% of LT patients with a ΔPJA <4.3° were free of radiographic PJK and PJF. The third branch point occurred based on the PJA at discharge. Thus, the highest risk group was comprised of ΔPJA ≥4.3° and PJA >15.5°, as 57.1% of developed PJF and 28.6% PJK.

Conclusion: Most patients with a lower thoracic UIV, preop-discharge ΔPJA ≥4.3°, and discharge PJA >15.5° develop PJF.

COMENTARIO

En este estudio de cohortes retrospectivos se analizaron los factores de riesgo para desarrollar cifosis de unión proximal detectables en la primera telerradiografía lateral hecha antes del alta a los pacientes sometidos a cirugía de deformidad del adulto. En todos los pacientes estudiados se realizó fusión a pelvis.

RESULTADOS

Encontraron como factores de riesgo para desarrollar fallo de unión proximal fueron: vértebra más proximal instrumentada T8 o más caudal, incremento de ángulo de cifosis proximal >4'3° y ángulo de unión proximal >15'5°. Los pacientes con los 3 factores de riesgo supusieron el 70% de los que desarrollarían complicaciones de unión proximal.

RELEVANCIA CLÍNICA

Con una incidencia de entre el 20 y 50% de los pacientes sometidos a cirugía de deformidad del adulto, las complicaciones de la unión proximal son una de las principales preocupaciones para el cirujano de columna. Este estudio sugiere la posibilidad de tomar medidas preventivas o un seguimiento más estrecho en los pacientes del grupo de riesgo. Aporta también información útil para la planificación quirúrgica.

COMPLICATIONS AND OUTCOMES AFTER THREE-COLUMN OSTEOTOMY: A 5-YEAR FOLLOW-UP

Corbett AN, Adeniyi B, Simonetta BA, Crandall DG, Chang MS

RESUMEN (ABSTRACT)

Background: Three-column spinal osteotomies (3-CO) are powerful techniques used to correct spinal deformity. These surgeries are associated with an elevated risk of complications. While outcomes have been reported in the literature with 2 years follow-up, longer-term outcomes of three-column osteotomies remain understudied.

Objectives: This study aims to examine patient reported outcomes and complications for three-column osteotomies at 5 years.

Study design: Retrospective review of a prospectively collected spinal deformity cases database.

Patient sample: All consecutive adult patients at a single spine surgery center treated with either a pedicle subtraction osteotomy (PSO) or vertebral column resection (VCR) for spinal deformity, and with a minimum 5-year follow-up were included.

Outcome measures: Visual-analog scale (VAS) for back pain score [0 to 10], Oswestry Disability Index (ODI) score [0 to 100], number of complications, revision rate, sagittal balance, lumbar lordosis at preoperative and at 5-year visit.

Methods: Data was extracted from a prospectively collected spinal deformity surgery database continuously updated since 2002 with data from operative reports, patients' medical visit notes and patients' self-reported VAS and ODI questionnaires completed at each office visit. Radiographic measurements were performed on standing full-length spine radiographs taken at pre-op and 5Yr visits. Descriptive statistics, comparison of means and proportions among groups, and a logistic regression analysis were conducted using the statistical software package SPSS version 28. Statistical significance was set at $p < 0.05$.

Results: 127 consecutive adult patients with minimum of 5-year follow-up undergoing a 3-CO posterior spinal surgery for spinal deformity were identified and included in the study, 79 (62%) were treated with PSO, and 48 (38%) with VCR. Both PSO and VCR groups demonstrated significant improvements in VAS (PSO pre-op: 6.7, 5Yr: 4.6, $p<0.001$; VCR pre-op: 7.1, 5Yr: 5.2, $p<0.001$), and ODI (PSO pre-op: 52.9, 5Yr: 45.4, $p<0.001$; VCR pre-op: 57.5, 5Yr 43.0, $p<0.001$) that were maintained at 5 years. Major and minor complications occurring within 5 years were not statistically different between the PSO and VCR groups (major: 59.5% vs 56.3%, $p= 0.85$; minor: 45.6% vs 37.5%, $p= 0.46$). The rate of revision surgery within 5 years was 39.4% overall. Of the fifty patients requiring revision, 37.5% were for nonunion, 27.1% instrumentation failure, 14.6% proximal junctional kyphosis (PJK), 12.5% vertebral fracture, 6.3% motor weakness, and 2.1% infection. Improvements in lumbar lordosis were maintained at 5 years in both the PSO (29.9° vs 47.2°, $p <0.001$) and VCR (34.6° vs 48.5°, $p <0.001$) groups while sagittal balance maintained significant improvement in the VCR group (9.5 cm vs 6.3 cm, $p= 0.008$) but not the PSO (11.4 cm vs 9.3 cm, $p= 0.065$).

Conclusion: Patients undergoing three-column osteotomies had a major complication rate of 57.5% and a minor complication rate of 42.5% after 5 years. Improvements in lumbar lordosis were maintained at 5-year follow-up, but sagittal balance was only maintained in the VCR group. Despite these radiographic findings, both VCR and PSO groups maintained significant clinical improvements in both VAS and ODI scores at 5-year follow up.

Keywords: Deformity; Long-Term Outcomes; Osteotomy; Pedicle Subtraction Osteotomy (PSO); Radiographic Outcomes; Three-Column Osteotomy (3-CO); Vertebral Column Resection (VCR).

COMENTARIO

Estudio de cohortes retrospectivo en un solo centro de más de 100 pacientes en el que se analizó la tasa de complicaciones y los factores de riesgo para desarrollarlas en dos cohortes de pacientes en los que se realizó osteotomía de las tres columnas para corrección de deformidad del adulto.

RESULTADOS

Los pacientes sometidos a osteotomía tricolumnar tuvieron una tasa de complicaciones mayores del 57.5% y una tasa de complicaciones menores del 42.5% en seguimiento a 5 años. Las mejoras en la lordosis lumbar se mantuvieron en el seguimiento de 5 años en los dos grupos, pero el equilibrio sagital solo se mantuvo en el grupo VCR. A pesar de estos hallazgos radiográficos, ambos grupos VCR y PSO obtuvieron mejoría clínicas significativas en las puntuaciones de VAS y ODI tras la cirugía que se mantuvo al final del seguimiento a 5 años.

RELEVANCIA CLÍNICA

En este estudio hay que tomar con cautela los resultados que comparan el grupo de osteotomía de sustracción con el grupo de vertebrectomía ya que ambos grupos no eran homogéneos y la tasa de complicaciones descrita puede llevar a pensar que el riesgo de complicaciones es similar en ambos tipos de osteotomía. Esto sería, a nuestro juicio, una interpretación incorrecta. Resulta sin embargo interesante la descripción de los factores de riesgo y las complicaciones más frecuentes en este tipo de cirugía. Tanto la bibliografía como la discusión resultan también de gran utilidad.

ADOLESCENT IDIOPATHIC SCOLIOSIS: IS THERE A RELATIONSHIP BETWEEN RISSER STAGING AND THE PROXIMAL HUMERUS OSSIFICATION SYSTEM?

