Third Annual Cardiff Spinal Surgery Research Symposium
Holiday Inn, Cardiff
Friday July 12th 2024

Attendees:
Mr Michael McCarthy Consultant - Host
Mr Stuart James Consultant (CO)
Mr Iqroop Chopra Consultant
Mr John Howes Consultant
Mr Alexander Durst Consultant
Prof Sashin Ahuja Consultant – afternoon (Clinic am)
Mr Khaled Badram Consultant – afternoon (Theatre list)
Mr Savi Prakash Consultant – evening only (On call)
Mr Taofeek Adeyemy Spinal Fellow
Mr Munyaradzi Muyengwa Spinal Fellow (CO)
Mr Ramakrishna Bethanabatla Spinal Fellow – evening only (On call)
Dr Amir Khadmy Visiting Spinal Fellow – evening only
Mr Ullas Jayaraju SpR (CO)
Mr Sasan Dehbozorgi SpR (CO)
Mr Dmitri Shastin SpR - afternoon (Theatre list)
Mr Antonio Riccioli Directorate Manager (CO)
Mr Matthew Williams Research – Judging the Presentations
Ms Kayleigh Duval Research – Judging the Presentations
Ms Abi Peacham Research – Judging the Presentations
Ms Heather Jarvis Research – Judging the Presentations
Ms Lizzy Jones Surgical Care Practitioner
Mr Louis Clayton Medical Student
Ms Christina Sam Medical Student
Ms Sophie Griffiths Medical Student
Ms Sanya Trikha Medical Student
Mr Ronan McKeogh Medical Student
Mr Rajib Ahmed Medical Student
Mr Siddhanth Kachroo Medical Student
Ms Samantha Todd Medical Student
Ms Medha Raketla Medical Student
Ms Ghazal Motazedian Medical Student
Ms Maria Lofthouse Medical Student
Mr Niduk Don Medical Student
Mr Agbo Pethiyagoda Medical Student
Ms Eleri James Medical Student
Ms Anna Jones Medical Student (CO)
Ms Diya Desai Medical Student (CO)
Ms Julie Matthew Medical Student (CO)
Ms Meysun Odoncu

Sponsors:
Globus Medical
Silony Spine
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Paradigm Spine

(CO – conference only)

Third Annual Cardiff Spinal Surgery Research Symposium
Holiday Inn, Cardiff
Friday July 12th 2024

0930: Registration

1000: Session 1

1000: Mr Michael Mccarthy Consultant Spinal Surgeon: Welcome and Introductions

1015: Mr Rajib Ahmed 3rd Year: Scoring Systems For Surgical Intervention Of Degenerative Spondylolisthesis - A Retrospective Study

1030: Ms Ghazal Motazedian 3rd Year: Epidural Fibrosis Following Primary Microdiscectomy

1045: Ms Anna Jones 4th Year: Surgical Management Of Facet Joint Cysts: A Retrospective Analysis And Comparison Of The Two Main Operative Techniques

1100: Mr Niduk Don 3rd Year: The Spine For Medical Students

1115: Mr Siddhanth Kachroo 4th Year: Perioperative Outcomes And Segmental Angle Changes Following Primary L5/S1 Fusion: A Retrospective Comparison Of ALIF Vs TLIF Vs PLIF Vs PLF Techniques

1130: Ms Eleri James 3rd Year: The Impact Of Body Mass Index On Post-Operative Outcomes For Chiari Malformation Patients Who Underwent Foramen Magnum Decompression.

1145: Ms Maria Lofthouse 3rd Year: Revision Rates And Complications Following Surgery For Cervical Myelopathy Over A 10-Year Period

1200: Buffet Lunch in Restaurant

1300: Session 2

1300: Mr Munyaradzi Muyengwa Spinal Fellow: Pre-Contoured Vs Surgeon Contoured Rod Implants In Adolescent Idiopathic Scoliosis Surgery – Operative Outcomes

1315: Ms Medha Raketla 3rd Year: Systematic Review And Meta-Analysis Of Adjacent Segment Disease And Revision Rates Following Cervical Disc Replacement Compared To Fusion

1330: Ms Sanya Trikha 4th Year: Impact Of Cervical Spine Fixation On Patient's Long Term Employment: Cohort Study

1345: Mr Louis Clayton 3rd Year: Open Versus Minimally Invasive Pedicle Screw Fixation For Thoracolumbar Fracture Fixation

1400: Ms Samantha Todd 3rd Year: Comparing The Radiation Dose For L1-S1, Nerve Root Blocks Between Surgeons And Radiologists In The Private Sector And NHS

1415: Ms Sophie Griffiths 3rd Year: A 10-Year Analysis Of Pedicle Screw Placement In The Surgical Treatment Of Adolescent Idiopathic Scoliosis

1430: Mr Taofeek Adeyemi Spinal Fellow: Epidemiological And Clinical Characteristics Of Patients With Spinal Tuberculosis At A Regional Spine Centre In South-West Nigeria

1445: Mr Agbo Pethiyagoda 3rd Year: Evaluating Outcomes, Revision Rates, And Need For Metalwork Removal In Primary Spinal Infection Surgeries That Has Had Metalwork Treatment: A 10-Year Analysis

1500: Break and Refreshments

1530: Session 3

1530: Mr Sasan Dehbozorgi SpR: Standardised Admission Proforma In Spine Surgery

1545: Ms Julie Mathew 3rd Year: A Retrospective Comparative Study Using The Modified 5-Item Frailty Index In Patients Aged Below And Above 65 As A Predictor Of Post-Operative Complications In Lumbar Degenerative Spine Surgery

1600: Ms Christina Sam 4th Year: Assessing The Unfused Distal Lumbar Segments Post-Posterior Correction And Fusion In Adolescent Idiopathic Scoliosis

1615: Ronan Mckeogh 3rd Year: Does Corrective Surgery For Paediatric Spinal Deformity Affect Later Obstetrical Outcomes?

1630: Ms Sophie Griffiths 3rd Year on behalf of Ms Ella Clifford Spence 4th Year: Comparison Of Freehand Screw Placement And 3D Printed Guides In Paediatric Scoliosis Surgery

1645: Mr Dmitri Shastin SpR: Modelling Intracranial Gene Therapy Delivery In Huntington's Disease

1700: Break and Judges Marking

1730: Award for Best Presentations – 3rd Year / 4th Year / Spinal Fellow SpR

1800: Depart

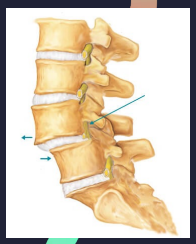
1930: Meet at Wahaca Restaurant, St Davids Centre (meal at 2000)

SCORING SYSTEMS FOR SURGICAL INTERVENTIONS OF DEGENERATIVE SPONDYLOLISTHESIS – IS THERE A PLACE FOR THEM?

Rajib Ahmed and Mr Francis Brooks
3rd Year Medical Student

3rd Cardiff Spinal Surgery Research Sympsosium

1



Introduction

- Degenerative spondylolisthesis (DS) is a common spinal pathology affecting patients later in life[1]
- Most commonly occurs in the L4/L5 region[2]
- Occurs due to aging processes that weaken the spine[3]
- Various different interventions exist to help treat DS – Decompressions, Interbody fusions, posterior fusions, etc.[5]

2

How do we know when to use different interventions?

There are no established guidelines or scoring systems to make these decisions.

3

Literary Review

Identified two novel potential scoring systems that aim to suggest surgical interventions for DS

1. University of California San Francisco Degenerative Spondylolisthesis (UCSF DS) classification system[4]
2. Degenerative Spondylolisthesis Instability Classification (DSIC)[7]

UCSF DS SCORING SYSTEM*

Parameter	Decompression Alone	Decompression + PF	Decompression +PF+ LIF
Primary Clinical Presentation	Primarily Leg Pain	Both Leg and Back Pain	Primarily Back Pain
Disc Angle	Lordotic Disc Angle or <5mm of translation	Neutral Disc Angle or 5-5 mm of translation	Kyphotic Disc Angle or >5mm of translation
Joint Effusion	No Facet Joint Effusion	Facet Joint Effusion without joint distraction	Large facet joint effusion
Rantebilitation	Grossly narrowed disc height	Reduced Disc Height	Normal to slightly reduced disc height

DSIC SCORING SYSTEM*

Parameter	Type 1 - Stable Decompression Alone	Type 2 - Potentially Unstable Decompression + PF	Type 3 - Unstable Decompression +PF+LIF
Low Back Pain	None or Very Mild	Primary/Secondary Complaint	Primary/Secondary Complaint
Disc Angle	Lordotic Disc Angle or <5mm of translation	Neutral Disc Angle or 5-5 mm of translation	Kyphotic Disc Angle or >5mm of translation
Joint Effusion	No Facet Joint Effusion	Facet Joint Effusion without joint distraction	Large facet joint effusion
Rantebilitation	Grossly narrowed disc height	Reduced Disc Height	Normal to slightly reduced disc height

4

Testing the scoring systems with a retrospective study

USING THE CARDIFF SPINAL DATABASE OF OVER 7000 CASES

5

Methodology

Retrospectively apply both scoring systems to DS cases affecting the L4/L5 region and compare the suggested interventions with ones performed

F1 Scoring	Estimations
A measure of predictive performance – the average between precision and recall	Calculated if the scoring system suggested more invasive surgical methods (overestimations), less invasive (underestimations) or if the system matched the performed surgery.

6

Results

F1 Scoring

- UCSF DS performed better in this metric with an F1 of 0.438, compared to DSIC with 0.371

Scoring System	Underestimations	Overestimations	Exact Match
DSIC	23.6%	39.3%	31.1%
UCSF DS	41.6%	14.6%	43.8%

Underestimations indicate that a less invasive surgical interventions could have been used

7

Analysis and Conclusion

UCSF DS displayed potential to be used as a system to suggest surgical interventions in DS

Further analysis of the application of scoring systems would prove its efficacy

Further development and improvement of the scoring systems is necessary to cover all possible cases

8

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9

Acknowledgements

Mr Francis Brooks and Mr Michael McCarthy for their guidance throughout the project.

10

THANK YOU!

DO YOU HAVE ANY QUESTIONS?

11

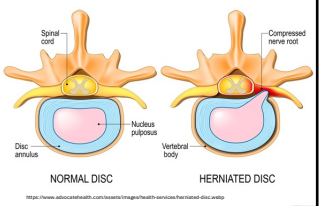
Epidural fibrosis following primary microdiscectomy

Ghazal Motazedian, Mr Alexander Durst
Cardiff School of Medicine

1

Background

- Disc herniation happens when the annulus fibrosus weakens and develops a tear, through which the nucleus pulposus can bulge and compress nearby nerve roots.
- Surgical management involves discectomy to remove the herniated disc.



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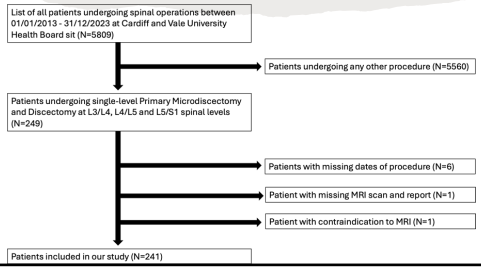
Methodology

Figure 1: Flowchart summarizing the inclusion criteria for our study.



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Results

- 46.5% (N=112) of patients experienced recurrent symptoms following surgery.
- 95.5% (N=107) of these patients had recurrent disc herniation (RDH), equating to an overall incidence of 44.4% of RDH following primary discectomy.
- 19.1% (N=46) of patients were found to have epidural fibrosis as identified on MRI.
- The incidence of revision surgery was 20.3% (N=49) of which 93.9% (N=46) was due to RDH.
- 46.9% (N=23) of those who underwent revision surgery had no epidural fibrosis whereas 53.1% (N=26) did.

Year	Number Of Patients	Repeat MRI	RDH	Epidural Fibrosis	Revisions
2013	27	14	13	5	3
2014	28	7	7	3	3
2015	35	18	18	8	9
2016	34	23	21	10	8
2017	26	16	16	8	7
2018	17	9	8	4	5
2019	16	3	3	2	0
2020	16	9	8	3	8
2021	18	3	3	0	1
2022	12	4	4	1	1
2023	12	6	6	2	4

Table 1: Patients in our inclusion criteria, highlighting repeat MRIs, Recurrent Disc Herniation (RDH), Epidural Fibrosis and Revisions post-surgery (n=241).

	Epidural Fibrosis (NO)	Epidural Fibrosis (YES)
Patients who had revision	23	26

Table 2: The number of patients undergoing revision surgery with/without Epidural Fibrosis

4

Discussion

- 19 out of 100 patients are likely to develop epidural fibrosis following primary microdiscectomy.
- Across the 10 years, there was a sharp decrease in the incidence of epidural fibrosis as shown in Figure 2.
- Pearson correlation coefficient of -5.63.
- In 20 out of 100 patients undergoing revision surgery, a Chi-squared test was carried out to determine whether epidural fibrosis significantly affected the occurrence of revision surgery.
- A P-value of 1 was obtained, concluding that there is no association between the two.

