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La newsletter de l'AJCR !



# AJCR

( Association des Jeunes Chirurgiens du Rachis )

## Newsletter #4 / Application AJCR

### La nouvelle application AJCR pour smartphone!

Chers amis,

Cela fait maintenant quelques semaines que la nouvelle version de l'application AJCR est disponible sur vos smartphones! Tu ne la connais pas encore? Elle va t'accompagner dans ta pratique quotidienne de la chirurgie du rachis.

Tu y trouveras:

- 1) Un logbook des patients que tu as (ou que tu vas) opérer avec leurs scores, angles et icône. Tu peux même ensuite exporter tes données.
- 2) Les principales classifications
- 3) Un goniomètre pour mesurer facilement les paramètres pelviens et les angles de Cobb
- 4) Les scores les plus utilisés en chirurgie du rachis

Télécharge l'application dès maintenant:

iOS: <https://itunes.apple.com/be/app/ajcr/id996338877?l=fr&mt=8>

Android: <https://play.google.com/store/apps/details?id=cc.fovea.ajcr&hl=fr>

Nous tenons à remercier notre partenaire MEDICREA, qui nous a permis de pouvoir développer cette application!

Rachidiennement votre,

*Le bureau AJCR*



Logbook



Classifications



Goniomètre



Scores



34 °

STANDARD COBB P. PELVIENS



## Évènements à venir

- 47ème Réunion du GES: 18-19 Mars 2016 - Cité Mondiale, Bordeaux
- **Atelier Pratique SFCR: 01 Avril 2016 - Faculté de Médecine, Nice.**  
Thème abordé: Instrumentation thoraco-lombaire postérieure, percutanée et à ciel ouvert. Encadré par Stéphane Litrico et Nicolas Bronsard! Inscrivez-vous au plus vite auprès de la SFCR ([www.sfcr.fr](http://www.sfcr.fr) / [congres@sfcr.fr](mailto:congres@sfcr.fr))
- Réunion Parisienne du Rachis: 30 Avril 2016 - Siège de la SOFCOT

## Les facteurs prédictifs de dégradation des segments adjacents après une fixation rachidienne par *Laura MARIE-HARDY*

La dégénérescence des segments adjacents après une fusion, en quelque étage que ce soit est un phénomène connu depuis longtemps ; les questions qui persistent sont à propos des facteurs de risque : sont-ils uniquement liés au type de fusion (antérieure, postérieure) ; à la longueur de la fusion ou à des paramètres liés au patient (équilibre

sagittal) ?

Quelques articles essaient de faire le point sur cette pathologie malheureusement trop fréquente.

- Une étude rétrospective américaine parue dans Spine en février 2016 étudie différents facteurs ; au niveau lombaire uniquement ; sur une cohorte de 137 patients. Les facteurs statistiquement associés à une dégénérescence du segment adjacent sont de façon péjorative : une déformation de type scoliotique sous-jacente (OR 34), une fusion L4-S1 (OR 56) et la prise d'antidépresseurs (OR 5). Une faible pente sacrée semble plutôt être un facteur protecteur (OR 0.9).
- Une autre étude rétrospective ; sur 490 patients ; s'est posé la question de savoir si les PLIF occasionnaient plus de dégénérescence du segment adjacent que les fusions postéro-latérales ? Sur cette cohorte avec un âge médian à 51 ans et une fusion lombaire de 3 ou moins de niveaux ; le taux global de ré-intervention pour dégénérescence du segment adjacent étaient de 4.7% (un peu plus élevé que les données de la littérature ; qui tournent autour de 2-3%). Les résultats retrouvent une incidence de DSA 3.4 fois plus élevée en cas de PLIF par rapport aux fusions postéro-latérales ; statistiquement significatif. L'âge supérieur à 60 ans était également retrouvé comme facteur de risque ; mais pas le sexe, le diagnostic préopératoire, le nombre de segment arthrodésés ou la présence d'une laminectomie. A noter que le critère de jugement principal est la ré-intervention pour DSA et non le diagnostic de DSA, symptomatique ou non...
- Une autre étude, japonaise cette fois ; rétrospective sur un total de 55 patients ; s'est intéressée aux facteurs de risque de dégénérescence du segment adjacent sur des patients opérés d'un PLIF en L4-L5 pour spondylolisthésis. Sur une durée de suivi supérieure à 2 ans ; ils ont identifié comme facteurs de risque de DSA (dégénérescence du segment adjacent) la laminectomie associée en L3-L4 ; la lordose locale et l'angle sagittal de l'articulaire L3-L4. Les auteurs notent aussi qu'une DSA symptomatique est statistiquement associée à un antélisthésis au-dessus de la zone de fusion.
- Nous ne pouvons pas ne pas citer la revue de la littérature, certes un peu ancienne (2004) ; mais publiée dans Spine sur le sujet. On est frappé par l'incidence de la pathologie (5 à 100% sur un suivi de 36 à 369 mois ; et 5 à 18,5% de patients symptomatiques ; lors de suivis de 44 à 164 mois). Un élément nouveau est à noter : la fixation pédiculaire comme facteur de risque (12 à 18%) ; comparé aux autres

types de fixation (5%). Les autres facteurs de risque retrouvés sont la longueur de fusion, la présence d'une instrumentation, un déséquilibre sagittal post-opératoire, des lésions articulaires, l'âge du patient et des lésions dégénératives préopératoires.