Julián C, Ricardo DN, Rodrigo R, A TC, Lucas P, Eduardo G, Pablo AJ, Mariano N

RESUMEN (ABSTRACT)

Purpose: To evaluate whether there is a mismatch between Risser staging and the proximal humerus ossification system (PHOS); and to analyze the correlation in the skeletal maturity stages between the two humeral epiphyses.

Methods: Data from patients aged 10 to 18 years with adolescent idiopathic scoliosis (AIS) seen between 2018 to 2021 were analyzed. In an anteroposterior (AP) spine radiograph the ossification process was evaluated using the Risser classification method and bilateral PHOS (if both humeral epiphyses were visualized). A mismatch between methods was defined as a Risser 0-1 (relatively skeletally immature) with a PHOS 4-5 (skeletally mature), or a Risser 2-5 (relatively skeletally mature) with a PHOS 1-3 (skeletally immature). The McNemar test was used to calculate the significance of the mismatch.

Results: A mismatch between Risser and PHOS stages was observed in 28.5% of 105 patients, which was statistically significant (p <0.001). Of the 49 patients with a Risser 0-1, 55.1% (n= 27) had a PHOS 4-5. None of the patients with a Risser 2-5 had a PHOS 1-3. In the 47 patients in whom both humeri were visualized, the absolute correlation between the left and right PHOS values was 95.7%.

Conclusion: Of AIS patients who are relatively skeletally immature according to Risser staging, more than half may be skeletally mature when measured with PHOS. In patients with a Risser 0-1, it is recommended to measure skeletal maturity in an AP spine radiograph using the PHOS method, which may more accurately guide treatment decision-making, without the need to visualize both humeral epiphyses in this radiographic projection.

COMENTARIO

Se trata de un estudio retrospectivo comparativo en el que se analizaron más de 100 pacientes con escoliosis idiopática para evaluar la posible discordancia entre los estadíos de Risser y las fases de osificación del húmero proximal; y analizar la concordancia en los estadíos de maduración esquelética entre ambas epífisis humerales.

RESULTADOS

En 105 pacientes (95 mujeres y 10 varones) con edad promedio 13±1.6 años, la discordancia entre los estadios de Risser y PHOS fue de 28.5% y fue estadísticamente significativa (p <0.001). De los 49 pacientes con Risser 0-1, el 55.1% (n= 27) presentó PHOS de 4 o 5. Ningún paciente con Risser 2-5 presento PHOS 1-3. En los 47 pacientes en quienes se visualizó ambos húmeros, la concordancia absoluta en los valores del PHOS izquierdo y derecho fue de 95.7%.

RELEVANCIA CLÍNICA

El método de Risser es ampliamente usado para evaluar la madurez esquelética, ya que las crestas ilíacas, usualmente, se pueden observar en un espinograma de frente; y por su simpleza en la medición. Desafortunadamente, el sistema de osificación de las crestas ilíacas, es poco sensible en predecir el PHV, el comienzo de la osificación de las crestas (Risser 1), ocurre luego del período de máximo crecimiento.

El PHOS permite relacionar sus estadíos con el PHV y predecir el crecimiento remanente con la medición en un espinograma de frente, sin necesidad de una radiografía adicional de la mano. Con una baja variabilidad intra e inter observador, se disminuye de esta manera la exposición a radiación, costos y tiempo.

Además, se observó concordancia absoluta de 95.7% en los estadíos de maduración esquelética del PHOS entre el húmero izquierdo y derecho. Siendo suficiente observar solamente 1 de las epífisis humerales en el espinograma de frente.

En pacientes con EIA relativamente inmaduros por Risser, más de la mitad pueden tener madurez esquelética al medirlos con PHOS. Se recomienda en pacientes con Risser 0-1, medir en espinograma de frente la madurez esquelética con el método PHOS, lo cual puede guiar de manera más precisa el tratamiento adecuado, sin necesidad de visualizar ambas epífisis humerales en esta proyección radiológica.

INTRAOPERATIVE NAVIGATION INCREASES THE PROJECTED LIFETIME CANCER RISK IN PATIENTS UNDERGOING SURGERY FOR ADOLESCENT IDIOPATHIC SCOLIOSIS

Striano BM, Crawford AM, Verhofste BP, Hresko AM, Hedequist DJ, Schoenfeld AJ, Simpson AK

RESUMEN (ABSTRACT)

Background context: Adolescent idiopathic scoliosis (AIS) is a common condition, often requiring surgical correction. Computed tomography (CT) based navigation technologies, which rely on ionizing radiation, are increasingly being utilized for surgical treatment. Although this population is highly vulnerable to radiation, given their age and female predominance, there is little available information elucidating modeled iatrogenic cancer risk.

Purpose: To model lifetime cancer risk associated with the use of intraoperative CT-based navigation for surgical treatment of AIS.

Study design/setting: This retrospective cross-sectional study took place in a quaternary care academic pediatric hospital in the United States.

Patient sample: Adolescents aged 10-18 who underwent posterior spinal fusion for a diagnosis of AIS between July 2014 and December 2019.

Outcomes measures: Effective radiation dose and projected lifetime cancer risk associated with intraoperative doses of ionizing radiation.

Methods: Clinical and radiographic parameters were abstracted, including total radiation dose during surgery from flat plate radiographs, fluoroscopy, and intraoperative CT scans. Multivariable regression analysis was used to assess differences in radiation exposure between patients treated with conventional radiography versus intraoperative navigation. Radiation exposure was translated into lifetime cancer risk using well-established algorithms.

Results: In total, 245 patients were included, 119 of whom were treated with navigation. The cohort was 82.9% female and 14.4 years of age. The median radiation exposure (in millisieverts, mSv) for fluoroscopy, radiography, and navigation was 0.05, 4.14, and 8.19 mSv, respectively. When accounting for clinical and radiographic differences, patients treated with intraoperative navigation received 8.18 mSv more radiation (95%CI: 7.22-9.15, p <.001). This increase in radiation projects to 0.90 iatrogenic malignancies per 1,000 patients (95%CI 0.79-1.01).

Conclusions: Ours is the first work to define cancer risk in the setting of radiation exposure for navigated AIS surgery. We project that intraoperative navigation will generate approximately one iatrogenic malignancy for every 1,000 patients treated. Given that spine surgery for AIS is common and occurs in the context of a multitude of other radiation sources, these data highlight the need for radiation budgeting protocols and continued development of lower radiation dose technologies.

COMENTARIO

Interesante trabajo del equipo de Boston Children's en el que analiza el riesgo de desarrollar cáncer en pacientes operados de escoliosis idiopática.

RESULTADOS

Encontraron un aumento de riesgo de cáncer en los pacientes en los que se utilizó navegación que cuantificaron en un caso de neoplasia maligna por cada 1000 pacientes.

RELEVANCIA CLÍNICA

Aunque el riesgo atribuible a expuestos descrito en este estudio no es alto y hay que evaluar el riesgo/beneficio de cada técnica, este trabajo es importante porque llama la atención sobre el efecto de la radiación acumulada y el riesgo de desarrollar neoplasias malignas en pacientes con escoliosis idiopática. Está en línea con publicaciones recientes del grupo de la Clínica Mayo para desarrollar protocolos en los que la radiación a la que exponemos a los pacientes con escoliosis sea la estrictamente necesaria. La reducción de radiación a la dosis mínima imprescindible debe ser un elemento esencial en la toma de decisiones durante todo el seguimiento y tratamiento de estos pacientes.