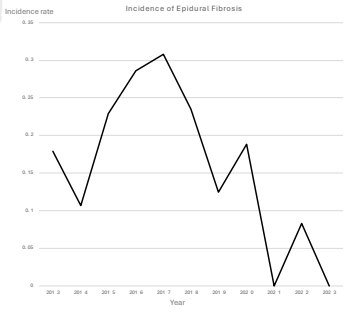


Figure 2: The incidence of Epidural Fibrosis identified on MRI scans following single-level primary microdiscectomy/discectomy (L3/L4, L4/L5, L5/S1) across 10 years (2013-2023) (n=241)

5

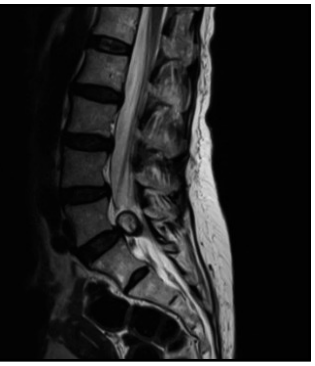
Conclusion

The prevalence of epidural fibrosis has significantly reduced in the last 7 years.

Further investigations into minimizing post-operative complications will help reduce the incidence of revision surgery, ultimately improving patient welfare and clinical effectiveness

6

Surgical management of facet joint cysts:
a retrospective analysis & comparison of the two main operative techniques



A.P Jones[1], Mr. M McCarthy[2]

1 Cardiff University Medical School

2 University Hospital Wales, Department of Spinal Surgery

1

Context

- Segmental instability leads to degenerative changes in the facet joints, leading to the formation of facet cysts[1-3]
- With poor responses to conservative treatment[4], a significant portion of symptomatic facet cysts warrant surgical excision either by:

  Decompression-alone or decompression and fusion
- **However, it is not clear which technique should be adopted as a first-line option**

2

A summary of the available literature

	Decompression-alone	Decompression-fusion
Pros	'Less invasive' Fewer complications & blood loss intra-operatively[5]	Possibly more effective in reducing back pain & radiculopathy post-operatively[1,5,7] Lower incidences of cyst recurrence[1,5,7]
Cons	Cyst recurrence – potential to "unmask latent instability"[6,7]	Complications – dural tears, CSF leaks, VTE, wound infection, blood loss[5] Possibility of instigating adjacent segment disease (ASD)[8-11]

3

Objective

- Investigate the factors associated with the development of facet cysts: sagittal **orientation** of the facet joint, presence of **spondylolisthesis,** the **spinal level** in which they develop
- Compare decompression-alone and decompression-fusion in terms of
  - symptom **resolution**
  - intra-operative **complications**
  - cyst **recurrence** & **revision rate**

4

Methodology

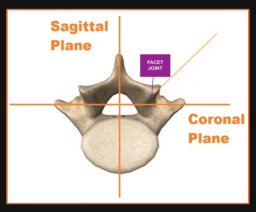
- 47 patients with symptomatic FJCs were selected out of 4,967 spinal operation notes documented on *Bluespier* from 01/01/2014 – 01/01/2024 (**10 years**)
- Synapse PACS was used to assess pre-operative MRI scans:
  - Angle of the facet joint
  - Spondylolisthesis (Meyerdig classification)
  - Effusion within the facet joint
  - % canal compromise
- Operation notes & clinic notes
  - Symptoms pre- and post- op
  - Complication rate
  - Revision rate
  - Cyst recurrence

  } Decompression alone Vs Decompression-fusion

5

Results

- Mean age: 64.03 ± 12.334 (range 86 – 18)
- 59.6% (n = 28) were female, 40.4% (n = 19) were male
- Cysts occurred most commonly at L4/5 (51.1%, n = 24)
- 35.7% had low-grade spondylolisthesis (grade 1)
- Facet angles at L4/5 were **more sagittal** in orientation compared to healthy patients in a different study by Mohanty et al.[12] **(p = .0001)**



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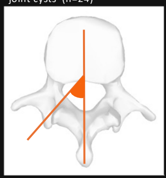
Facet joint orientation

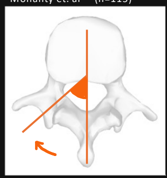
Our study: patients with facet joint cysts (n=24)



41.71° ± 10.929

P = .0001

Healthy patients in a study by Mohanty et. al [12] (n=115)



48.32° ± 6.38

7

Results

- 51% (n = 24) had decompression-alone; 49% (n = 23) had fusion
- All incidences of dural tears and CSF leaks were in the fusion group
- Those undergoing fusion tended to lose greater volumes of blood intra-operatively
- Supports the notion that fusion carries a greater risk of complications compared to decompression-alone

	Decompression-alone (n)	Decompression-fusion (n)	*P*
Total	**24**	**23**	-
Dural Tear	0	3	.070
CSF leak	0	1	.312
Blood loss (ml)			<.001*
<200	20	5	
200-500	3	11	
500–1,000	1	7	

8

Post-operative outcomes

- 43 patients available for follow-up; 3 patients died; one patient had no documentation available

	Decompression-alone (n)	Decompression-fusion (n)	*p*
Total	**21**	**22**	-
Radiculopathy (at follow-up)	8 (38%)	10 (45.4 %)	**.625**
Back pain (at follow-up)	9 (42.8 %)	10 (45.4 %)	**.864**
Revision needed	2 (9.5 %)	3 (13.6 %)	**.674**
Cyst recurrence	1 (4.8 %)	0	**.300**

No significant difference in post-op outcomes between decompression-alone and decompression fusion

9

What does this suggest?

1. Decompression-alone should be a first-line option in the management of symptomatic facet joint cysts
2. Presence of spondylolisthesis or other markers of instability should not necessitate fusion
3. Fusion can always be carried out at a later date e.g., should the facet cyst recur

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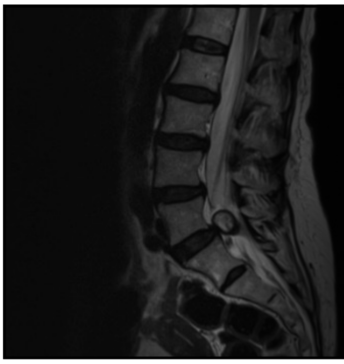

Thank you!
Any questions?

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- https://geekymedics.com/the-vertebral-column/

12

The Spine For Medical Students

Niduk Kalu Arachchige Don, Ella Hawes, Samantha Todd, Mr Michael J H McCarthy

1

Introduction

Our objective is to create a textbook which acts as a comprehensive and accessible guide about the spine for medical students

Our target audience is medical students

2

Why is this needed?

The spine is one of the most poorly covered areas in the UK medical schools' curriculums

There is a growing incidence of back problems in the general population, but there is a shortage of spinal surgeons.

3

Background Research

- Initially, we spent a few weeks planning the table of content
- To ensure that the book content covered all important aspects of the spine, we did the following:

1. Review of currently available literature
2. We reviewed the newest UKMLA guidance.
3. We included additional topics to help provide a deeper understanding of spinal health.

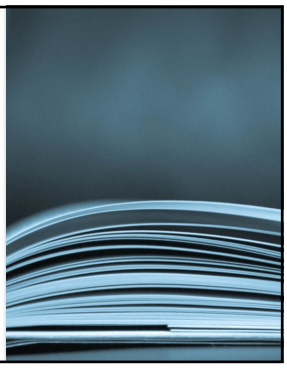

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Table of Content

- The book consists of four main sections:
  - ❖ Section 1: Introduction to the Spine
  - ❖Section 2: Spinal Conditions
  - ❖Section 3: Applied Knowledge
  - ❖Section 4: Supplementary Material

5

Section 1: Introduction to the Spine

The section of the book will cover the basics of the spine

This section starts with the embryology and anatomy of the spine

The section ends with two chapters on taking a spinal history and doing a spinal examination respectively

6

Section 2: Spinal Pathology

- During the initial planning phase of the book, we came up with a format that we can apply for all the spinal pathology as shown.
- Our aim was to convey all the important information while ensuring that it is not too information-dense for our readers

4. Torticollis

Pathophysiology:
Torticollis, also called wry neck, is a condition affecting the neck muscle where the neck becomes twisted on one side. This can be congenital or acquired due to trauma or neuromuscular dysfunction.

Causes:
- Congenital torticollis
  - due to shortening and tightening of the sternocleidomastoid muscle
- Trauma
- Dystonia
- Muscle spasm

Clinical Features:
- Unilateral neck deviation with pain on the affected side
- Limited range of neck movement
- Tenderness
- Headache

Diagnosis:
- Diagnosis is often clinical once more serious causes are excluded

Investigations:
- Investigations are not normally required for patients with acute torticollis but may include serology and imaging

Radiology:

Management:
- Oral analgesics for pain relief
- Physiotherapy
- General advice and information

7

Section 3: Applied Knowledge

- The book's third section consists of a section with single-best-answer-styled questions.
- This allows the readers to apply the knowledge they gain to realistic clinical scenarios through these questions.

- A 30 year old diabetic male presents to his General Practitioner with a 2 day history of severe neck pain, fever, altered sensation in his hands and difficulty with coordination and dexterity. Which condition needs to be ruled out urgently?

A. Diabetic peripheral neuropathy
B. Diabetic ketoacidosis
C. Cervical epidural abscess
D. Cervical myelopathy
E. Transverse myelitis

8

Section 4: Supplementary Material

- The fourth and final section of the book will contain additional material to complement the reader's learning further
- This includes videos showing a step-by-step demonstration of all the clinical examinations relevant to the spine.

9

Slide 5: Plans for the Future

- We hope to complete the book by the end of the next academic year
- Once complete, we hope to publish this textbook in the form of a PDF as an e-book on Amazon

10

Thank You For Listening

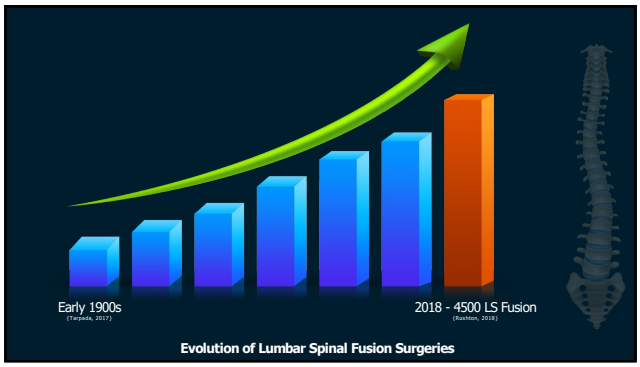
Any Questions?

11

Perioperative Outcomes and Segmental Angle Changes following Primary L5/S1 Fusion: A Retrospective Comparison of ALIF vs TLIF vs PLIF vs PLF Techniques

Siddhanth Kachroo, Mr. Michael J. McCarthy

1



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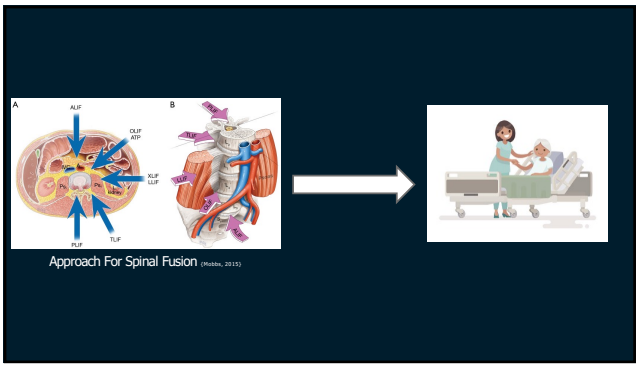

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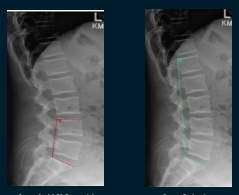
Primary Aims

- Peri-operative Outcomes and Re-operation Rates
  - Intra-operative Complications
  - Post-operative Complications
  - Return to Theatre
  - Secondary Lumbar Surgery/ Revision
- Segmental Angle Changes



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Inclusion Criteria

All Spinal Procedures in C&V UHB 2013-2022 *(n=5430)*

ALIF	"Lumbar Stabilisation"
TLIF	"Lumbar Stabilisation with Instrumentation"
PLIF	"Surgery to Lumbar Spine"
PLF	"Spinal Fusion"
	"Surgery to the Spine"

Spinal Fusion Procedures *(n=892)*

+ Isolated L5/S1 Fusion
+ Primary L5/S1 Fusion
+ All indications except Spinal Deformities

L5/S1 Fusion Procedures *(n=153)*

- Inadequate Surgical/Radiology Data

L5/S1 Fusion Procedures *(n=115)*

- ALIF *(n=30)*
- TLIF *(n=54)*
- PLIF *(n=23)*
- PLF *(n=8)*

5

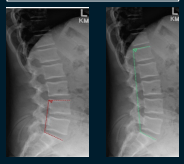
Data Collection

- Porth Clinigol Cymru Welsh Clinical Portal
- SYNAPSE 5
- Bluespier — Award-winning, clinical solutions
- X
- SPSS

6

Data Collection – Lumbar XR

Pre-op XR vs Most Recent XR



? Change in Angle

7

Results

Overview of the Data

- 53% *(n=61)* of the patients were female and 47% *(n=54)* were male. The patient retention rate was determined by identifying patients seen in the Welsh National Health Services within the last 12 months was 83% *(n=96)*
- Most common primary indication for surgery across all four surgical techniques included spondylolisthesis *(n=43)* followed by radiculopathy *(n=34)*, disc disease *(n=29)*, degenerative spinal disease *(n=5)* and lumbar stenosis *(n=4)*

