Adverse events in adult spinal deformity procedures.

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Introduction

Surgical correction of adult spinal deformity is usually associated with a high complication rate (up to 40%) and a revision rate up to 25%.

This study investigates the relationship between surgical strategies and early adverse events (AE) in a retrospective review of multicenter prospective database.

Material & Method

- Retrospective review of an international prospective database
- 72 patients with adult degenerative scoliosis or kyphosis
- Treated between 2012 and 2014 in 4 centers (Fr, UK, USA x2)
- 62 reaching their 6 months follow-up were eligible for analysis
- **Data collected** : demographics, surgical metrics, complications and revisions, baseline and 3-6 months X-rays, ODI and SRS-22 at each visit.

Material & Method

Patients were divided in 2 groups:

The AE group (n=22)
Those who experiences peri/post-operative complication (n=17) and/or revision (n=5)

The noAE group (n=40)

Patients with no peri/post-operative AE and no additional surgery.

Chi-square and unpaired t-test analysis with a 0.05 level of significance were used for group comparisons.

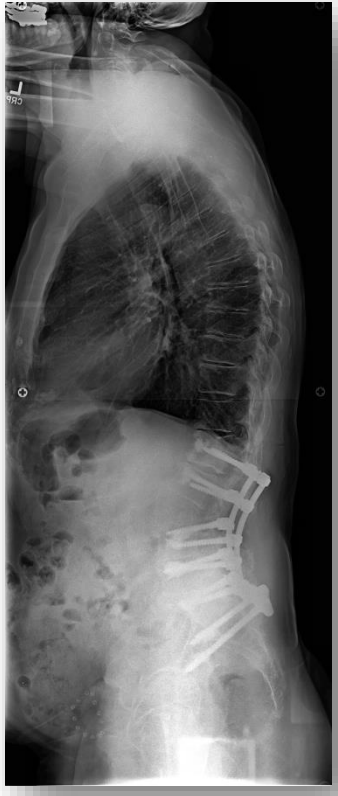
Adverse events group had the following complications:

3 neurologic, 2 implant, 2 DVT, 1 renal failure, 1 prolonged stay, 1 epidural hematoma, 1 infection, 1 pulmonary, 1 PJK, 1 readmission for rehab, 3 other

Results : Demographics

- **Cohort**
  - Age: 61yo (±11.7)
  - BMI: 26 Kg/m^2(±4)
  - 76.7% of Female (n=46)
  - 38.3% of revision surgery (n=23)

- **No Significant difference between groups in terms of:**
  - Demographics
    - age, BMI, gender distribution, incidence of smokers, workers and exercisers
  - Primary vs revisions cases
  - Surgical Strategy
    - number of level fused, number of osteotomies, interbody fusion and autograft
  - Radiographic parameters (baseline and correction)
  - Baseline clinical outcomes



Results : surgical metrics

Surgical metrics	Adverse events	No Adverse events	*P Value*
BMP	**77.2%**	22.7%	0.018
Allograft	41%	**59%**	0.009
DBM	22.7%	**77.2%**	0.001
Approach	40.9% ALIF	**70% DLIF**	< 0.05

46% of patients who didn't have sacral fixation had adverse events.
Whereas, only 19% of patients with sacral fixation had adverse events.
(P = 0.029)

Results : surgical metrics

- What is different ?

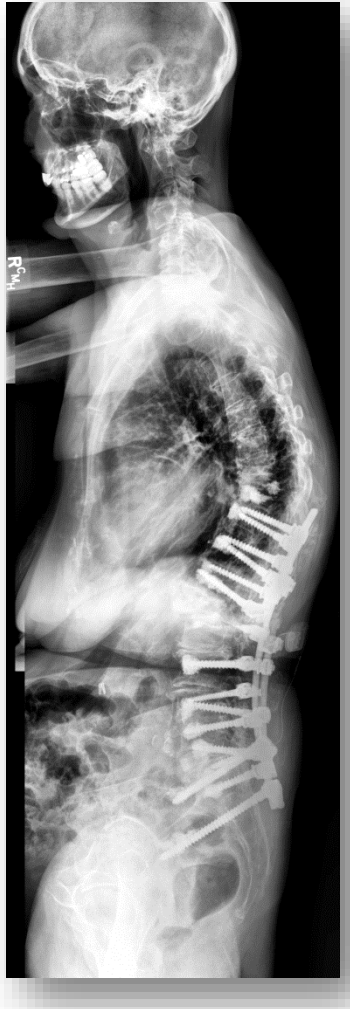
  Patient with adverse events had :

  Significantly more operative time: 374 vs. 257 min p = 0.003

  Comparable blood loss: 1021 vs. 819 ml p = 0.213

  Significantly more correction time 34.8 vs. 18.1 min p = 0.000

  Significantly more length of stay in the hospital: 21.4 vs. 8.6 days p = 0.023



Results : HRQL and sagittal correction

- Adverse events had no impact on clinical outcomes improvement between baseline and 6-month follow up

- 100% of patients with no adverse events had good **sagittal** alignment (SVA<50mm) P = 0.000

- 86% of patients with no adverse events had good **coronal** and **sagittal** alignment combined P = 0.007

Limits

Small cohort

Short follow-up, only early complications and revisions

=> follow-up continuing to 2 years

Conclusion

The AE group was more likely to receive BMP and less likely to receive DLIF, or have a fusion extend to the pelvis

Furthermore patients with AE were less likely to reach an SVA < 50mm

This study demonstrates that surgical metrics, particularly the fusion approach, length of instrumentation and achievement of a balanced spine significantly influence adverse event occurrence.

Disclosures

Evalina L Burger	Medtronic (a) Medicrea (a,b) Paradigm Spine (b) Signus (b) X-Spine (b) Orthofix (a,b) Kensey Nash Corp (b) Aesculpa (a) SI Bone (a) Vertiflex (a) Synthes (a) Integra (a)
Michael S Chang	Stryker (b) Integra Stryker Medtronic (d)
Sean Molloy	Medtronic (a) Zimmer(b) K2M(b)
Vincent Fière	Medicrea (a,e) Clariance (a,e)

a. Grants/Research Support
b. Consultant
c. Stock/Shareholder
d. Speakers' Bureau
e. Other Financial Support