CAN POSTOPERATIVE COBB AND PELVIC OBLIQUITY CORRECTIONS BE PREDICTED USING SUPINE TRACTION X-RAYS IN NON-AMBULATORY PATIENTS WITH CEREBRAL PALSY FUSED TO L5? A CASE SERIES STUDY

Morales Ciancio RA, Lucas J, Tucker S, Ember T, Harris M, Broomfield E

RESUMEN (ABSTRACT)

Purpose: This study aimed to determine whether Cobb and pelvic obliquity corrections can be predicted using supine traction radiographs in patients with cerebral palsy (CP) who underwent posterior spinal fusion (PSF) from T2/3 to L5.

Methods: From January 2010 to January 2020, 167 non-ambulatory patients with CP scoliosis underwent PSF using pedicle screws in two quaternary centers with a minimum of 2 years follow-up (FU). Radiological measurements and chart reviews were performed.

Results: A total of 106 patients aged 15.6 ± 0.4 years were included. All patients had significant correction of the Cobb angle (MC), pelvic obliquity (PO), thoracic kyphosis (TK), and lumbar lordosis (LL) without loss of correction at the last FU (LFU). Curve flexibility was significantly correlated with Cobb correction (δMC) immediately postoperatively ($p <0.0001$, $r= 0.8950$), followed by the amount of correction in pelvic obliquity under traction (δPOT) ($p= 0.0252$, $r= 0.2174$). For correction in PO (δPO), the most significant variable was δPOT ($p <0.0001$, $r= 0.7553$), followed by curve flexibility ($p= 0.0059$, $r= 0.26$) and the amount of correction in Cobb under traction ($p= 0.0252$, $r= 0.2174$).

Conclusions: Cobb and PO corrections can be predicted using supine traction films for non-ambulatory CP patients treated with PSF from T2/3 to L5. The variables evaluated were interconnected, reinforcing preoperative planning for these patients. Comparative large-scale studies on patient-related clinical outcomes are required to determine whether this predicted correction is associated with improved surgical outcomes and reduced complication rates.

COMENTARIO

Se trata de un estudio retrospectivo en más de 100 pacientes con parálisis cerebral que fueron tratados mediante instrumentación pedicular hasta L5 y artrodesis por vía posterior para la corrección de su escoliosis. El estudio se realizó en dos centros de Reino Unido. El objetivo del trabajo fue analizar si el análisis de la radiografía en tracción con halo podía servir para predecir la corrección obtenida con la cirugía.

RESULTADOS

En todos los pacientes se obtuvo una corrección significativa del ángulo de Cobb, la obliquidad pélvica, la cifosis torácica y la lordosis lumbar que se mantuvo al final de seguimiento. La flexibilidad de la curva estuvo significativamente correlacionada con la corrección de Cobb inmediatamente después de la cirugía, así como por la cantidad de corrección en la obliquidad pélvica bajo tracción. Para la corrección de la obliquidad pélvica, la variable más significativa fue la corrección de obliquidad pélvica en tracción p seguida por la flexibilidad de la curva y la cantidad de corrección en Cobb bajo tracción.

RELEVANCIA CLÍNICA

La selección de los niveles a instrumentar es uno de los factores más importantes a la hora de planificar la cirugía en un paciente con escoliosis neuromuscular.

La información que proporciona la radiografía preoperatoria en tracción puede ayudar a la selección del nivel de fusión especialmente a la hora de decidir la extensión o no a la pelvis.

EN-BLOC SPONDYLECTOMY IN THE LUMBAR SPINE: INDICATIONS, RESULTS AND COMPLICATIONS IN A SERIES OF 47 PATIENTS AFFECTED BY PRIMARY MALIGNANT BONE TUMORS

Luzzati A, Conti S, Sperduti I, Scotto Di Uccio A, Mazzoli S, Cannavò L, Scotto G, Zoccali C

RESUMEN (ABSTRACT)

Introduction: Wide Surgery is the reference treatment for malignant and aggressive benign primary bone tumors in the spine. When located in the lumbar spine, En-Bloc Spondylectomy (EBS) remains a complex challenge. Moreover, surgery is complicated by the presence of the diaphragm in the thoracolumbar junction and the hinderance of the iliac wings at the lumbosacral levels. Therefore, EBS in the lumbar spine frequently requires combined approaches. The purpose of this study is to describe clinical presentation, tumor characteristics and results of a series of 47 consecutive patients affected by malignant primary bone tumors of the lumbar spine who underwent EBS.

Materials and methods: 47 patients were reviewed. Complications were distinguished in early and late whether they occurred before or after 30 days from surgery. Overall survival (OS), disease-free survival (DFS) and local recurrence-free survival (LRFS) were calculated by the Kaplan-Meier product-limit method from surgery until relapse or death.

Results: 27 patients presented to observation after a first intralesional approach in a non-specialized center. Chordoma was the most represented histotype. Vertebrectomies were: 23 one-level, 10 two-level, 12 three-level and 2 four-level. Reconstructions were always carried out with screws and rods. The main postoperative complication was blood loss, while hardware failure was the main long-term complication. The 5-year LRFS was 75.5%, the 5-year DFS was 54.3%, and 5-year OS was 63.6%.

Conclusions: The surgical margin obtained during the index surgery was statistically associated with Local Recurrence, DFS and OS, underlining the importance of treating patients in reference centers.

COMENTARIO

Se trata de una serie relativamente larga para una patología y técnica quirúrgica poco frecuente realizado por un solo cirujano en el mismo centro.

RESULTADOS

El cordoma fue el diagnóstico más frecuente. Aproximadamente el 50% fueron vertebrectomías de un nivel, 25% de dos niveles y 25% de tres niveles. Hubo 2 pacientes a los que se resecaron cuatro niveles. principal complicación postoperatoria fue la pérdida de hemática, mientras que la falla del hardware fue la principal complicación a largo plazo. La supervivencia libre de recurrencia local a 5 años fue del 75.5%, la supervivencia libre de enfermedad a 5 años fue del 54.3%, y la supervivencia global a 5 años fue del 63.6%

RELEVANCIA CLÍNICA

A pesar de tratarse de una patología infrecuente y tratada sólo en centros especializados, es esencial para el ejercicio habitual de la especialidad el conocimiento del pronóstico global y complicaciones más frecuentes en los pacientes que requieren una vertebrectomía para el tratamiento de su patología oncológica.

MULTIDISCIPLINARY SURGICAL CONSIDERATIONS FOR EN BLOC RESECTION OF SACRAL CHORDOMA: REVIEW OF RECENT ADVANCES AND A CONTEMPORARY SINGLE-CENTER SERIES

Schroeder C, de Lomba WC, Leary OP, De la Garza Ramos R, Gillette JS, Miner TJ, Woo AS, Fridley JS, Gokaslan ZL, Zadnik Sullivan PL

RESUMEN (ABSTRACT)

Objective: Contemporary management of sacral chordomas requires maximizing the potential for recurrence-free and overall survival while minimizing treatment morbidity. En bloc resection can be performed at various levels of the sacrum, with tumor location and volume ultimately dictating the necessary extent of resection and subsequent tissue reconstruction. Because tumor resection involving the upper sacrum may be quite destabilizing, other pertinent considerations relate to instrumentation and subsequent tissue reconstruction. The primary aim of this study was to survey the surgical approaches used for managing primary sacral chordoma according to location of lumbosacral spine involvement, including a narrative review of the literature and examination of the authors' institutional case series.