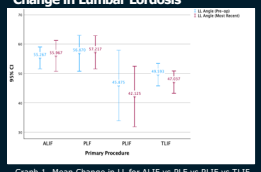
Peri-operative and Re-operation Rates

	Peri-operative Complications	Secondary Lumbar Surgery
ALIF	5	5
PLIF	0	0
PLF	4	1
TLIF	8	8

8

Results

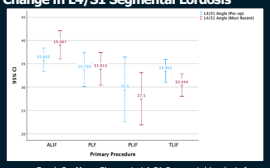
Change in Lumbar Lordosis



Graph 1- Mean Change in LL for ALIF vs PLF vs PLIF vs TLIF

	Change (°)
ALIF	+0.70
PLF	+0.35
TLIF	-2.56
PLIF	-3.75

Change in L4/S1 Segmental Lordosis



Graph 2 - Mean Change in L4-S1 Segmental Lordosis for ALIF vs PLF vs PLIF vs TLIF

	Change (°)
ALIF	+3.23
PLF	+0.17
PLIF	-2.00
TLIF	-3.02

9

Analysis

In our study, the type of spinal fusion performed did not show statistically significant differences in perioperative outcomes or rates of subsequent lumbar surgery following an isolated, primary L5/S1 fusion *(p>0.05)*

Our analysis also found no statistically significant difference in lumbar lordosis change across the four surgical techniques *(p>0.05)*

Our study revealed statistically significant difference *(P=0.002)* in L4/S1 segmental lordosis change with data indicating that ALIF was associated with the greatest increase following fusion (+3.23°) and TLIF was associated with the greatest decrease following fusion (-3.02°)

10

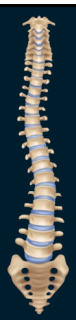
Discussion

Literature data aligns with our results with one study reporting greater L4/5 and L5/S1 segmental lordosis in ALIF compared to TLIF/PLIF. The same study observed that there was no significant difference for overall lordosis L1-S1compared with pre-operative measurements {O'Connor, 2022}

A recent study comparing re-operation rates for symptomatic ASD among ALIF vs PLIF vs TLIF patients undergoing lumbar fusion reported no differences in re-operation rates for patients with symptomatic ASD {Bains, 2024}

A meta-analysis performed in 2022 comparing complications following ALIF/TLIF/PLIF in patients undergoing lumbosacral fusion reported higher complications and perioperative mortality with ALIF {Lenz, 2022}

11



THANK YOU!

Special thanks to Mr. McCarthy for his guidance and support throughout this project

12

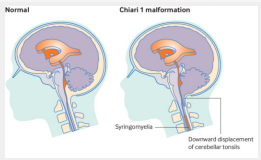
BMI & outcomes of Foramen Magnum Decompression

The impact of body mass index on post-operative outcomes for Chiari malformation patients who underwent foramen magnum decompression

ELERI JAMES 4TH YEAR SSC STUDENT
MR RON VED, WILL JOHN, MR R NANNAPANENI

1

Chiari and Syrinx



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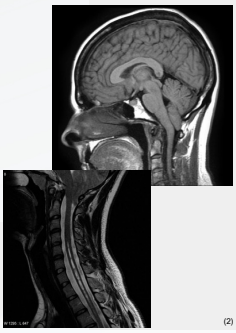


Syrinx, describes a fluid-filled cyst occupying the central canal of the spinal cord.

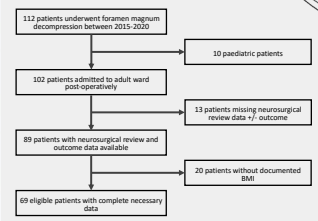
Hypothesised to be caused by change of CSF dynamics, due to overcrowding at the foramen magnum.

(2)

2

Methods

- Retrospective cohort analysis of 69 patients who underwent foramen magnum decompression
- Comparing outcomes between **obese** and **non-obese** patients
- University Hospital Wales; 2015-2020
- Two-sided Fisher's exact test



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Demographics

	Total (n=69)	Obese (n=34)	Not obese (n=35)
Age (years)			
Mean (SD)	38 (12)	36 (10)	38 (13)
Range	16-70	23-56	16-70
BMI			
Mean (SD)	31 (8)	37 (6)	26 (3)
Range	17-56	30-56	17-30
Sex (%)			
Male	12 (17%)	3 (9%)	9 (26%)
Female	57 (83%)	31 (91%)	26 (74%)

4

Results

	% Obese patients	% Patients who were not obese	P- value
Isolated Chiari			
Chiari with Syrinx			
Initial improvement			
Post-operative complications			
Acute complications in hospital			
Complete resolution of symptoms at OP review			
Readmission to Hospital			

5

Discussion

Our study showed clear trends between obesity and less favourable post operative outcomes

No existing literature specifically on post-op outcomes for FMD in obese patients

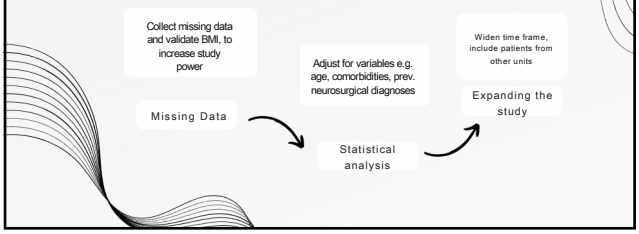
Confirming trends could aid in patient selection/counselling for surgery

- Small cohort = possibly underpowered
- BMI documentation suboptimal → patients excluded → reduction in power
- ? adjust for more variables (e.g. bony vs dural opening; age, co-morbidities)
  - Analysis of outcome based on bony decompression vs duraplasty = no clear preferable method (consistent w/literature)
- Symptoms / improvement are subjective, → challenging to analyse

6

Next Steps

With thanks Mr R Nannapaneni, Mr R Ved, W John



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8

REVISION RATES AND COMPLICATIONS FOLLOWING SURGERY FOR CERVICAL MYELOPATHY OVER A 10-YEAR PERIOD

MARIA LOFTHOUSE, MR M MCCARTHY, MR A JONES

1

THE AGENDA

- Objectives
- Methods
- Results
- Existing research
- Future of this research

2

OBJECTIVES

- Rates of surgical outcomes
  - Revisions
  - Adverse events
  - Ongoing symptoms
- Pre-operative factors
- Surgical approach

3

METHODS

- BlueSpier Database
- Primary surgeries
- 1st January 2013 to 31st December 2022
- 291 patients

4

METHODS

Symptoms	Medical and surgical history	Shape of cervical spine	Ossification of Posterior longitudinal ligament	Cord signal change
Surgical approach	Spinal levels	Adverse events	Recovery	Revision surgeries

5

RESULTS

- Stage of disease : late-stage most common
- Shape of C-spine : lordotic most common
- 170 ACDF surgeries and 107 posterior surgeries
- 2-spinal-level surgery most common

6

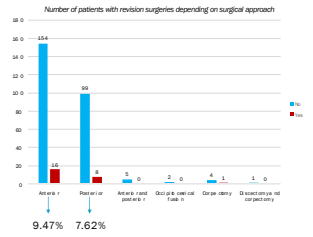
RESULTS

27.84% ongoing symptoms
22.34% adverse events
8.60% revision surgeries

4/2/26

7

RESULTS



9.47% 7.62%

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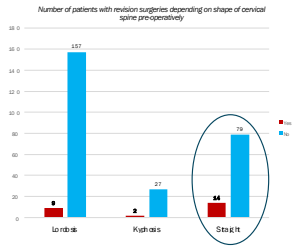
RESULTS



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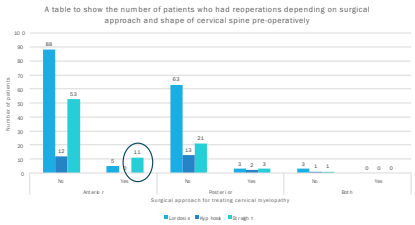
RESULTS



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EXISTING RESEARCH

Rates of complications: 4.4%, 18.7%, 18.7%, 27.1% and 37.5%	[1, 2, 3, 4, 5]
Rates of improvement: 64.1%, 87.6%, 78.3%	[6, 7, 8]
Anterior surgical approaches linked with dysphagia	[1, 9, 10, 11, 12]
Posterior surgical approaches linked with infection	[1, 10, 11, 12 13]
Factors linked with successful outcome	[14]

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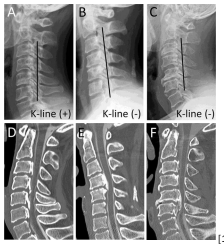
FUTURE OF THIS RESEARCH



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12

QUESTIONS

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13

THANK YOU FOR LISTENING

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14

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16

Pre-contoured vs Surgeon Contoured Rod implants in adolescent Idiopathic scoliosis Surgery- operative outcomes

S Glossop, M Muyengwa, MJH McCarthy, SH James, DA Jones, S Ahuja, J Howes, N Moideen, PR Davies
Cardiff Spinal Unit
Children's Hospital of Wales

Presented by Munyaradzi Muyengwa- Spinal Fellow

1

Disclosure

- The authors confirm that there is no conflict of interest nor funding received for this study

2

Introduction

- pre-contoured rods pros
  - prevent notching
  - thereby likely to prevent rod breakage
- Pre-contoured rods Cons
  - potentially stiffer adding to junctional stress
  - high load to failure
- Intra-op contouring pros
  - reduces fatigue strength
  - endurance limit
  - yield strength and bending stiffness (Ohrt Nissen et al 2018)
- Compare operative outcomes between two teams of dual surgeons regularly using either pre-contoured or conventional rods

3

Aims & Objectives

- Primary
  - ➢ Assess operative outcomes of pre-contoured rods vs surgeon contoured rods
  - Pre vs post-op cobb angles
- Secondary
  - Length of stay post surgery
  - Number of levels
  - Rate of complications/revisions

4

Methodology

- Retrospective, Non blinded
- Single centre, cohort
- Statistics employed SPSS® software

CRITERIA	INCLUSION	EXCLUSION
Research participant	Patients diagnosed with idiopathic adolescent scoliosis, N = 265	Patients with scoliosis related to other causes such as congenital or neuromuscular
Age (at time of procedure)	Patients between the ages of 10 to 18	Patients younger than 10 or older than 18
Timescale	January 2013 to December 2023 (10-year period)	Any operations carried out before or after this period
Operative methods	Posterior surgery, Combined anterior and posterior surgery	Anterior surgery alone

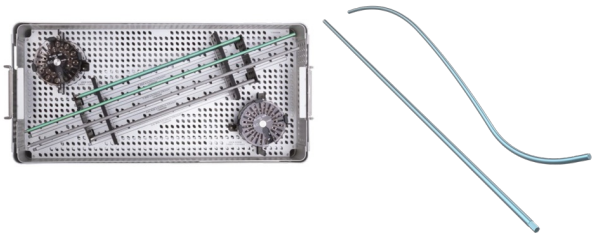
5

Methodology

Pre-contoured rods	Pre-contoured rods	Surgeon Contoured rods
K2M	Amarda Reline Creo	Expedium Bierderman Verse URS/USS

6

Illustration of rod implants



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Results

- Sample size 265
  - 85.3% were female (n=226)
  - 14.7% male (n=39)
- Mean age 14.6 years
  - All patients aged 10-18
- Data for rods available for 255 patients

8

Results

	Pre-contoured	Surgeon Contoured
N	139	116
Days to discharge	6.88	7.08
Number of Levels of Surgery	13.28	13.07

- Mean days till discharge 6.96 days
  - Range 4-38

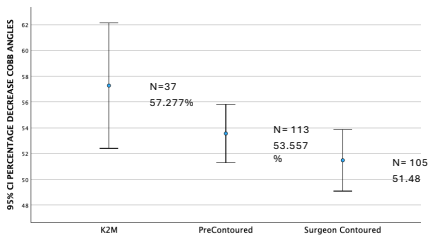
9

Results

	K2M	Pre-contoured	Surgeon Contoured	Overall
Preop cobb	62.54	69.31	69.30	68.33
Post op cobb	26.78	32.50	33.65	32.14
Cobb angle decrease	35.76	36.81	35.66	36.18
Percentage decrease in Cobb	57.277	53.557	51.48	53.24

10

Results



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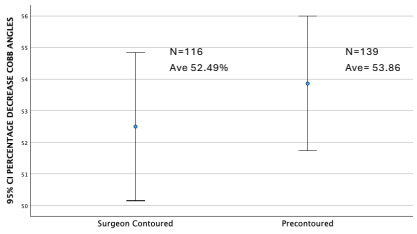
Results



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Complications or revisions

- Overall revision surgery 8.7% (n=23)
  - 11- contoured rods
  - 12 pre-contoured rods

13

Discussion

- No significant statistical difference in percentage decrease in the Cobb angle in AIS surgery
  - Pre-contoured rods remain convenient and user friendly by design
  - Prevent notching
  - Give an idea of what the spine should ideally look like
- Revision rate overall 8.7%
  - Other studies 13.1% and 19% (Kwan, et al, 2020)
- No difference noted in length of stay post surgery and number of levels of surgery

14

Conclusion

- The use of pre-contoured vs surgeon contoured rods does not appear to affect scoliotic Cobb angle improvement following surgical intervention in AIS, likewise no difference noted in length of stay post surgery and number of levels of surgery.
- Further studies
  - Cost of implant per patient
  - rod thickness
  - operating times within a specific team of surgeons

15

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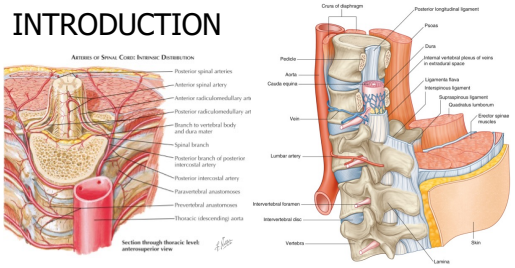
16

A 10-Year Analysis of Pedicle Screw Placement in the Surgical Treatment of Adolescent Idiopathic Scoliosis

Ms Sophie J Griffiths, Mr Michael J McCarthy, Mr Stuart James, Mr Alwyn Jones, Prof Sashi Ahuja, Mr John Howes, Mr Paul Davies, Mr Naz Moideen

1

INTRODUCTION



Adapted from: Arteries of Spinal Cord: Intrinsic Distribution (1)

Arrangement of Structures in the Vertebral Canal and the Back (Lumbar Region) (2)

(1) Netter FH, Jones IER, Machado CAG, Perkins JA. Netter Collection of Medical Illustrations: Nervous System, Part II – Spinal Cord and Peripheral Motor and Sensory Systems

(2) Drake RL, Vogl AW, Mitchell AWM. Gray's Anatomy for Students, 5th ed. Philadelphia, Elsevier Saunders; 2024.