- Une dernière étude ; là aussi publiée dans Spine ; en 2007 est intéressante ; bien que rétrospective et strictement radiologique. Sur une série de 188 patients et avec une durée moyenne de suivi de 5 ans ; elle met en évidence le niveau L1 à L3 comme facteur de risque de DSA versus une arthrodèse en L4-L5. L'âge (supérieur à 50 ans) est également retrouvé comme facteur de risque dans cette étude.

Au total ; nous voyons bien la fréquence de cette pathologie, non systématiquement symptomatique, bien au contraire. L'analyse des facteurs de risque, retrouvent beaucoup d'éléments intrinsèques (âge du patient...) ; mais certains sur lesquels nous pouvons influencer (fixation pédiculaire versus autres fixations ; attention particulière à l'équilibre sagittal post-opératoire ou encore la longueur de la fusion...) ; qui doivent nous faire réfléchir pour ne pas accumuler ces facteurs de risque et faire en sorte que la dégénérescence du segment adjacent ne soit plus une fatalité.

[Spine \(Phila Pa 1976\)](#). 2016 Feb 6.

### **Predisposing Characteristics of Adjacent Segment Disease Following Lumbar Fusion.**

[Alentado VJ](#)<sup>1</sup>, [Lubelski D](#), [Healy AT](#), [Orr RD](#), [Steinmetz MP](#), [Benzel EC](#), [Mroz TE](#).

#### **Abstract**

##### **STUDY DESIGN:**

Retrospective Review.

##### **OBJECTIVE:**

To determine medical, radiographic and surgical risk factors for the development of ASD following lumbar fusion.

##### **SUMMARY OF BACKGROUND DATA:**

Adjacent segment disease (ASD) is a recognized outcome of spinal fusion that leads to increased costs and debilitating symptoms for patients. However, a comprehensive understanding of risk factors for the development of this surgical outcome does not exist.

##### **METHODS:**

The medical records of patients who received their first lumbar fusion for any indication were retrospectively examined for preoperative medical comorbidities and medications, as well as surgical approach and perioperative complications. A blinded reviewer assessed radiographs for each patient to examine sagittal alignment following fusion. Multivariable

logistic regression was used to model the risk of developing ASD on the basis of one or more predictors.

**RESULTS:**

A total of 137 patients fit the inclusion criteria; 9% required a follow-up operation for degeneration at segments adjacent to the fusion. The ASD group had a mean follow-up of 21.1 months prior to revision surgery and an overall follow-up of 41.0 months. The average follow-up in the control group was 14.0 months. Statistically significant independent predictors of developing ASD included antidepressant use (OR=5.4), diagnosis of degenerative scoliosis (OR=34.2), fusion of L4-S1 (OR=56.5), having no decompressions adjacent to the fusion, and low sacral slope (OR=0.9). No patient who developed ASD received a decompression adjacent to the fusion such that an odds ratio could not be generated for this independent predictor.

**CONCLUSIONS:**

This study is the first to use a combination of medical, surgical and postoperative sagittal balance as risk factors for the development of adjacent segment disease after lumbar fusion. The awareness of these risk factors may allow for better patient selection and surgical technique to decrease the probability of acquiring this adverse outcome.

**LEVEL OF EVIDENCE:**

4.

[Spine \(Phila Pa 1976\)](#). 2014 Mar 1

**Risk factors of adjacent segment disease requiring surgery after lumbar spinal fusion: comparison of posterior lumbar interbody fusion and posterolateral fusion.**

[Lee JC](#)<sup>1</sup>, [Kim Y](#), [Soh JW](#), [Shin BJ](#).

**Author information****Abstract****STUDY DESIGN:**

A retrospective study.

**OBJECTIVE:**

To determine the incidence and risk factors of adjacent segment disease (ASD) requiring surgery among patients previously treated with spinal fusion for degenerative lumbar disease and to compare the survivorship of adjacent segment according to various risk factors including comparison of fusion methods: posterior lumbar interbody fusion (PLIF) versus posterolateral fusion (PLF).