Methods: The authors performed a narrative review of pertinent literature regarding reconstruction and complication avoidance techniques following en bloc resection of primary sacral tumors, supplemented by a contemporary series of 11 cases from their cohort. Relevant surgical anatomy, advances in instrumentation and reconstruction techniques, intraoperative imaging and navigation, soft-tissue reconstruction, and wound complication avoidance are also discussed.

Results: The review of the literature identified several surgical approaches used for management of primary sacral chordoma localized to low sacral levels (mid-S2 and below), high sacral levels (involving upper S2 and above), and high sacral levels with lumbar involvement. In the contemporary case series, the majority of cases (8/11) presented as low sacral tumors that did not require instrumentation. A minority required more extensive instrumentation and reconstruction, with 2 tumors involving upper S2 and/or S1 levels and 1 tumor extending into the lower lumbar spine. En bloc resection was successfully achieved in 10 of 11 cases, with a colostomy required in 2 cases due to rectal involvement. All 11 cases underwent musculocutaneous flap wound closure by plastic surgery, with none experiencing wound complications requiring revision.

Conclusions: The modern management of sacral chordoma involves a multidisciplinary team of surgeons and intraoperative technologies to minimize surgical morbidity while optimizing oncological outcomes through en bloc resection. Most cases present with lower sacral tumors not requiring instrumentation, but stabilizing instrumentation and lumbosacral reconstruction are often required in upper sacral and lumbosacral cases. Among efforts to minimize wound-related complications, musculocutaneous flap closure stands out as an evidence-based measure that may mitigate risk.

COMENTARIO

Se trata de un estudio de revisión y análisis de serie de 11 casos sobre la resección en bloque y el tratamiento multidisciplinar del cordoma sacro.

RESULTADOS

En la serie de casos contemporáneos, la mayoría de los casos (8/11) se presentaron como tumores sacros bajos (S2 o más caudal) que no requirieron instrumentación. Una minoría requirió instrumentación y reconstrucción más extensas, con 2 tumores que involucraban los niveles superiores de S2 y/o S1 y un caso en el que el tumor se extendía hacia la columna lumbar. La resección en bloque se logró con éxito en 10 de 11 casos, con una colostomía requerida en 2 casos debido al compromiso del recto. Todos los 11 casos fueron sometidos a cierre de la herida con colgajo musculocutáneo por parte de cirugía plástica, sin que ninguno experimentara complicaciones de la herida que requirieran revisión.

Al abordar aspectos multidisciplinares y revisar avances recientes, este estudio ofrece una perspectiva completa sobre las opciones quirúrgicas disponibles y sus implicaciones para el manejo de esta enfermedad. La inclusión de una serie de casos proporciona datos clínicos relevantes que respaldan las discusiones teóricas presentadas en la revisión. Este artículo ofrece información actualizada sobre las estrategias quirúrgicas para el tratamiento del cordoma sacro.

SINGLE-CENTER EXPERIENCE IN RESECTION OF 120 CASES OF INTRADURAL SPINAL TUMORS

Pojskić M, Bopp M, Saß B, Nimsky C

RESUMEN (ABSTRACT)

Background: Our study presents a single center experience in resection of intradural spinal tumors either with or without using intraoperative CT (iCT)-based registration and microscope-based augmented reality (AR). Microscope-based AR was recently described for improved orientation in the operative field in spine surgery, using superimposed images of segmented structures of interest in a two- (2D) or three-dimensional (3D) mode.

Materials and methods: All patients who underwent surgery for resection of intradural spinal tumors at our department were retrospectively included in the study. Clinical outcomes in terms of postoperative neurological deficits and complications were evaluated, as well as neuroradiological outcomes for tumor remnants and recurrence.

Results: 112 patients (57 female, 55 male, median age 55.8 ± 17.8 years) who underwent 120 surgeries for resection of intradural spinal tumors with use of intraoperative neuromonitoring were included in the study, with median follow up of 39 ± 34.4 months. Nine patients died during the follow-up to reasons unrelated to surgery. Most common tumors were meningioma (n= 41), schwannoma (n= 37), myopapillary ependymomas (n= 12), ependymomas (n= 10), and others (20). Tumors were in thoracic spine (n= 46), lumbar spine (n= 39), cervical spine (n= 32), lumbosacral spine (n= 1), thoracic and lumbar spine (n= 1) and one tumor in cervical, thoracic, and lumbar spine. Four biopsies were performed, ten partial resections, 13 subtotal resections, and 93 gross total resections. Laminectomy was the common approach. In 79 cases, patients experienced neurological deficits prior to surgery, with ataxia and paraparesis as the most common ones. Following surgery, 67 cases were unchanged, in 49 improved and in 4 worsened. Operative time, extent of resection, clinical outcome and complication rate did not differ between the AR and non-AR group. However, use of AR improved orientation in the operative field by identification of important neurovascular structures.

Conclusion: High rates of GTR with favorable neurological outcome in a vast majority of patients as well as low recurrence rate with comparable complication rates was noted in our single center experience. AR improved intraoperative orientation and increased surgeons comfort by enabling early identification of important anatomical structures, however clinical and radiological outcomes did not differ, when AR was not used.

COMENTARIO

Este artículo describe la experiencia de un solo centro en la resección tumores intradurales con una serie de 120 casos. Se evaluaron los resultados clínicos y radiológicos, así como las complicaciones perioperatorias.

RESULTADOS

Los resultados mostraron que la mayoría de los pacientes experimentaron mejorías postquirúrgicas desde el punto de vista neurológico.

El 10% de los pacientes tuvo que ser reoperado por fístula de líquido cefalorraquídeo, estos pacientes fueron tratados mediante reparación directa y colocación de drenaje lumbar. Otras complicaciones que requirieron cirugía de revisión incluyeron hematoma epidural postoperatorio, quilotórax, herniación del cono anterior y empiema, así como paraparesia postoperatoria como resultado de la compresión de la médula espinal después de la resección parcial de un meningioma calcificado de la columna torácica. Dos pacientes tuvieron recurrencia en el sitio de la cirugía primaria: 1 paciente

con un schwannoma cervical con NF-2 y 1 paciente con metástasis intramedular de un carcinoma pituitario. Veintidós pacientes con resección incompleta, recurrencia o tumores de grado II, III y IV según la OMS, fueron sometidos a radioterapia después de la cirugía.

RELEVANCIA CLÍNICA

Se trata de un estudio descriptivo que detalla la técnica quirúrgica y las ayudas técnicas modernas para el tratamiento de esta patología compleja incluyendo la navegación guiada por TC y la utilización de microscopio con realidad aumentada.