2

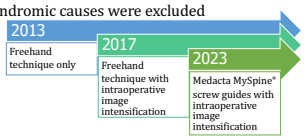
AIMS

1. To determine rates of screw malplacement in adolescent idiopathic scoliosis patients
2. To determine the difference in the number of malplaced screws identifiable on postoperative XR compared to CT
3. To identify the number of patients that underwent revisional surgery

3

METHOD

- Complete list of operations carried out between January 2013 and December 2023 obtained from the Bluespier database
- Inclusion criteria: Children between the ages of 10 and18 that underwent primary instrumented fusion to treat idiopathic scoliosis
  - Neuromuscular, congenital and syndromic causes were excluded
- Radiological imaging stored on the Synapse database interpreted



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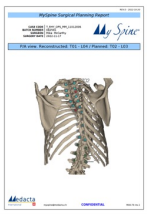
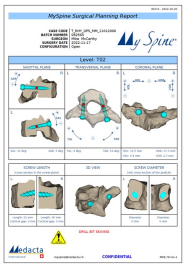
MEDACTA MYSPINE® 3D PRINTED GUIDES





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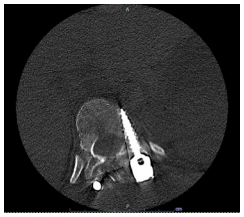
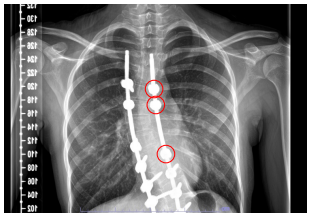
MALPLACED SCREWS IN DIFFERENT IMAGING MODALITIES





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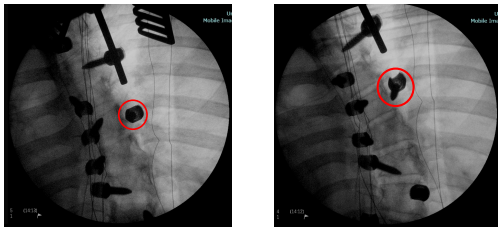
MALPLACED SCREWS IN DIFFERENT IMAGING MODALITIES



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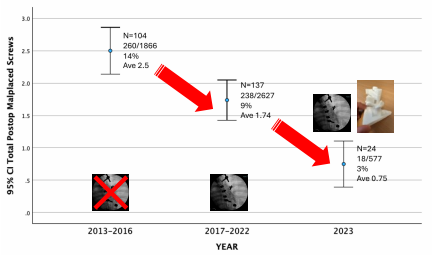
RESULTS

- 226 females and 39 males (N=265) included in the study
- 5070 screws placed
- Average of 19.13 (SD±3.98) screws placed per patient
- Between 11 and 29 screws placed per patient
- 516 (10%) screws malplaced
- Average 1.95 (SD±1.85) screws malplaced per patient
- Between 0 and 8 screws malplaced per patient
- 71% of patients had at least one malplaced screw

8

RATES OF SCREW MALPLACEMENT



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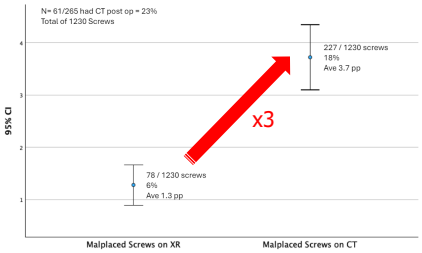
CT VS X-RAY



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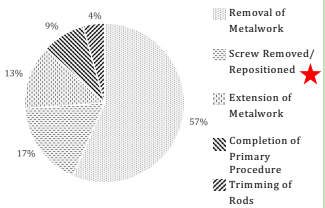
REVISIONAL SURGERY

- 23 (9%) patients underwent revisional surgery
- Average number of months from the date of primary surgery to revision was 27.2 months (SD±26.29)



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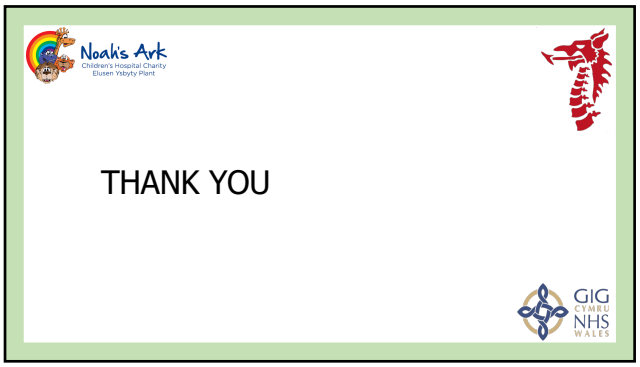
CONCLUSIONS

- MySpine® guides combined with intraoperative image intensification provides the greatest reduction in screw malplacement
- Intraoperative image intensification alone provides a significant reduction in malplacement rate
- CT is a more accurate method of identifying malplaced screws postoperatively

Noah's Ark Children's Hospital Charity Elusen Ysbyty Plant

GIG CYMRU NHS WALES

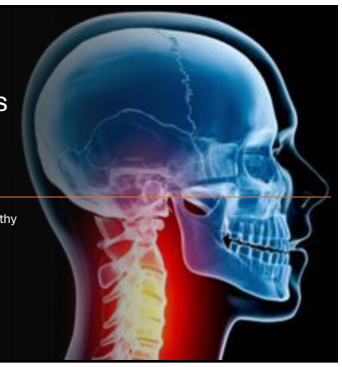
12


Noah's Ark
Children's Hospital Charity
Elusen Ysbyty Plant
THANK YOU
GIG
CYMRU
NHS
WALES

13

Long Term Outcomes of Cervical Fracture Fixation

Sanya Trikha, Lara Green, Micheal J H McCarthy



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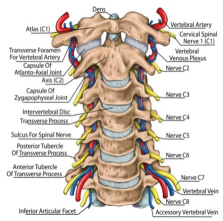
Background



Cervical Spine protects the vasculature and nerves of head and neck; hence injuries here can be catastrophic

In UK, approx. 500-600 people annually have spinal injury. 50% caused by Cervical-spine injuries [1]

Prompt immobilization and effective treatment is essential.

2

Previous Research

- Various studies have shown surgical techniques are helpful in achieving favourable outcomes.
- Fredø (2016) – Neurological long-term results were good, with 51 % improvement in AIS grade and resolution of radiculopathy in 89 % of the patients who were surgically treated.
- Xu & Lun (2023) - Surgically treated patients followed for 17.5 months had better improved Japanese Orthopaedic Association (JOA) score score to 8.17 + 1.39.
- Little to none exploring patient's employment and long-term neurological status.

3

Aim

01

Get insight into patient's long-term outcomes post Cervical Spine Fracture Fixation

02

Explore patient's overall satisfaction

4

Outcomes

- Neurological Status : Any abnormal neurological function
- Post-surgical complications : Any complication caused by the direct effect of the surgery.
- Long Term Employment : Current Occupation
- Patient Reported Outcomes Measured (PROM): overall satisfaction
- Litigation: Any lawsuits involved with their care

5

Methods

All patient who had a cervical spine fracture fixed in UHW between 2013 and 2019 were collected. 5 years of minimum follow up.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• Treated in UHW • Traumatic fracture/s and/or dislocation/s of Cervical spine • Aged 18 and above years at time of injury • Surgical Fixation	• Osteoporotic / insufficiency / stress fractures, infection, neoplastic pathological fractures • Any fractures not involving the cervical spine

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173 patients had Cervical Spine Fixation

52 were excluded
38 – exclusion criteria
14 - information not found

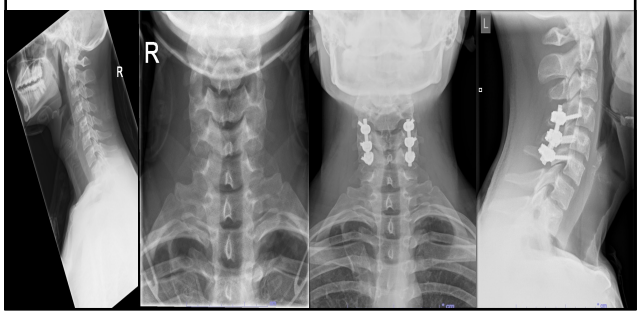
121 were considered

30 patient died

91 Patients

7

Radiological Findings



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Results - Demographics

Characteristic	Total Cohort n=91
Clinical characteristic	
Mean age at injury (SD) (years)	45.93 (22.6)
Sex	
Male Sex [n (%)]	65 (71%)
Female Sex [n (%)]	26 (29%)
Treatment	
ACDF[n (%)]	40 (44%)
PCF [n (%)]	23 (26%)
Corpectomy [n (%)]	10 (11%)
AP [n (%)]	6 (6.6%)
HALO [n (%)]	12 (13.2%)
Mechanism of Injury	
Fall [n (%)]	45 (50%)
RTC [n (%)]	22 (24%)
Sports Accident [n (%)]	9 (11%)
Not Mentioned [n(%)]	15 (16%)

9

Results - Post operative complications

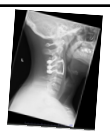
- 29 cases (32%) of post - surgical complications.
- ITU Admission - 8 cases,
- Dysphagia - 9 cases,
- Infection - 5 cases,
- Hoarseness of voice - 5 cases
- infection in halo pins - 2 cases.
- p value was greater than 0.05, this data was not considered significant.

10

Results - Neurological Status

Table 5. Neurological deficits and different surgical operations

Surgical Procedure	Neurological Deficit present x (x%)
ACDF	20 (50.0%)
AP	4 (66.7%)
Corpectomy	3 (30.0%)
HALO	4 (33.3%)
PCF	4 (17.4%)
	35 (38.5%)



- Total of 35 patients have neurological deficits (39%)
- Highest percentage of Neurological Deficits present in AP fixation
- AP fixation => more severe cases
- p value was 0.051, not significant

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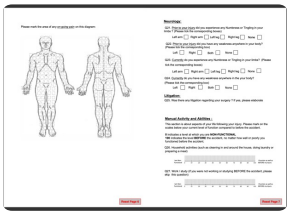

Future Initiative

(i) Questionnaire/ Telephone Call (future initiative) –
- current and prior employment
- surgical/conservative treatment
- any previous and current spinal related pain,
- any spinal neurological deficits,
- AO Spine Patient-Reported Outcome Spine Trauma (PROST) questionnaire, satisfaction
- any ligation related to their care.

Patients given an option to fill it online or via a telephone call.

12

Conclusion

- 25% of patients passed away
- 39% of patients have neurological deficits
- No statistically significance between surgical techniques and outcomes/ complications at last follow up.
- Future – more information on long term employment, litigation and patient satisfaction.