**SUMMARY OF BACKGROUND DATA:**

One of the major issues after lumbar spinal fusion is the development of adjacent segment disease. Biomechanically, PLIF has been reported to be more rigid than PLF, and therefore, patients who undergo PLIF are suspected to experience a higher incidence of ASD than those who underwent PLF. There have been many studies analyzing the risk factors of ASD, but we are not aware of any study comparing PLIF with PLF in incidence of ASD requiring surgery.

**METHODS:**

A consecutive series of 490 patients who had undergone lumbar spinal fusion of 3 or fewer segments to treat degenerative lumbar disease was identified. The mean age at index operation was 53 years, and the mean follow-up period was 51 months (12-236 mo). The number of patients treated by PLF and PLIF were 103 and 387, respectively. The incidence and prevalence of revision surgery for ASD were calculated by Kaplan-Meier method. For risk factor analysis, we used log-rank test and Cox regression analysis with fusion methods, sex, age, number of fused segments, and presence of laminectomy adjacent to index fusion.

### **RESULTS:**

After index spinal fusion, 23 patients (4.7%) had undergone additional surgery for ASD. Kaplan-Meier analysis predicted a disease-free survival rate of adjacent segments in 94.2% of patients at 5 years and 89.6% at 10 years after the index operation. In the analysis of risk factors, PLIF was associated with 3.4 times higher incidence of ASD requiring surgery than PLF ( $P = 0.037$ ). Patients older than 60 years at the time of index operation were 2.5 times more likely to undergo revision operation than those younger than 60 years ( $P = 0.038$ ). There were no significant differences in survival rates of the adjacent segment according to sex, preoperative diagnosis, number of fused segments, and concomitant laminectomy to adjacent segment.

### **CONCLUSION:**

It was predicted that 10% of patients would undergo additional surgery for treating ASD within 10 years after index lumbar fusion. In this study, PLIF showed higher incidence of ASD than did PLF. Patient age greater than 60 years was another independent risk factor. Surgeons should carefully consider these factors at the time of surgical planning of lumbar fusion.

### **LEVEL OF EVIDENCE:**

3.

[J Spinal Disord Tech](https://doi.org/10.1097/BSD.0b013e31824e5292). 2014 Apr;27(2):70-5. doi: 10.1097/BSD.0b013e31824e5292.

**Risk factors for adjacent segment disease after posterior lumbar interbody fusion and efficacy of simultaneous decompression surgery for symptomatic adjacent segment disease.**

[Hikata T<sup>1</sup>](#), [Kamata M](#), [Furukawa M](#).

### **Author information**

#### **Abstract**

#### **STUDY DESIGN:**

A retrospective study.

#### **SUMMARY OF BACKGROUND DATA:**

Posterior lumbar interbody fusion (PLIF) increases mechanical stress and can cause degenerative changes at the adjacent segment. However, the precise causes of adjacent segment disease (ASD) after PLIF are not known, and it is unclear whether simultaneous decompression surgery for symptomatic ASD is effective.

#### **OBJECTIVE:**

To study, radiographically and symptomatically, the risk factors for adjacent segment disease (ASD) in the lumbar spine after L4/5 PLIF and to examine whether decompression surgery for the adjacent segment (L3/4) reduces the occurrence of symptomatic ASD.

#### **METHODS:**

Fifty-four patients who underwent L4/5 PLIF for L4 degenerative spondylolisthesis and could be followed up for at least 2 years were included. Of these, 37 were treated simultaneously with decompression surgery at L3/4. We measured radiographic changes and assessed symptoms from the cranial adjacent segment.

#### **RESULTS:**

Thirty-one patients (57.4%) met radiologic criteria for ASD. The length of follow-up ( $P=0.004$ ) and simultaneous decompression surgery at L3/4 ( $P=0.009$ ) were statistically significant factors for radiologic diagnosis of ASD. Seven patients (13.0%) had symptomatic ASD: 6 in the decompression group (16.2%) and 1 in the PLIF-only group (5.9%). Simultaneous decompression surgery did not reduce the incidence of symptomatic ASD ( $P=0.256$ ). Local lordosis at the fused segment ( $P=0.005$ ) and the sagittal angle of the facet joint at L3/4 ( $P=0.024$ ) were statistically significant predictors of symptomatic ASD, which was accompanied by postoperative anterior listhesis above the fused segment (S group,  $8.4\% \pm 8.0\%$ ; nonsymptomatic group:  $-0.7\% \pm 5.0\%$ ,  $P=0.024$ ).

#### **CONCLUSIONS:**

Patients whose facet joint at the adjacent segment had a more sagittal orientation had postoperative anterior listhesis, which caused symptomatic ASD. Simultaneous decompression surgery without fusion at the adjacent level was not effective for these patients, but rather, there was a possibility that it induced symptomatic ASD.

[Spine \(Phila Pa 1976\)](#). 2004 Sep 1;29(17):1938-44.