REDUCTION OF CHRONIC PRIMARY LOW BACK PAIN BY SPINAL MANIPULATIVE THERAPY IS ACCOMPANIED BY DECREASES IN SEGMENTAL MECHANICAL HYPERALGESIA AND PAIN CATASTROPHIZING: A RANDOMIZED PLACEBO-CONTROLLED DUAL-BLIND MIXED EXPERIMENTAL TRIAL

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RESUMEN (ABSTRACT)

Chronic primary low back pain (CPLBP) refers to low back pain that persists over three months, that cannot be explained by another chronic condition, and that is associated with emotional distress and disability. Previous studies have shown that spinal manipulative therapy (SMT) is effective to relieve CPLBP, but the underlying mechanisms remain elusive. This randomized placebo-controlled dual-blind mixed experimental trial (NCT05162924) aimed to investigate the efficacy of SMT to improve CPLBP and its underlying mechanisms. Ninety-eight individuals with CPLBP and 49 controls were recruited. Individuals with CPLBP received SMT (n= 49) or a control intervention (n= 49), twelve times over four weeks. The primary outcomes were CPLBP intensity (0-100 on a numerical rating scale) and disability (Oswestry Disability Index). Secondary outcomes included pressure pain thresholds in four body regions, pain catastrophizing, central sensitization inventory, depressive symptoms, and anxiety scores. Individuals with CPLBP showed widespread mechanical hyperalgesia (p <.001) and higher scores for all questionnaires (p <.001). SMT reduced pain intensity compared with the control intervention (mean difference: -11.7 [95% CI, -11.0 to -12.5], p= .01), but not disability (p= .5). Similar mild to moderate adverse events were reported in both groups. Mechanical hyperalgesia at the manipulated segment was reduced after SMT compared with the control intervention (p <.05). Pain catastrophizing was reduced after SMT compared with the control intervention (p <.05), but this effect was not significant after accounting for changes in clinical pain. Although the reduction of segmental mechanical hyperalgesia likely contributes to the clinical benefits of SMT, the role of pain catastrophizing remains to be clarified.

COMENTARIO

Este estudio es un ensayo clínico aleatorizado sobre el uso de la manipulación vertebral quiropráctica en pacientes de lumbalgia crónica. Los autores reclutaron a 100 pacientes con dolor lumbar que recibieron de forma aleatoria 12 sesiones repartidas en 4 semanas de manipulación vertebral dirigida al segmento lumbar más doloroso, o una manipulación considerada placebo previamente validada. Como medidas clínicas, utilizaron escalas visuales analógicas para valorar la intensidad del dolor y el cuestionario de discapacidad de Oswestry. En paralelo, se tomaron una serie de medidas de sensibilidad al dolor, así como unos cuestionarios que miden parámetros psicológicos y vinculados a la sensibilización central del dolor. Estas mismas medidas fueron evaluadas en 50 controles sanos durante 4 semanas, para determinar si los valores son importantes a la hora de discriminar personas sanas de pacientes con lumbalgia crónica.

RESULTADOS

Como resultado principal, cabe destacar que la terapia de manipulación vertebral consiguió una disminución de la intensidad del dolor clínicamente significativa con respecto a las medidas basales, y también en comparación a la manipulación placebo. Este efecto no solo fue detectado inmediatamente después de terminar las 12 sesiones, sino que se mantuvo hasta 4 meses después. Sin embargo, no hubo diferencias significativas entre grupos en lo que respecta a la discapacidad. Los pacientes que recibieron la manipulación real también demostraron una disminución significativa de la hipe-

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ralgesia mecánica en el segmento de aplicación de la manipulación vertebral, así como un menor puntaje en la escala de catastrofización del dolor, comparado a los pacientes expuestos al placebo. Ambas medidas también fueron determinantes a la hora de distinguir pacientes con dolor lumbar crónico de personas sanas de la misma edad y sexo. Los dos tratamientos fueron asociados a una cantidad similar de efectos adversos, de baja gravedad y corta duración.

RELEVANCIA CLÍNICA

A pesar de la abundancia de estudios enfocados en el alivio de la lumbalgia crónica, existen pocos tratamientos que hayan demostrado superioridad clara con respecto a un placebo adecuado en un diseño robusto. Al contrario que en ensayos clínicos sobre intervenciones farmacológicas, el diseño del placebo siempre representa un reto para los tratamientos no farmacológicos, incluyendo las terapias manuales como la manipulación vertebral. Por estos motivos, este ensayo clínico es pionero a la hora de mostrar que la terapia de manipulación vertebral podría ser más eficaz que un "buen" placebo. No solo la manipulación utilizada había sido previamente validada, sino que este estudio consiguió cegar a los pacientes al tratamiento recibido. Además, la evaluación de las medidas de resultado también se realizó de forma ciega. Esto añade algo más de certeza a los resultados obtenidos en este ensayo, comparado a los datos previamente publicados. Se podría concluir que este tratamiento relativamente corto de terapia de manipulación vertebral podría ser eficaz y segura para el alivio de la lumbalgia crónica. Además, el estudio clarifica algunos detalles sobre los posibles mecanismos de acción, que incluirían la reducción de la hiperalgesia mecánica y la modificación de pensamientos catastróficos.

THE EFFICACY OF ANCHORED STAND-ALONE SPACERS IN COMPARISON TO CONVENTIONAL CAGE AND PLATE IN ANTERIOR CERVICAL DISCECTOMY AND FUSION SURGERY: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS FOR CLINICAL AND RADIOLOGICAL OUTCOMES

McDonnell JM, Youssef S, Ross TD, Marland H, Turley L, Cunniffe G, Darwish S, Butler JS

RESUMEN (ABSTRACT)

Introduction: Anterior cervical discectomy and fusion (ACDF) is commonly performed with cage and plate constructs to stabilise diseased or injured cervical segments. Despite it being a commonly performed procedure, there are notable rates of associated morbidity reported in the literature. Stand-alone spacers represent a novel form of instrumentation to conventional cage and plate constructs.

Research question: Do stand-alone spacers have improved operative characteristics and postoperative outcomes in ACDF cohorts when compared to cage and plate constructs?

Methods: A systematic review and meta-analysis was conducted of PubMed/Medline, Embase and Google Scholar databases per the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes guidelines. Studies of interest included cage and plate instrumentation versus anchored stand-alone spacers for patients undergoing ACDF. Pre- and post-operative clinical and radiological outcomes were collated and compared for significance between cohorts.

Results: 10 RCTs were identified and included with 779 patients total. Mean age of the entire cohort was 50.1 years. 62% (483/779) of the cohort were male. 384 patients underwent ACDF with stand-alone cage, while 395 had ACDF with conventional cage and plate. Stand-alone spacers significantly outperformed conventional instrumentation in terms of estimated blood loss (p <0.01), total postoperative complications (p <0.01), dysphagia rates (p= 0.04) and adjacent segment disease (p= 0.04). Non-inferiority was evident in both patient reported outcome measures and radiological outcomes.

Conclusion: This meta-analysis highlights the efficacy of stand-alone spacers for the management of primarily cervical spondylitic disease for both single-level and multi-level pathology, and thus presents an attractive alternative to conventional instrumentation for patients undergoing ACDF surgery.

COMENTARIO

Se trata de estudio del más alto grado de evidencia científica comprando los resultados clínicos, radiológicos y las complicaciones entre estos dos tipos de implante para la artrodesis cervical anterior.