13

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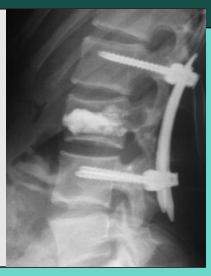
- AO Spine PROST (Patient Reported Outcome Spine Trauma). AO spine Knowledge Forum. 2024.. [accessed 5 Jul 2024] Available from: https://media.aofoundation.org/spine/-/media/project/aocd/aospine/documents/ao_spine_prost_patient_questionaire_form_a4_sept_2020.pdf?rev=c095d8c841fa439ba41b4faa8c1bb91c

14

Open Versus Minimally Invasive Fixation Of Thoracolumbar Fractures

Louis Clayton
Dmitri Shastin
Michael McCarthy
Alwyn Jones
Agbo Pethiyagoda



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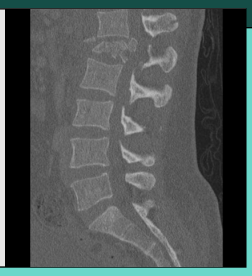
Introduction

- Thoracolumbar fractures
- Open Vs Minimally Invasive Surgery (MIS)



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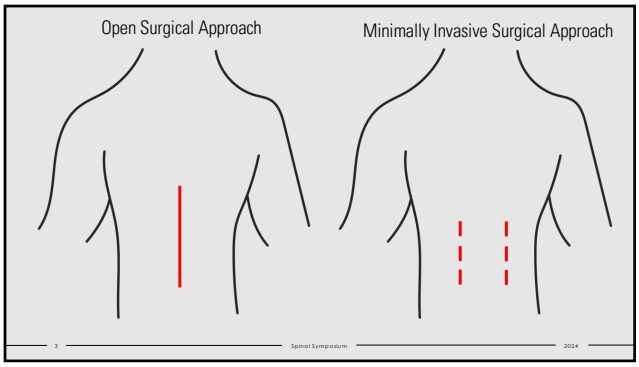

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About the Study

PICO framework:
Patient/**P**roblem
Investigation/**C**omparison
Outcome(s)

Timeframe
This study used cases from a ten-year period between 2014-2024

Where?
University Hospital of Wales

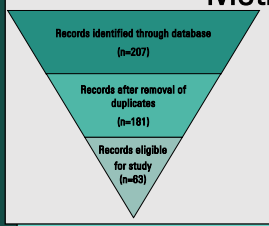
Search Terms
Inclusion and Exclusion Criteria

Outcomes
Clinical and radiological variables were measured

Number of Cases
N = 63 (Open = 47; MIS = 16)

4

Methods



Inclusion Criteria:
- Database search terms: **("Thoracolumbar" OR "Lumbar" OR "Thoracic") AND ("Surgery" OR "Fusion" OR "Stabilisation" OR "Fixation")**
- Primary surgeries
- Disease range T10-L4

Exclusion Criteria:
- Duplicates
- Non-traumatic fractures, e.g. due to malignancy
- Patients with spinal cord injury
- Disease range outside of T10-L4

5

Results

Outcome:	Open Group:	MIS Group:
Patient Age (years)	46	49
Pre-operative kyphosis angle (°)	20.79	16.44
Post-operative kyphosis angle (°)	14.17	11.75
Change in kyphosis angle (°)	6.62	4.69
Metalwork removal rate (%)	12.77	0.00
Surgical time (minutes)	121.51	105.73
Follow-up time (months)	15.19	7.48
Radiation exposure (cGy.cm^2)	134.67	802.54
Complication rate (%)	17.02	0.00

6

Results

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Radiation exposure (cGy.cm^2)	134.67	802.54
Complication rate (%)	17.02	0.00

7

Independent T-test Results

Outcome:	Open Group:	MIS Group:	P-value:	Statistically Significant (p<0.05)?
Change in kyphosis angle (°)	6.62	4.69	0.590	✗
Surgical time (minutes)	121.51	105.73	0.271	✗
Follow-up time (months)	15.19	7.48	0.1031	✗
Radiation exposure (cGy.cm^2)	134.67	802.54	<0.001	✓

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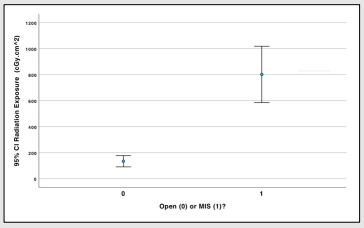
Radiation Exposure



9

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10

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Follow-up time (months)	15.19	7.48
Radiation exposure (cGy.cm^2)	134.67	802.54
Complication rate (%)	17.02	0.00

11

Fisher's Exact Test Results

Outcome:	Open Group:	MIS Group:	P-value:	Statistically Significant (p<0.05)?
Metalwork removal rate (%)	12.77	0.00	0.324	✗
Complication rate (%)	17.02	0.00	0.097	✗

12

Conclusion

Open Surgery	Minimally Invasive Surgery
• Greater change in kyphosis angle (radiological outcomes) • Reduced radiation exposure	• Shorter surgical time • Shorter follow-up time • Lower complications rates • Lower metalwork removal rates

Clinical Vs Statistical Significance?

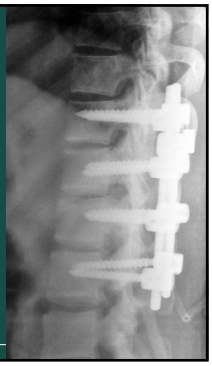
13 Spinal Symposium 2024

13

Thank You!

Any Questions?

Acknowledgements: Dmitri Shastin, Michael McCarthy, Alwyn Jones, Agbo Pethiyagoda



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Leucht, P. et al. (2009) 'Epidemiology of traumatic spine fractures', Injury, 40(2), pp. 166–172. doi:10.1016/j.injury.2008.06.040

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Kocis, J. et al. (2018) 'Percutaneous versus open pedicle screw fixation for treatment of type A thoracolumbar fractures', European Journal of Trauma and Emergency Surgery, 48(1), pp. 147–152. doi:10.1007/s00068-018-0998-4

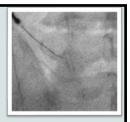
15 Spinal Symposium 2024

15

School of Medicine
Ysgol Meddygaeth

Samantha Todd , Mr Michael McCarthy,
Mr Stuart James

Cardiff University School of Medicine



Comparing the radiation dose for L1-S1 nerve root blocks between surgeons and radiologists in the private sector and NHS.

1

Contributors

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S H James

S Kamath

K Mukherjee

K Lyons

2

Background

- Epidural injections are frequently used for the management of pain secondary to radiculopathy and disc prolapses
- Fluoroscopy machines used for needle guidance – uses ionising radiation
- Rough guidelines for radiation dose exposure levels follow the "ALARA" principles
- Current guidelines from UK Health Security Agency with proposed "NDRLs"
- Outlined that lumbar spine X-ray guided interventions exposure should be no more than 6 $Gy.Cm^2$

3

The aim

- To investigate average radiation exposure between 5 clinicians in both NHS and Private practice
  - *Separated into 2 groups – Spinal Consultants (including their trainees) and Radiologists*
  - *Specific to lumbar epidural injections, L1- S1*
- Null hypothesis : *there is no difference between the Spinal Consultants' (SC) and the Radiologist's (RAD) radiation dose in the NHS and private practice*

4

Methods

- 500 patients' data collected across 5-year period for 5 different clinicians, 3 RADs and 2 SCs
  - *50 patients per clinician per clinical context, NHS or Private Practice (PP)*
- Radiation dose ($Gy.Cm^2$) from NHS radiology department at UHW and CRIS software at Cardiff Hospital
- Inclusion criteria:
  - *all lumbar nerve root block injections / epidurals ONLY*
  - *only L1-S1 levels*
  - *must have MRI report indicating the pathology*

5

Methods continued – Multiple statistical analyses

- SPSS used to compare proposed radiation dose reference levels and collected data for radiation dose – one-way T-test
- Welch's test used to compare radiation dose and screening times between SCs and RADs
- ***One-way ANOVA test used to see if there is a difference between the clinicians between themselves, and what context they were in, on the radiation***
- ANOVA two-way tests used to measure effect of pathology / lumbar level of injection on radiation dose
- All p values less than 0.05 ($p < 0.05$) were considered statistically significant

6

Results

- The average age at examination was 60.2 ± 16.5 years (17 – 97 years) with 247 females (49.4%) and 253 males (50.6%).
- The average radiation dose for both groups in the NHS and PP was 2.66 Gy.Cm² - Welch's one tailed t-test showed that RADs' radiation dose were greater than the SCs' in both contexts ($p < 0.001$)

	N	Minimum	Maximum	Mean	Std. Deviation
Age at examination	500	17	97	60.17	16.511
Screening Time (s)	500	1.00	261.00	52.9485	47.33389
Radiation Dose (Gy.cm2)	500	0.0146	44.00	2.658373	3.6119538

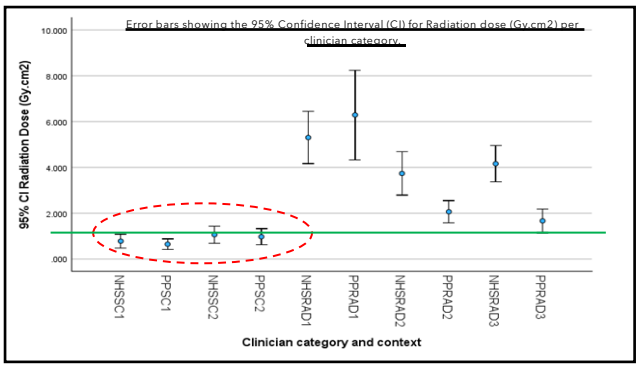
Table 1: Descriptive statistics for 500 patients in both the NHS and PP for both groups

7

Clinician	NHSSC1	PPSC1	NHSSC2	PPSC2	NHSRAD1	PPRAD1	NHSRAD2	PPRAD2	NHSRAD3	PPRAD3
NHSSC1		1.00	1.00	1.00	<0.001	<0.001	<0.001	0.532	<0.001	0.912
PPSC1			1.00	1.00	<0.001	<0.001	<0.001	0.382	<0.001	0.815
NHSSC2				1.00	<0.001	<0.001	<0.001	0.831	<0.001	0.993
PPSC2					<0.001	<0.001	<0.001	0.747	<0.001	0.981
NHSRAD1						0.842	0.240	<0.001	0.692	<0.001
PPRAD1							0.001	<0.001	0.190	<0.001
NHSRAD2								0.164	1.00	0.027
PPRAD2									0.023	1.00
NHSRAD3										0.002
PPRAD3										

- Post hoc tests for one-way ANOVA showed no significant difference between SC's in either context ($p = 1.00$)
- There was significant difference between the majority of RAD's and SC's ($p<0.001$).

8



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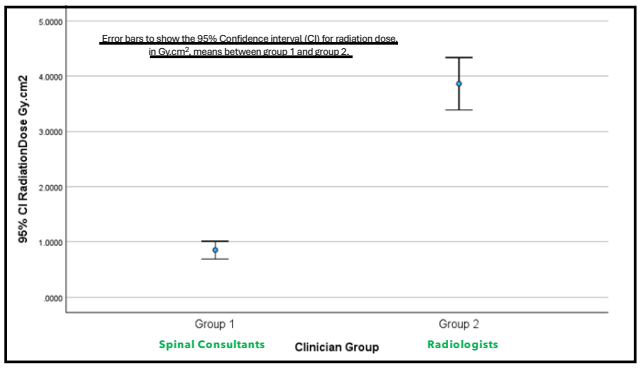

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- Table 1 -> only a significant effect on radiation dose by clinician ($p<0.001$) but not from pathology ($p = 0.974$) or when it was pathology paired with the clinicians ($p = 0.916$).
- No further analysis whether a clinician had more of one pathology, and if this caused an effect on the radiation dose

no effect on the radiation, which could suggest that the differences are caused due to other factors, such as clinician technique and habit.

- The same results were observed between lumbar level and the effect on clinician's radiation dose where there was no significant difference ($p = 0.215$), as seen in table 2.