#### **Adjacent segment disease after lumbar or lumbosacral fusion: review of the literature.**

[Park P<sup>1</sup>](#), [Garton HJ](#), [Gala VC](#), [Hoff JT](#), [McGillicuddy JE](#).

#### **Author information**

#### **Abstract**

#### **STUDY DESIGN:**

Review of the literature.

#### **OBJECTIVES:**

Review the definition, etiology, incidence, and risk factors associated with as well as potential treatment options.

#### **SUMMARY OF BACKGROUND DATA:**

The development of pathology at the mobile segment next to a lumbar or lumbosacral spinal fusion has been termed adjacent segment disease. Initially reported to occur rarely, it is now considered a potential late complication of spinal fusion that can necessitate further surgical intervention and adversely affect outcomes.

#### **METHODS:**

MEDLINE literature search.

#### **RESULTS:**



The most common abnormal finding at the adjacent segment is disc degeneration. Biomechanical changes consisting of increased intradiscal pressure, increased facet loading, and increased mobility occur after fusion and have been implicated in causing adjacent segment disease. Progressive spinal degeneration with age is also thought to be a major contributor. From a radiographic standpoint, reported incidence during average postoperative follow-up observation ranging from 36 to 369 months varies substantially from 5.2 to 100%. Incidence of symptomatic adjacent segment disease is lower, however, ranging from 5.2 to 18.5% during 44.8 to 164 months of follow-up observation. The rate of symptomatic adjacent segment disease is higher in patients with transpedicular instrumentation (12.2-18.5%) compared with patients fused with other forms of instrumentation or with no instrumentation (5.2-5.6%). Potential risk factors include instrumentation, fusion length, sagittal malalignment, facet injury, age, and pre-existing degenerative changes.

#### **CONCLUSION:**

Biomechanical alterations likely play a primary role in causing adjacent segment disease. Radiographically apparent, asymptomatic adjacent segment disease is common but does not correlate with functional outcomes. Potentially modifiable risk factors for the development of adjacent segment disease include fusion without instrumentation, protecting the facet joint of the adjacent segment during placement of pedicle screws, fusion length, and sagittal balance. Surgical management, when indicated, consists of decompression of neural elements and extension of fusion. Outcomes after surgery, however, are modest

[Spine \(Phila Pa 1976\)](#). 2007 Sep 15;32(20):2253-7.

**Adjacent segment disease following lumbar/thoracolumbar fusion with pedicle screw instrumentation: a minimum 5-year follow-up.**

[Cheh G<sup>1</sup>](#), [Bridwell KH](#), [Lenke LG](#), [Buchowski JM](#), [Daubs MD](#), [Kim Y](#), [Baldus C](#).

#### **Author information**

#### **Abstract**

#### **STUDY DESIGN:**

Retrospective radiographic outcomes analysis.

#### **OBJECTIVE:**

We had 3 hypotheses: 1) a longer fusion; 2) a more proximal instrumented vertebra, and 3) circumferential fusion versus posterior-only fusion would increase the likelihood of adjacent segment disease (ASD).

#### **SUMMARY OF BACKGROUND DATA:**

The literature analyzing risk factors, prevalence, and presentation of patients with ASD is varied and without clear consensus.

#### **METHODS:**

A total of 188 patients with minimum 5-year follow-up who had lumbar/thoracolumbar fusion with pedicle screw instrumentation for degenerative disorders were included. Radiographic ASD was defined by: 1) development of spondylolisthesis >4 mm, 2)

segmental kyphosis >10 degrees , 3) complete collapse of disc space, or 4) more than 2 grades worsening of Weiner classification. Clinical ASD was defined as 1) symptomatic spinal stenosis, 2) intractable back pain, or 3) subsequent sagittal or coronal imbalance.

**RESULTS:**

Radiographic ASD occurred in 42.6% (80 of 188) of patients. Patients with radiographic ASD had worse Oswestry scores (20.3 vs. 12.5; P = 0.001) at ultimate follow-up than those without ASD. Clinical ASD developed in 30.3% (57 of 188) of patients. Clinical ASD manifested as spinal stenosis (n = 47), instability-type back pain (n = 5), and sagittal or coronal imbalance (n = 5). Age at surgery over 50 years and length of fusion were significant risk factors for the development of ASD in the lumbar spine. Fusion to L1-L3 proximally increased the risk of ASD when compared with L4 and L5. Circumferential fusion versus posterior fusion was not a significant factor in the development of ASD.

**CONCLUSION:**

Patients over the age of 50 were at higher risk of developing clinical ASD than those 50 years old or younger. Length of fusion was a significant risk factor in the development of ASD in the lumbar spine. Fusion up to L1-L3 increased the risk of ASD when compared with L4 and L5. Circumferential fusion, as opposed to posterolateral fusion, was not a statistically significant risk factor for the development of ASD.

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