RESULTADOS

No se encontraron diferencias en las escalas de valoración entre los dos grupos. Sin embargo, sí encontraron diferencias significativas entre grupos en cuanto a la tasa de complicaciones. La tasa de complicaciones fue significativamente más baja en el grupo de implante sin placa.

RELEVANCIA CLÍNICA

Este estudio bien diseñado y de importante evidencia científica extrae conclusiones claras en relación a uno de los procedimientos más frecuentes que es parte del día a día en la mayoría de las unidades de cirugía de columna.

LONG-TERM (>24 MONTHS) DURATION OF SYMPTOMS NEGATIVELY IMPACTS PATIENT-REPORTED OUTCOMES FOLLOWING ANTERIOR CERVICAL DISCECTOMY AND FUSION FOR CERVICAL RADICULOPATHY

Liu E, Persad ARL, Baron N, Fourney DR

RESUMEN (ABSTRACT)

Study design: Retrospective cohort study.

Objective: To investigate the impact of long symptom duration (>24 mo) on patient self-reported outcomes for pain, function, and quality of life following anterior cervical discectomy and fusion (ACDF) for cervical radiculopathy.

Summary of background data: ACDF is an effective treatment to relieve the symptoms of cervical radiculopathy. However, there is no consensus on whether prolonged preoperative length of symptoms negatively impacts postoperative outcomes.

Methods: This study included consecutive patients who underwent ACDF for cervical radiculopathy from May 1, 2012 to Dec 1, 2019 by a single surgeon. Patients were stratified by short (<24 mo) and long (>24 mo) duration of symptoms. Outcomes including visual analog scale (VAS) neck and arm, neck disability index (NDI), EuroQol-5D (EQ-5D), and overall state of health (EQ-VAS) were compared between cohort both for absolute values and percentage of patients achieving minimal clinically important difference.

Results: A total of 111 consecutive patients were included in our study, including 59 patients in the short symptom duration group and 52 patients in the long symptom duration group. The mean age of the patients was 51.4±9.4 and 41 (36.9%) were female. The baseline VAS neck and arm, NDI, EQ-5D, and EQ-VAS were similar between groups. Patients in both long and short symptom duration groups had clinical improvement following surgery. However, patients with short symptom duration had better VAS Neck and EQ-5D outcomes, and were more likely to meet minimal clinically important difference for NDI, EQ-5D, or any outcome. Multivariate analysis confirmed symptom duration <24 months as an independent predictor for better patient-reported outcomes.

Conclusion: We appreciated better clinical outcomes in patients with shorter symptom duration who received ACDF for cervical radiculopathy. On the basis of this data, we advocate for prompt treatment of cervical radiculopathy to avoid the potential for long-term impairment.

COMENTARIO

Es un estudio interesante a pesar de contar con ciertas limitaciones metodológicas al tratarse retrospectivo y que no describe detalladamente la distribución de determinados factores de riesgo entre los dos grupos.

RESULTADOS

Los autores encontraron peores resultados clínicos en aquellos pacientes en los que se demoró la cirugía más de dos años.

RELEVANCIA CLÍNICA

Las conclusiones de este estudio concuerdan con otros similares que analizan el resultado post-quirúrgico en función del tiempo desde el comienzo de los síntomas y la cirugía en pacientes con radiculopatía por hernia discal lumbar. Los autores hacen hincapié en la importancia de la adecuada gestión de recursos en los sistemas públicos de salud para evitar demoras innecesarias que pueden influir directamente en los resultados clínicos.

MULTI-LEVEL POSTERIOR CERVICAL FORAMINOTOMY ASSOCIATED WITH INCREASED POST-OPERATIVE INFECTION RATES AND OVERALL RE-OPERATION RELATIVE TO ANTERIOR CERVICAL DISCECTOMY WITH FUSION OR CERVICAL DISC ARTHROPLASTY

Ng MK, Kobryn A, Baidya J, Nian P, Emara AK, Ahn NU, Houten JK, Saleh A, Razi AE

RESUMEN (ABSTRACT)

Study design: Retrospective cohort study.

Objective: Cervical radiculopathy meeting operative criteria has traditionally been managed using anterior cervical discectomy and fusion (ACDF). However, cervical disc arthroplasty (CDA) and posterior cervical foraminotomy (PCF) are also reasonable options. This study aimed to assess differences in postoperative outcomes among patients undergoing multi-level ACDF, CDA, or PCF comparing medical/surgical complications and healthcare utilization parameters.

Methods: Patients who underwent multi-level ACDF, CDA, or PCF between 2012 and 2019 were identified from the American College of Surgeons National Surgical Quality Improvement Project (ACS-NSQIP) database. Patients were stratified based on procedure type and propensity score matched to resolve baseline differences. ANOVA was performed to identify differences in medical complications, surgical complications, and healthcare utilization metrics.

Results: A total of 31 344 patients who underwent an eligible procedure were identified (ACDF: n= 28 089, CDA: n= 1748, PCF: n= 1507), and 684 patients remained in each group following propensity score matching. Patients undergoing multi-level PCF were found to experience longer lengths of hospital stay (PCF: 1.67 ± 1.61 days, ACDF: 1.50 ± 1.32 days, CDA: 1.27 ± 1.05 days, P <.001), higher rates of reoperation (PCF: 3.2%, ACDF: 1.0%, CDA: .4%, P= .020), superficial infection (PCF: 1.3%, ACDF: .3%, CDA: .1%, P= .008) and deep infection (PCF: 1.2%, ACDF: 0%, CDA: 0%, P <.001). There were no outcome differences between multi-level ACDF and CDA.

Conclusions: Patients undergoing multi-level PCF were at increased risk for longer hospital stay, re-operation, and infection relative to those undergoing ACDF and CDA. Future research should aim to uncover the precise mechanisms underlying these complications, as well as analyze long term outcomes.

COMENTARIO

Se trata de un estudio del registro del Colegio de Cirujanos Americano (American College of Surgeons) en los que identificaron un total de 28.000 pacientes que fueron intervenidos quirúrgicamente para el tratamiento de radiculopatía de origen cervical. Se estudió de forma retrospectiva la estancia media, el índice de reoperaciones y las complicaciones comparando los resultados entre 3 grupos: prótesis de disco, artrodesis cervical y foraminotomía posterior, todos ellos de al menos dos niveles.

RESULTADOS

Se encontró una mayor tasa de complicaciones, estancia media e índice de reintervención en el grupo de foraminotomía posterior. No se encontraron diferencias significativas entre artoplastia y artrodesis cervical por vía anterior.

Mediante análisis univariante se eliminaron todas las discrepancias estadísticamente significativas en cuanto a valores demográficos y comorbilidades, incluyendo edad (P= .106), disnea (P= .9941), sexo, IMC, diabetes, estado de fumador, EPOC, hipertensión, uso de esteroides, estado funcional y clasificación ASA

El dolor radicular en extremidades superiores secundario a patología discal cervical es una de las patologías que con más frecuencia tratan los cirujanos espinales. Considerando la literatura existente revisada en el artículo y los hallazgos de este estudio, se debe realizar un análisis de riesgo-beneficio cauteloso antes de elegir la descompresión por vía posterior frente a las otras alternativas, además de utilizar enfoques mínimamente invasivos siempre que sea posible.