Source	df	mean square	F	Sig.
Clinician	1	311.293	27.66	<0.001
pathology	27	6.043	0.537	0.974
clinician*pathology	12	5.604	0.498	0.916
total	500			
corrected total	499			

Table 1: *Clinician group and pathology effect on radiation dose using a Two-way ANOVA*
Dependent variable: Radiation Dose Gy.cm2
where $p < 0.05$

Source	df	mean square	F	Sig.
Clinician	1	309.613	28.888	<0.001
Lumbar Level	9	14.329	1.337	0.215
clinician*lumbar level	8	17.216	1.606	0.12
total	500			
corrected total	499			

Table 2: *Clinician group and lumbar level effect on radiation dose using a Two-way ANOV*
Dependent variable: Radiation Dose Gy.cm2
where $p < 0.05$

11

Technique differences

- SCs do not use the machines -> radiographers use machines
  - *don't use continuous exposure – screening time is shorter*
  - *as soon as the injection is made imaging stops*
  - *single image and last image hold used*
- RADs do both the procedure and operate the machines
  - *continuous imaging*
  - *can use contrast + follow through the medicine one injected*
  - *pulse rate of machine could be possible factor*

12

Conclusion

- The results suggested that a radiation dose lower than the proposed NDRL's 6 $Gy.Cm^2$ can be achieved
- Where SCs' average radiation was significantly lower than RADs' radiation, it can be suggested that the use of the single image and last image hold techniques had an impact on lowering the radiation exposure

13

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14

Revision rate and adjacent segment disease following anterior cervical discectomy and fusion compared to cervical disc replacement:

Systematic review and meta-analysis

Medha Raketla, Prof. Keith Morris, Prof. Sashin Ahuja

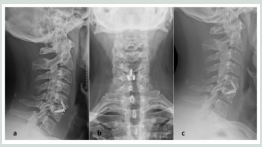
1

Background

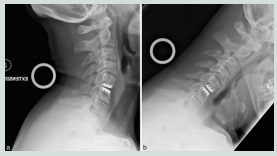
- Patients with cervical myelopathy or radiculopathy are usually treated with non-operative methods
- Patients with failed conservative management may be treated with anterior cervical discectomy and fusion (ACDF) or cervical disc replacement (CDR)

2

Anterior cervical discectomy and fusion



Cervical disc replacement



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Anterior cervical discectomy and fusion

- Widely established procedure
- Broader indications for use

Cervical disc replacement

- Preserves range of neck motion
- Usually suited for younger patients

4

ODEP
Orthopaedic Data Evaluation Panel

- ODEP provides ratings for orthopaedic devices
- Benchmark criteria is required for comparison before providing a rating
- For CDR devices, this criteria focuses on rates of revision surgeries and adjacent segment disease

5

Aim

- To conduct a systematic review and meta-analysis comparing revision rates and adjacent segment disease following anterior cervical discectomy and fusion (ACDF) and cervical disc replacement (CDR)

6

Methodology

- 3 databases were searched from January 2012 through April 2024
- Search terms: cervical disc replacement, arthroplasty, fusion, adjacent segment disease and revision
- Studies were selected based on an eligibility criteria

Publication type	Clinical trial, comparative study, observational study, randomised controlled trial (RCT), retrospective/ prospective reviews, registry based studies
Population	✓ Confirmed diagnosis of CDDD ✓ Minimum 1-year follow-up post-surgery ✗ Younger than 18 years old
Intervention	✓ Single or multi-level CDR ✗ Single or multi-level hybrid constructs
Comparator	✓ Single or multi-level ACDF
Outcomes	✓ Adjacent segment disease ✓ Revision rates

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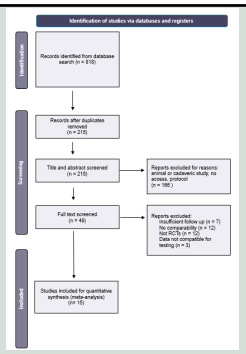


PRISMA

rayyan

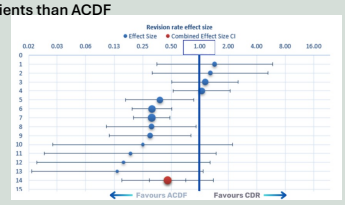
15 Randomised Controlled Trials selected

8

Results

REVISION RATE

- 13 RCTs with 1694 CDR patients and 1417 ACDF patients
- Combined odds ratio = 0.41, 95% CI: 0.25-0.67, p < 0.01
- Rates of revision surgeries are significantly lower in CDR patients than ACDF



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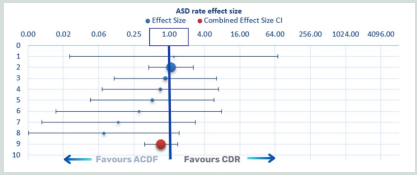
ADJACENT SEGMENT DISEASE

- 8 RCTs with 559 CDR patients and 576 ACDF patients
- Combined odds ratio = 0.73, 95% CI: 0.38-1.39, p = 0.25
- Rates of adjacent segment disease are not significantly lower in CDR patients than ACDF



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Conclusion

Cervical disc replacement appears to be more effective than anterior cervical discectomy and fusion in reducing the need for revision surgeries whereas adjacent segment disease was not statistically significant

11

Discussion


CERVICAL DISC ARTHROPLASTY-CSRS SPECIAL TOPIC ISSUE

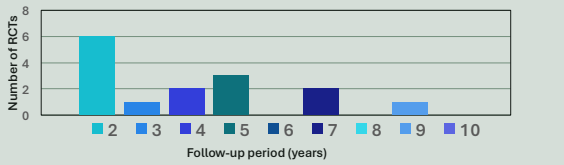
Mid-term and Long-term Outcomes After Total Cervical Disk Arthroplasty Compared With Anterior Cervical Discectomy and Fusion

A Systematic Review and Meta-analysis of Randomized Controlled Trials

Kim, Leo J.Y. MD, PhD; Mazur, Marcus D. MD; Dailey, Andrew T. MD

- This is the latest meta-analysis available in the current literature with similar selection criteria
- Study found significant difference in adjacent segment disease rate between CDR and ACDF
- However
  - fewer RCTs were included
  - higher level of heterogeneity
- Whereas our study was more homogenous and shows more consistent results with a broader data set

12



Short term (2 < years ≤ 4)	Mid-term (4 < years ≤ 7)	Long term (7 < years ≤ 10)
Adjacent segment disease rate:	Adjacent segment disease rate:	Adjacent segment disease rate:
ACDF (24.4%)	ACDF (4.1%)	ACDF (13.2%)
CDR (15.2%%)	CDR (1.5%)	CDR (9.7%)
Revision rate:	Revision rate:	Revision rate:
ACDF (11.0%)	ACDF (19.6%)	ACDF (12.8%)
CDR (4.7%)	CDR (6.3%)	CDR (2.0%)

13

Future directions

- Therefore, there is a need for comprehensive long-term follow-up data
- This data is intended to be used for further stratification and regression analysis to inform ODEP ratings

14

Thank you

15

Epidemiological and Clinical Characteristics of Patients with Spinal Tuberculosis at a Regional Spine Centre In South-West Nigeria

Taofeek Adeyemi,
Adetunji Toluse,
Mustafa Alimi,
Gbolabo Idowu-Deifa,
Babatunde Osundina

Third Annual Cardiff Spinal Surgery Research Symposium **July 12th 2024**

1

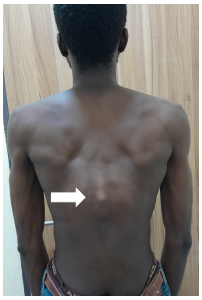
No financial disclosure

2

Introduction

Although Tuberculosis (TB) is one of the world's oldest disease, it is still a major public health issue in developing countries with profound medical, social and economic impact.

Spinal tuberculosis can cause disabling back pain, progressive deformity, and neurological involvement.



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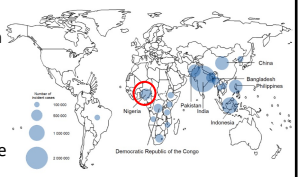
Introduction

Nigeria ranks sixth among high TB burden countries of the world, with an estimated TB incidence of 467 000 cases.

However, there is a lack of large-scale epidemiological studies quantifying the size and severity of the problem of spinal tuberculosis in West Africa.



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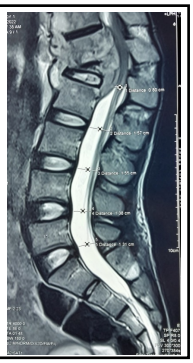
Background

Aim: To gain epidemiological insights from Spinal tuberculosis patients managed at regional Orthopaedic hospital in south-west Nigeria

Objectives:

- To report the demographic characteristics
- To evaluate clinico-radiological presentation, laboratory findings
- To assess the outcomes of treatment



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Methodology

- This study was a retrospective observational study.
- We extracted data from the medical records of all cases of spinal tuberculosis that presented at the hospital between January 2017 and December 2019.
- Epidemiological, clinical characteristics, imaging findings, laboratory test results and treatment methods were recorded.
- Data was gathered, analysed and presented

6

Results

171 cases of spinal TB identified

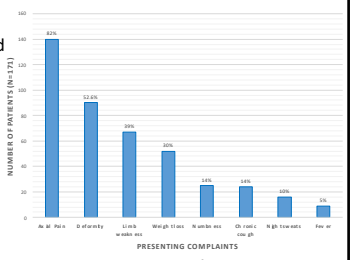
Mean age was 43 ± 15.7 years

Slight male predominance (56.1%)

Axial pain was the main clinical manifestation (82%)

Hx PTB in 14%

51.5% presented with over 6 months Hx of symptoms



Main symptoms and duration of 176 spinal TB patients

7

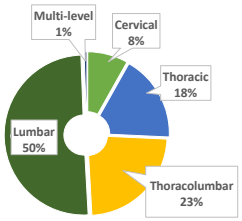
Results

94.2% had plain Xray, followed by MRI (87.1%).

Lumbar spine involved in 50.3%

70.2% having < 3 vertebral involvement.

79% had elevated ESR



Location of vertebral involvement in spinal TB patients (n=171)

8

Results

Varying degrees of neurological impairment were seen in 92 (53.8%) patients and 6% presented with sphincteric dysfunction.

All had combination anti-tuberculosis chemotherapy and a minimum follow up of 12 months.

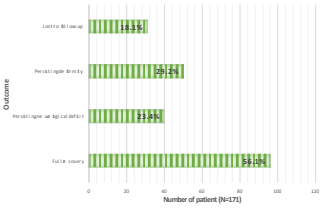
9

Results

Majority of patients (91.2%) were managed non-operatively.

Neurological improvement was seen in 59.8% of those with neurological deficit.

No mortality was recorded



Clinical outcomes of 171 Spinal TB patients

10

Conclusion

- Late presentation and neurological impairment was seen in majority of cases.
- Persistence of neurological impairment is a concern.
- There is a need for strategic intervention to encourage early presentation and appropriate management to reduce morbidity.

11

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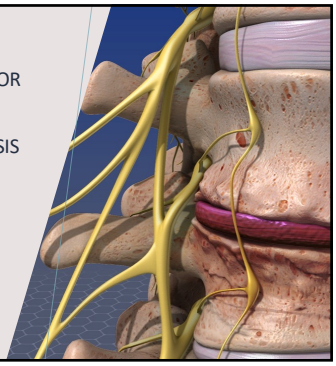
12

EVALUATING OUTCOMES, REVISION RATES, AND NEED FOR METALWORK REMOVAL IN PRIMARY SPINAL INFECTION SURGERIES: A 10-YEAR ANALYSIS

AGBO PETHIYAGODA, TAOFEEK ADEYEMY, MICHAEL MCCARTHY, NIDUK KALUARRACHCHIGE, LOUIS CLAYTON



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CURRENT TREATMENT

- **Presentation**
- Relentless pain and present at rest.
- Muscle spasm may occur causing scoliosis or torticollis.
- Acute fever and pain
- Vague symptoms – chronic illness
- Neurological deficit

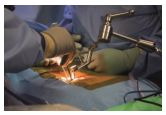
- **Diagnosis**
- History + Examination
- MRI – to confirm location
- Cultures – definitive diagnosis

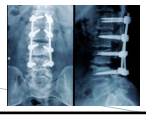
- **Treatment**
- **Non-operative-**
- Organism identified by cultures, aspirate or tissue biopsy
- 6-12 weeks of IV Abx
- Bracing to support the spine to prevent deformity
- Success rates – 75%

2

CURRENT TREATMENT

- **Treatment**
- **Operative – Indications for Surgery**
- Progressive Neurological impairment
- Presence of a spinal abscess
- Severe pain in presence of external immobilisation
- Progressive spinal deformity
- Gross instability
- Failure of non-operative treatment



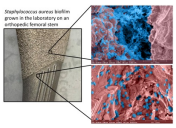


- **Surgery**
- Drain infection and debride all viable tissue
- Stabilise spine
- What happens afterwards?

3

CURRENT LITERATURE ON METALWORK

- Only on metalwork that has already been installed
  - Biofilm – a microbial-derived immobile community characterised by cells embedded in a matrix of extracellular polymeric substances, which they produce.



- Certain bacteria can adhere to surface of implants
- Within a biofilm, bacterial cells become irreversibly attached to the substratum and/or each other.
- Therefore, biofilm protects pathogens against Abx and Immune response
- Biofilm makes identification of causative infectious organism difficult
- Age of biofilm influences susceptibility to Abx

"Although instrumentation can be preserved in early infections (<6 weeks), removal should be considered for infections presenting in a delayed fashion" - is this true?

4

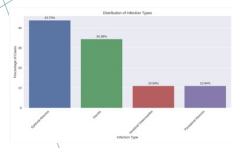
METHODS

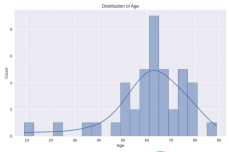
- **Study Design:**
- A retrospective cohort study analysing 53 patients over ten years.
- **Patient Selection:**
- Inclusion criteria: Patients who underwent primary spinal infection surgeries
- **Data Collection:**
- Patient demographics: Age, sex.
- Clinical data: Type and location of infection, comorbidities, duration of infection, surgical details, blood loss, and hospital stay.
- Treatment details: Types of hardware inserted, duration of antibiotics, organisms identified, and their antibiotic sensitivities.

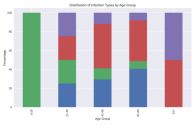
5

RESULTS

THERE WERE NO PATIENTS WITH METALWORK REMOVAL







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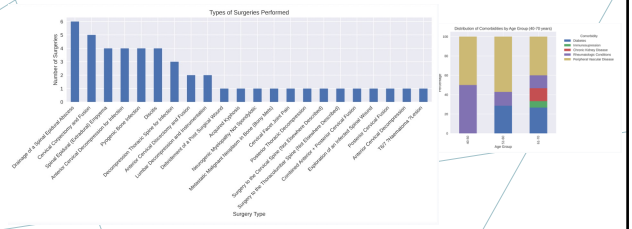
RESULTS

THERE WERE NO PATIENTS WITH METALWORK REMOVAL



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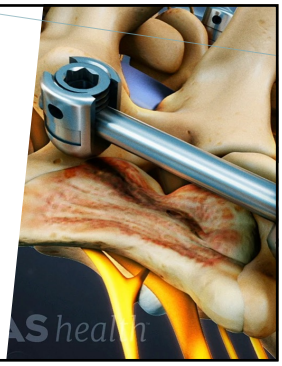
CAN METALWORK BE USED IN PRIMARY INFECTIONS?

- Yes
- None of the 53 patients needed metalwork removal
- None of them needed chronic suppressive Abx treatment
- Metalwork needed for structural support



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9

THANK YOU!

10

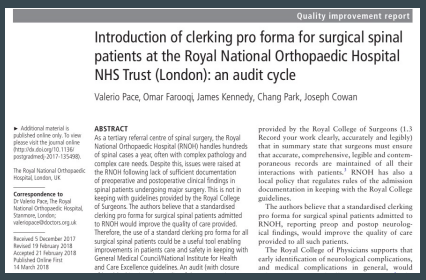
Standardised Admission Proforma In Spine Surgery

Third Annual Cardiff Spinal Surgery Research Symposium
Cardiff

J Stewart, U Jayaraju, S Dehbozorgi & D Shastin

1

Background



Quality improvement report

Introduction of clerking pro forma for surgical spinal patients at the Royal National Orthopaedic Hospital NHS Trust (London): an audit cycle

Valerio Pace, Omar Farooqi, James Kennedy, Chang Park, Joseph Cowan

► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/postgradmedj-2017-135490).

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Received 5 December 2017
Revised 19 February 2018
Accepted 21 February 2018
Published Online First 14 March 2018

ABSTRACT
As a tertiary referral centre of spinal surgery, the Royal National Orthopaedic Hospital (RNOH) handles hundreds of spinal cases a year, often with complex pathology and complex care needs. Despite this, issues were raised at the RNOH following lack of sufficient documentation of preoperative and postoperative clinical findings in spinal patients undergoing major surgery. This is not in keeping with guidelines provided by the Royal College of Surgeons. The authors believe that a standardised clerking pro forma for surgical spinal patients admitted to RNOH would improve the quality of care provided. Therefore, the use of a standard clerking pro forma for all surgical spinal patients could be a useful tool enabling improvements in patients care and safety in keeping with General Medical Council/National Institute for Health and Care Excellence guidelines. An audit (with closure

provided by the Royal College of Surgeons (1.3 Record your work clearly, accurately and legibly) that in summary state that surgeons must ensure that accurate, comprehensive, legible and contemporaneous records are maintained of all their interactions with patients.[1] RNOH has also a local policy that regulates rules of the admission documentation in keeping with the Royal College guidelines.

The authors believe that a standardised clerking pro forma for surgical spinal patients admitted to RNOH, reporting preop and postop neurological findings, would improve the quality of care provided to all such patients.

The Royal College of Physicians supports that early identification of neurological complications, and medical complications in general, would

2

Standardised Admission Proforma - RNOH

- Tertiary referral centre
- Inadequate documentation
- Audit against GMC/NICE guidance (2016)
- Objective: enhance pre & postoperative documentation/improve patient care and safety
- Method: retrospective case note audit

3

RNOH audit - results & discussion

Pre-implementation:

- 46.7% documented neurological exam preoperatively
- 0% postoperative neurological documentation.

Post-implementation: (30% uptake)

- 100% complete neurological exams documented pre & post operatively.

Due to resistance to change → ongoing education → improved compliance

4

Current Practice- UHW Cardiff

Poly-trauma → MTC proforma

ED/transfers/clinic/GP/elective → **hospital continuation sheets**

5

Audit Objective

Standardization of clerking procedure in compliance with GMC and NICE guidelines

6

Method

Retrospective case note audit (June 2024)
Standards: GMC/NICE
Inclusions: all non elective admissions
Outcome variables:

- Neuro exam (abscent/brief/detailed)
- History
- Radiological findings
- Diagnosis
- Intervention/Plan

Intervention: standardised single page check list proforma

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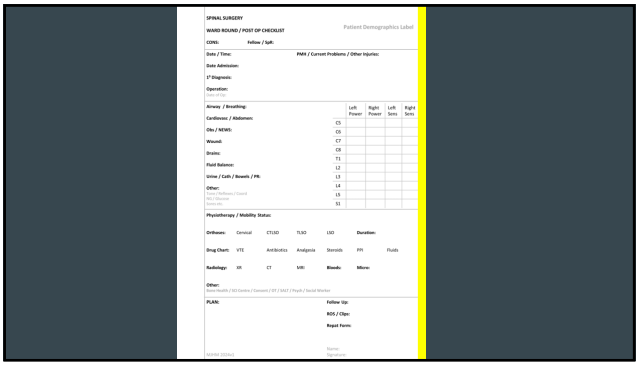

SPINAL SURGERY

WARD ROUND / POST OP CHECKLIST

Patient Demographics Label

CONS: Fellow / SpR:

Date / Time: PMH / Current Problems / Other Injuries:

Date Admission:

1st Diagnosis:

Operation:

Airway / Breathing:

Cardiovasc / Abdomen:

Obs / NEWS:

Wound:

Drains:

Fluid Balance:

Urine / Faith / Bowels / PR:

Other:

	Left Power	Right Power	Left Sens	Right Sens
C5				
C6				
C7				
C8				
T1				
L2				
L3				
L4				
L5				
S1				

Physiotherapy / Mobility Status:

Orthoses: Cervical CTLSO TLSO LSO Duration:

Drug Chart: VTE Antibiotics Analgesia Steroids PPI Fluids

Radiology: XR CT MRI Bloods: Micro:

Other:

PLAN: Follow Up:

ROS / Clips:

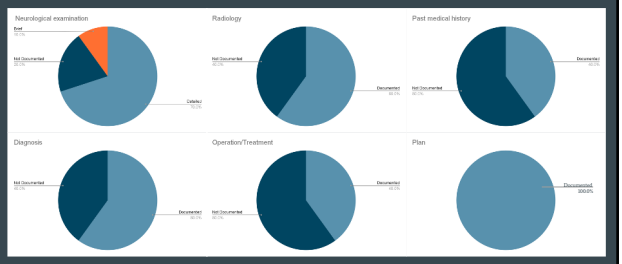
Repat Form:

Name:

Signature:

8

1st Cycle



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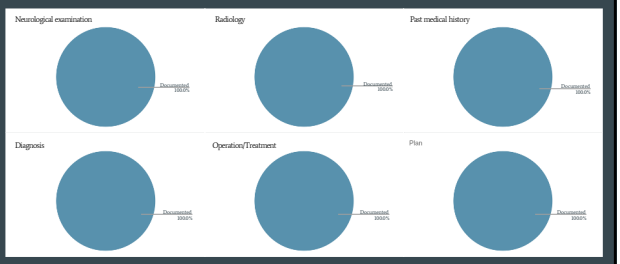
2nd Cycle



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Discussion

Simple intervanetion → quality of documenation → patient care/safety

Audit leads → responsible for clerking patients (audit cycle)

Next step → consolidation proformas/check list → single comprehensive spine surgery clerking proforma

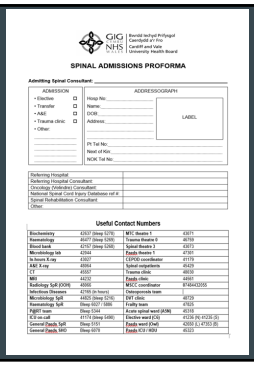
11

Reference

Pace V, et al. Postgrad Med J 2018;94:305–307. doi:10.1136/postgradmedj-2017-135498

12

Comprehensive proforma



SPINAL ADMISSIONS PROFORMA

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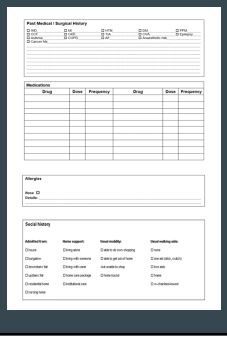

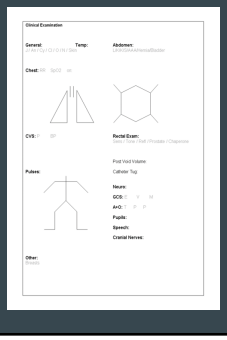

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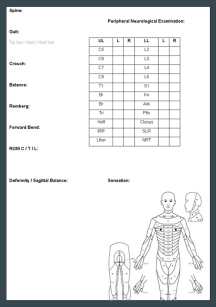

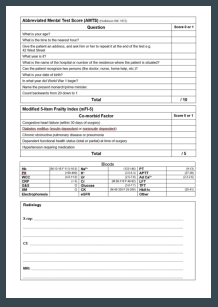

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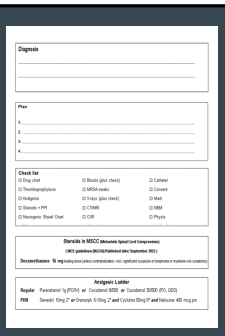

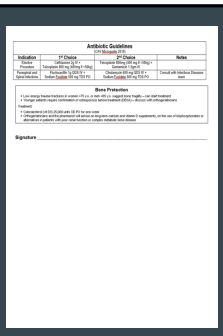

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A RETROSPECTIVE COMPARATIVE STUDY USING THE MODIFIED 5-ITEM FRAILTY INDEX IN PATIENTS AGED BELOW AND ABOVE 65 AS A PREDICTOR OF POST-OPERATIVE COMPLICATIONS IN LUMBAR DEGENERATIVE SPINE SURGERY

Julie Mathew
Professor Sashin Ahuja

1

Introduction

- Frailty increases risk of poor outcomes post surgery
- Assessing frailty can help better understand patient risk and prognosis compared with just age
- Assessing risk, planning care and making informed decisions

2

Frailty Indices

- Various frailty indices are utilised
- In Cardiff and Vale UHB, The clinical frailty score is commonly used
- As per our review of the literature, the Modified five-item frailty index (MFI-5) is commonly used in spine surgery and is shown to be user-friendly and repeatable

3

Background

- MFI-5 has been used in spine surgery
- It has been used for an array of spine surgeries such as : spine trauma, spinal deformities etc.
- MFI-5 has also been used for risk stratification and perioperative care (Willhuber et al. 2023)
- There has only been one other previous paper which looks at MFI-5 and its effect in degenerative spine surgery (Chotai et al. 2022)

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Objectives

- Evaluate the MFI-5 score as a predictor of post-operative adverse events (AE's) in elective lumbar degenerative spinal surgery (i.e one- or two-level decompression +/- stabilisation)

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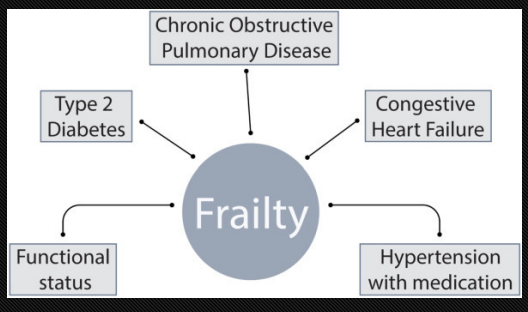

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Methodology

- 65 consecutive patients above age 50
- Elective lumbar degenerative spine surgery (one or two level decompression)
- Group A-50-64 and Group B-65 and above
- MFI-5 score was calculated for both groups
- Evaluate adverse events up to 90 days post-operatively
- Analyse:
  - Correlation between MFI-5 and post-operative events
  - Age as a predictor or AE's

7

Results

	Group A (50-64)	Group B (over 65)	
Number of participants	27	38	
Male	52%	53%	p=1.0
Female	48%	47%	
Mean MFI-5	1.59	1.34	
Post-operative adverse events	37%	81%	p=0.00079
Intra-operative complication	19%	21%	p=1.0

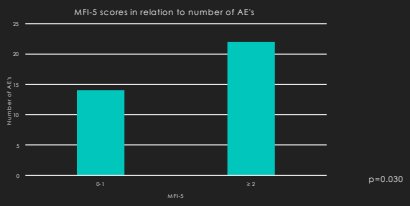
8

Results

Post-operative complication	Group A (50-64)	Group B (over 65)	
Urinary retention	11%	29%	p=0.152
Unresolved symptoms	7%	15%	p=0.550
Gastrointestinal issues	11%	15%	p=0.923
Surgical site infection	7%	2%	p=0.713
Chest infection	11%	2%	p=0.319
Cardiac issues	5%	0%	p=0.610
VTE	7%	2%	p=0.713

9

Results



p=0.030

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Discussion

- Both studies were similar but there were some notable difference (Chotai et al. 2022)
  - Sample age- over 70
  - Both used elective lumbar spine surgery
  - They looked at sarcopenia as an effect as well as frailty
- None of the patients had revision surgery or returned to theatre in 90 days post op in our study group
- Higher MFI-5 scores in relation to AE showed significance in the binary logistic regression (p=0.030)
- Age was also a significant factor for post operative AE (p=0.0007)
- Urinary retention was the most common complication in both groups; early catheterization or awareness

11

Limitations

- A retrospective study
- Small cohort study- time constraints, accessing notes
- Work is still ongoing- include more patients

12

Conclusion

- Significant link between frailty and post-operative AE's
- Patients with an MFI-5 score above 2 had a higher rate of complications
- Age seems to also be predictor of AE's
- Tailored pre-surgical counselling and necessary precautions to enhance recovery and reduce AEs for high-risk patients.