PREVALENCE OF NECK PAIN IN PATIENTS WITH DEGENERATIVE CERVICAL MYELOPATHY AND SHORT-TERM RESPONSE AFTER OPERATIVE TREATMENT: A COHORT STUDY OF 664 PATIENTS FROM 26 GLOBAL SITES

Schneider MM, Badhiwala JH, Alvi MA, Tetreault LA, Kalsi P, Idler RK, Wilson JR, Fehlings MG

RESUMEN (ABSTRACT)

Study design: Ambispective cohort study.

Objectives: 1) To define the prevalence of neck pain in patients with degenerative cervical myelopathy (DCM). 2) To identify associated factors of preoperative neck pain in patients with DCM. 3) To assess the neck pain response to surgical intervention.

Methods: 757 patients with DCM were enrolled at 26 global sites from 2005 to 2011. A total of 664 patients had complete neck pain scores preoperatively (Neck Disability Index, NDI). The prevalence and severity of neck pain preoperatively and at the 6-months follow-up was summarized. Functional assessments of individuals with and without pain were compared. Associations of preoperative neck pain and related factors were evaluated.

Results: Preoperatively, 79.2% of patients reported neck pain while 20.8% had no neck pain. Of individuals with neck pain, 20.2% rated their pain as very mild, 27.9% as moderate, 19.6% as fairly severe, 9.6% as very severe and 1.9% as the worst imaginable. Functional status (mJOA), number of stenotic levels, age, and duration of symptoms did not significantly differ in patients with and without pain. Factors associated with the presence of neck pain were female gender, BMI ≥27 kg/m2, rheumatologic and gastrointestinal comorbidities, and age <57 years. Neck pain improved significantly from the preoperative examination to the 6-months postoperative follow-up (P <.0001).

Conclusion: Here, we demonstrate a high prevalence of neck pain in patients with DCM as well as a link between gender, body weight, comorbidity and age. We highlight a significant reduction in neck pain 6 months after surgery.

COMENTARIO

Se trata de un estudio multicéntrico internacional en el que se estudió un total de 757 pacientes de 26 centros. Los autores analizaron la presencia de dolor cervical en pacientes intervenidos de mielopatía cervical.

RESULTADOS

Preoperatoriamente, el 79.2% de los pacientes reportaron cervicalgia. De las personas con dolor cervical, el 20.2% lo calificaron como muy leve, el 27.9% como moderado, el 19.6% como bastante severo, el 9.6% como muy severo y el 1.9% como lo peor imaginable. El estado funcional (mJOA), el número de niveles estenóticos, la edad y la duración de los síntomas no diferían significativamente en pacientes con y sin dolor. Los factores asociados con la presencia de dolor cervical fueron el sexo femenino, un IMC ≥27 kg/m2, comorbilidades reumatológicas y gastrointestinales, y edad <57 años. Los autores encontraron una mejoría significativa del dolor cervical al sexto mes postquirúrgico.

RELEVANCIA CLÍNICA

Los pacientes que requieren cirugía por mielopatía cervical tienen en muchos casos sintomatología acompañante de menor gravedad que puede suponer una importante merma en la calidad de vida de los pacientes. La presencia de dolor cervical y las expectativas de mejoría con cirugía son dos de las preocupaciones más frecuentes para el paciente.

SPINE-SPECIFIC SARCOPENIA: DISTINGUISHING PARASPINAL MUSCLE ATROPHY FROM GENERALIZED SARCOPENIA

Schönnagel L, Chiaparelli E, Camino-Willhuber G, Zhu J, Caffard T, Tani S, Burkhard MD, Kelly M, Guven AE, Shue J, Sama AA, Girardi FP, Cammisa FP, Hughes AP

ABSTRACT (RESUMEN)

Background context: Atrophy of the paraspinal musculature (PM) as well as generalized sarcopenia are increasingly reported as important parameters for clinical outcomes in the field of spine surgery. Despite growing awareness and potential similarities between both conditions, the relationship between «generalized» and «spine-specific» sarcopenia is unclear.

Purpose: To investigate the association between generalized and spine-specific sarcopenia.

Study design: Retrospective cross-sectional study.

Patient sample: Patients undergoing lumbar spinal fusion surgery for degenerative spinal pathologies.

Outcome measures: Generalized sarcopenia was evaluated with the short physical performance battery (SPPB), grip strength, and the psoas index, while spine-specific sarcopenia was evaluated by measuring fatty infiltration (FI) of the PM.

Methods: We used custom software written in MATLAB® to calculate the FI of the PM. The correlation between FI of the PM and assessments of generalized sarcopenia was calculated using Spearman's rank correlation coefficient (rho). The strength of the correlation was evaluated according to established cut-offs: negligible: 0-0.3, low: 0.3-0.5, moderate: 0.5-0.7, high: 0.7-0.9, and very high≥0.9. In a Receiver Operating Characteristics (ROC) analysis, the Area Under the Curve (AUC) of sarcopenia assessments to predict severe multifidus atrophy (FI≥50%) was calculated. In a secondary analysis, factors associated with severe multifidus atrophy in non-sarcopenic patients were analyzed.

Results: A total of 125 (43% female) patients, with a median age of 63 (IQR 55-73) were included. The most common surgical indication was lumbar spinal stenosis (79.5%). The median FI of the multifidus was 45.5% (IQR 35.6-55.2). Grip strength demonstrated the highest correlation with FI of the multifidus and erector spinae (rho= -0.43 and -0.32, p <.001); the other correlations were significant (p <.05) but lower in strength. In the AUC analysis, the AUC was 0.61 for the SPPB, 0.71 for grip strength, and 0.72 for the psoas index. The latter two were worse in female patients, with an AUC of 0.48 and 0.49. Facet joint arthropathy (OR: 1.26, 95% CI: 1.11-1.47, p= .001) and foraminal stenosis (OR: 1.54, 95% CI: 1.10-2.23, p= .015) were independently associated with severe multifidus atrophy in our secondary analysis.

Conclusion: Our study demonstrates a low correlation between generalized and spine-specific sarcopenia. These findings highlight the risk of misdiagnosis when relying on screening tools for general sarcopenia and suggest that general and spine-specific sarcopenia may have distinct etiologies.

COMENTARIO

Se trata de un trabajo de investigación clinica que investiga la asociación entre la sarcopenia generalizada y específica de la columna.

Es un estudio de tipo transversal retrospectivo de pacientes sometidos a cirugía de fusión espinal lumbar por patologías degenerativas de la columna.

El estudio demuestra una baja correlación entre la sarcopenia generalizada y específica de la columna. Estos hallazgos resaltan el riesgo de diagnóstico erróneo al confiar en herramientas de detección

para la sarcopenia general y sugieren que la sarcopenia general y específica de la columna pueden tener etiologías distintas.

RELEVANCIA CLÍNICA

La atrofia de la musculatura paraespinal, así como la sarcopenia generalizada, se informan cada vez más como parámetros importantes para los resultados clínicos en el campo de la cirugía de columna. A pesar de la creciente conciencia y las posibles similitudes entre ambas afecciones, la relación entre la sarcopenia «generalizada» y «específica de la columna» no está clara.

En este artículo, los autores remarcan la importancia de conseguir una restauración adecuada de lordosis lumbar en cirugía degenerativa de columna. Las fusiones cortas pueden llevar a deformidades iatrogénicas si la distribución y la magnitud de la lordosis no son correctamente restablecidas.

Los autores presentan un cambio de paradigma en la planificación y avisan que los conceptos de PI-LL mismatch o de lordosis craneal y caudal pueden ser insuficientes para planificar con precisión una fusión lumbar corta. El concepto de lordosis segmentaria puede ayudar a la planificación.

Un estudio de la patología discal y de los cambios compensatorios permite definir los segmentos que deben ser fusionados y la distribución de lordosis que debe ser obtenida.

COMPARING IMAGE NORMALIZATION TECHNIQUES IN AN END-TO-END MODEL FOR AUTOMATED MODIC CHANGES CLASSIFICATION FROM MRI IMAGES

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RESUMEN (ABSTRACT)

Introduction: Modic Changes (MCs) are MRI alterations in spine vertebrae's signal intensity. This study introduces an end-to-end model to automatically detect and classify MCs in lumbar MRIs. The model's two-step process involves locating intervertebral regions and then categorizing MC types (MC0, MC1, MC2) using paired T1-and T2-weighted images. This approach offers a promising solution for efficient and standardized MC assessment.

Research question: The aim is to investigate how different MRI normalization techniques affect MCs classification and how the model can be used in a clinical setting.

Material and methods: A combination of Faster R-CNN and a 3D Convolutional Neural Network (CNN) is employed. The model first identifies intervertebral regions and then classifies MC types (MC0, MC1, MC2) using paired T1- and T2- weighted lumbar MRIs. Two datasets are used for model development and evaluation.

Results: The detection model achieves high accuracy in identifying intervertebral areas, with Intersection over Union (IoU) values above 0.7, indicating strong localization alignment. Confidence scores above 0.9 demonstrate the model's accurate levels identification. In the classification task, standardization proves the best performances for MC type assessment, achieving mean sensitivities of 0.83 for MC0, 0.85 for MC1, and 0.78 for MC2, along with balanced accuracy of 0.80 and F1 score of 0.88.

Discussion and conclusion: The study's end-to-end model shows promise in automating MC assessment, contributing to standardized diagnostics and treatment planning. Limitations include dataset size, class imbalance, and lack of external validation. Future research should focus on external validation, refining model generalization, and improving clinical applicability.

COMENTARIO

Trabajo que estudia la utilización de inteligencia artificial en resonancia magnética, en este caso para la caracterización de cambios Modic.

RESULTADOS

El modelo utilizado para la detección del nivel obtuvo una alta precisión en la identificación de los discos, con valores de Intersección sobre Unión (IoU) por encima de 0.7, que indica un fuerte alineamiento de localización. En cuanto a la clasificación, la estandarización demostró los mejores rendimientos para la clasificación del Modic, con sensibilidad superior al 0.8.

RELEVANCIA CLÍNICA

A pesar de que los modelos estudiados en este trabajo no estén aún suficientemente perfeccionados para la práctica clínica real, es una muestra interesante de los avances en el campo de la inteligencia artificial para el estudio de imagen en pacientes con dolor lumbar.

PLASMA D-DIMER LEVELS CAN PROVIDE USEFUL DIAGNOSTIC INFORMATION ON ACUTE VERTEBRAL COMPRESSION FRACTURES IN PATIENTS WITH LOW BACK PAIN IN THE EMERGENCY ROOM

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RESUMEN (ABSTRACT)

Background: Patients with acute vertebral compression fractures (aVCFs) are frequently transferred to an emergency department by ambulance. The most useful imaging modality is magnetic resonance imaging (MRI); however, which patients should be prioritized for MRI evaluation may be unclear. The aim of this study was to evaluate plasma D-dimer levels as a biomarker for aVCFs.

Methods: This retrospective cohort study included patients with low back pain in the emergency department between November 2017 and October 2020. Patients with infections, patients with coagulation disorders, and patients without D-dimer level measurements were excluded. The presence of an aVCF was detected with MRI. Blood samples were collected for routine blood tests. The predictive factors for aVCFs were evaluated with univariate and multivariable logistic regression analyses.

Results: Overall, 191 consecutive MRI evaluations were ordered. After exclusions, 101 patients were reviewed. Based on MRI, 65 (64.4%) patients were diagnosed with aVCF. The presence of aVCF was significantly correlated with age (odds ratio [OR] = 1.052, 95% confidence interval [CI] 1.018-1.191), an old vertebral compression fracture (OR= 3.290, 95% CI 1.342-8.075), hemoglobin (OR= 0.699, 95% CI 0.535-0.912), and D-dimer levels (OR= 1.829, 95% CI 1.260-2.656). Results from a multivariable logistic regression analysis showed that D-dimer levels (OR= 1.642, 95% CI 1.188-2.228) remained a significant risk factor for the presence of aVCFs after adjustment for potential confounders.

Conclusions: Plasma D-dimer levels can provide useful diagnostic information about whether an aVCF is present.

COMENTARIO

Este estudio de Japón analiza la correlación entre el hallazgo de un dímero-D elevado y la presencia de fractura vertebral osteoporótica en pacientes que acudieron a urgencias por dolor lumbar o dorsal tras un traumatismo de baja energía.

RESULTADOS

En un total de 100 pacientes analizados, se encontró una correlación significativa entre los niveles de dímero-D y la presenta de fractura vertebral osteoporótica.

RELEVANCIA CLÍNICA

En un medio en el que la RMN no está disponible de manera rutinaria en la atención en urgencias, la utilización del dímero-D puede ser de utilidad para la sospecha diagnóstica en pacientes osteoporóticos que acuden a urgencias por dolor lumbar o dorsal.

IMPACT OF TERIPARATIDE ON COMPLICATIONS AND PATIENT-REPORTED OUTCOMES OF PATIENTS UNDERGOING LONG SPINAL FUSION ACCORDING TO BONE DENSITY

Mohanty S, Sardar ZM, Hassan FM, Lombardi JM, Lehman RA, Lenke LG

COMENTARIO

Se estudió la tasa de pseudoartrosis y reoperación a los dos años de la cirugía en tres grupos diferentes de pacientes sometidos a cirugía de deformidad. Los grupos fueron: 1) Pacientes con osteoporosis tratados con teriparatida. 2) Pacientes con osteopenia. 3) Pacientes con rangos normales de densidad mineral ósea.

RESULTADOS.

En el grupo de pacientes osteoporóticos tratados con teriparatida se encontró menor tasa de reintervención y de pseudoartrosis a los 2 años que en el grupo de pacientes con osteopenia. Además, los resultados clínicos medidos en escalas de valoración reportados por el paciente fueron equiparables entre los pacientes con osteoporosis tratados con teriparatida y aquellos con densidad mineral ósea normal.

RELEVANCIA CLÍNICA

La utilización de teriparatida de manera rutinaria en los pacientes con baja densidad mineral ósea podría reducir la tasa de complicaciones y aumentar los resultados clínicos medidos con escalas de valoración en pacientes sometidos a cirugía de fusión espinal larga.