13

Questions

14

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Chotai, S. et al. 2022. Frailty and Sarcopenia: Impact on Outcomes Following Elective Degenerative Lumbar Spine Surgery. *Spine (Phila Pa 1976)* 47(20), pp. 1410-1417. doi: 10.1097/brs.0000000000004384

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Panayi, A. C., Haug, V., Kauke-Navarro, M., Foroutanjazi, S., Diehm, Y. F. and Pomahac, B. 2021. The modified 5-item frailty index is a predictor of perioperative risk in head and neck microvascular reconstruction: An analysis of 3795 cases. *American Journal of Otolaryngology* 42(6), p. 103121. doi: https://doi.org/10.1016/j.amjoto.2021.103121

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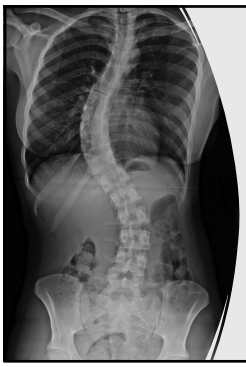


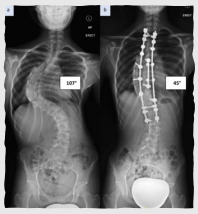
Assessing the unfused distal lumbar segments post-posterior correction and fusion in Adolescent Idiopathic Scoliosis

Christina Ann Sam
Professor Sashin Ahuja

1

Adolescent Idiopathic Scoliosis (AIS)

- Three-dimensional deformity of the spine
- AIS occurs in children over the age of 10 years old
- Conservative management: bracing and physiotherapy
- If conservative measures fail, a posterior correction and fusion is the most common surgical procedure
- The goal is to adequately correct the curve and optimize the number of segments fused with the intention of saving segments but maintaining overall spinal balance



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After selective spinal fusion

- Evidence of spontaneous correction of the unfused spine
- Previous study shown that the remodeling element is partly contributed by the disc morphology
- Our aim is to investigate the morphological changes in the unfused lumbar spine below the fusion of the thoraco-lumbar spine after 2 years

3

Inclusion criteria

- Consecutive adolescent idiopathic scoliosis patients who underwent surgery
- Lenke classification of type 1, 2 or 3
- Spinal fusion at the level of L3 or above
- Patients with PA and lateral X-ray films, preoperatively, early post operative and at 2 year follow up

→ 40 patients

4

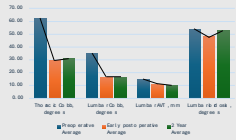
Measurement parameters

5

Results

Local parameters

	Thoracic Cobb (degrees)	Lumbar Cobb (degrees)	Lumbar AVT (mm)	Lumbar lordosis (degrees)	Frontal Balance (mm)	Sagittal Balance (mm)
Preoperative Average	62.37 ± 11.17	34.98 ± 14.25	14.97 ± 18.59	53.83 ± 12.01	3.90 ± 21.08	-5.81 ± 37.82
Early post operative Average	29.92 ± 9.32	17.06 ± 8.93	11.61 ± 13.44	47.84 ± 11.49	11.12 ± 20.13	12.73 ± 30.44
2 Year Average	30.73 ± 9.52	16.98 ± 8.94	10.49 ± 13.01	52.56 ± 12.43	7.73 ± 13.51	-13.10 ± 34.17



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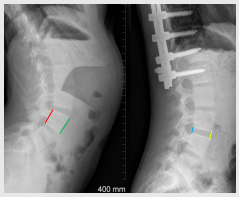
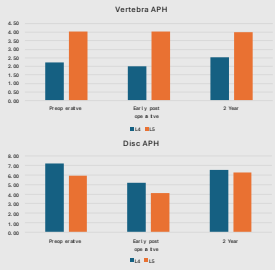
Anterior-Posterior height difference





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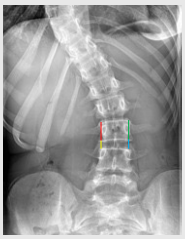
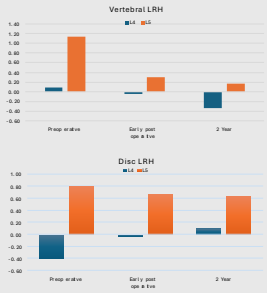
Left-Right height difference





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Discussion

- There is one other paper reporting on the morphological changes of the unfused spine
- Our study had a total of 40 patients whereas theirs have 58 patients
- In our data, the lumbar Cobb angle has been maintained and not deteriorated. This is a similar trend reported in the comparative study
- Lumbar lordosis is seen to decrease in the early post operative films and then increase at the 2 year follow up which also aligns with the other study
- A difference in our study is that we have also looked at the apical vertebral translation which is important for assessing spinal alignment and balance

9

Further work

- Assessing patients at longer interval periods
- Incorporate more patients from the database from 2007-2022
- Perform statistical analysis of the data

10

Limitations

- Time constraints
- Cohort size
- Poor quality of X-rays for some patients hence they were excluded
- Difficulty visualising vertebrae and discs, particularly L5 vertebrae and its disc
- Inconsistency of the X-rays ordered for patients

11

Conclusion

- Changes after fusion in the distal unfused lumbar spine have been observed
- No further progression of the unfused lumbar Cobb angle or worsening angulation of lowest instrumented vertebral disc requiring extension of the fusion following 2 years of the surgery

12

Thank you

Special thanks to Professor Ahuja
for his guidance and support
throughout this project

13

DOES CORRECTIVE SURGERY FOR PAEDIATRIC SPINAL DEFORMITY AFFECT LATER OBSTETRICAL OUTCOMES?

Ronan Mckeogh & Sashin Ahuja

1

PAEDIATRIC SPINAL DEFORMITY

- AIS is the most common type of spine deformity in children [1].
- Its incidence is 8-10x higher in females [2].
- Many young girls and parents are concerned about the potential impact of corrective surgery on later pregnancy and childbirth.
- Data regarding these outcomes are limited.

2

EXISTING RESEARCH

- Multiple studies have found an increase in the rate of C-sections after corrective surgery [3,4,5].
- Two of the studies found that lower-instrumented vertebrae (L3 and below) were associated with a further increased rate of C-section [4,5].

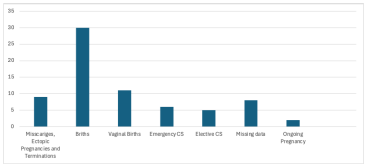
3

METHODS

- 218 consecutive female patients who underwent paediatric spinal surgery for deformity between 2007 and 2017 were included in this study.
- The hospital database (Welsh Clinical portal and CaV Hub) was reviewed to determine these patients' subsequent rates of conception, and outcomes of labour and delivery.
- Only patients whose relevant information was available on the local hospital database were included.
- Many women had moved out of the area.

4

RESULTS



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CONCLUSION

- 50% of women had a successful vaginal delivery compared to a national rate of ≈67%
- There was no correlation found between the mode of delivery (vaginal delivery or CS) and the lowest instrumented vertebrae.

6

FUTURE OF THE PROJECT

- The project has been approved as a service evaluation and a maternity database will be accessed to gather more data.

7

REFERENCES

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- 4. Swany L, Larson AN, Shah SA, Grabala P, Milbrandt T, Yaszemski MJ. Outcomes of pregnancy in operative vs. nonoperative adolescent idiopathic scoliosis patients at mean 30-year follow-up. Spine Deformity. 2020;8(6):1169-74.

8

Comparison of Freehand Screw Placement and 3D Printed Guides in Paediatric Scoliosis Surgery

M J H McCarthy, S James, A Jones, M Muyengwa, E Clifford Spence
University Hospital of Wales, Cardiff

1

Disclosures

- Mr McCarthy – Educational contract Globus
- Mr James – Educational contract Nuvasive
- Mr Jones – Educational contracts Nuvasive, Kuros, Synergy and Paradigm
- Mr Muyengwa – Fellow
- Miss Clifford Spence – Medical Student

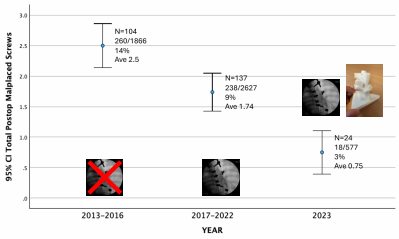
2

The Problems

- Missed screws:
  - Review of 265 paediatric cases 2013-2023
  - 5070 screws – all freehand placement – **no routine II until 2017/8**
  - 516 (10%) deemed malplaced on post op XR
- IONM alerts:
  - Review of 206 paediatric cases 2017-2022
  - 11 (5%) had a significant intraoperative neuromonitoring event
  - 1/3 during screw insertion and 1/3 during curve correction
- 12 claims settled 2003-2020 CVUHB for malplaced screws:
  - average cost - £599,000 each

3

The Problems



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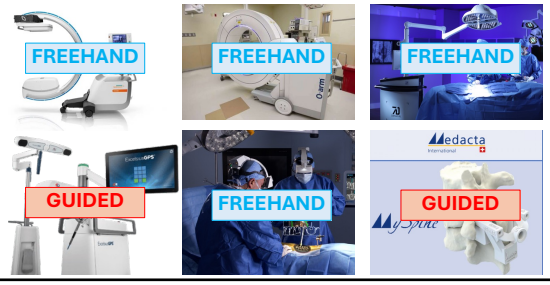
The Solutions



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Cardiff Experience

- December 2022 – Medacta MySpine Guides for all Deformity Cases
- 48 cases (MM AJ SJ)
- 1053 screws
- Compared to the preceding 70 cases – freehand (II check at end)
- 1237 screws
- Technique – dual surgeon - precontoured rods with monoaxial screws in concavity – reduce spine to rod with towers then perform further derotation on mono screws - workflow unchanged by use of guides

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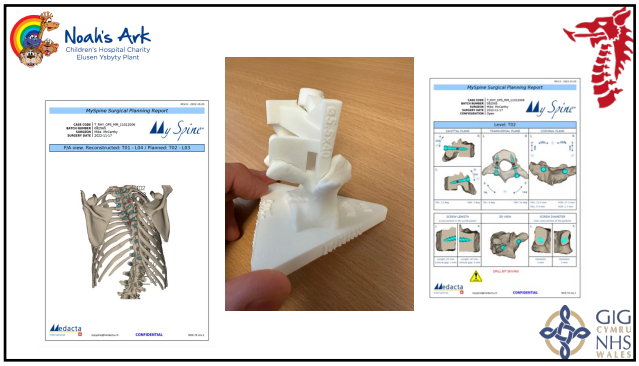

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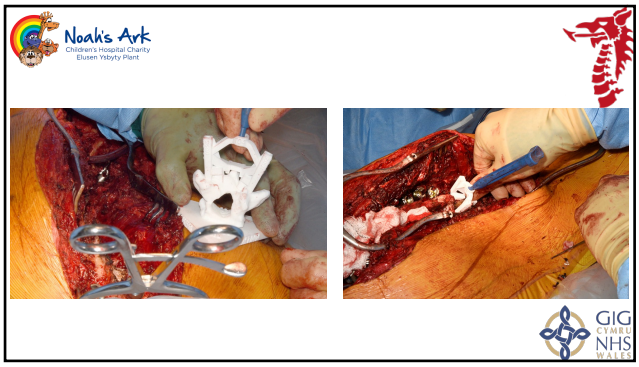

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Freehand vs 3D Printed Guides

	Freehand n=70	3D-printed guides n=48	
Number of screws	1237	1053	p<0.05
Number of levels	13.1	13.7	NS
Patients with screws to pelvis	4%	17%	p<0.05
Screws per patient	17.7	21.9	p<0.001
Intraop malplaced screws per pt	1.5	0.85	p=0.009
Postop malplaced screws per pt	0.5	0.15	p<0.05
% of screws considered malplaced	3%	0.7%	p<0.05
Total postop long screws	15	2	NS

10

Freehand vs 3D Printed Guides

	Freehand n=70	3D-printed guides n=48	
Op time	175 mins	169 mins	NS
Time per screw	10 mins	7.8 mins	p<0.001
Blood loss	778 ml	767 ml	NS
CT radiation dose	54 mGycm^2	550 mGycm^2	p<0.05
II radiation dose	0.09Gycm^2	0.14 Gycm^2	NS
Postop CT	5 patients	2 patients	NS

- Preop Cobb, postop Cobb and change in Cobb were not significantly different between the groups
- Average of 0.73 jig issues reported per patient

11

Freehand vs 3D Printed Guides

- **Conclusion**
  - 3DPG - more screws inserted and longer constructs to pelvis
  - Time per screw insertion was significantly less
  - No change in op time, blood loss or length of stay
  - Number of mal-placed screws was reduced

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Noah's Ark
Children's Hospital Charity
Elusen Ysbyty Plant
Q & A
GIG CYMRU NHS WALES

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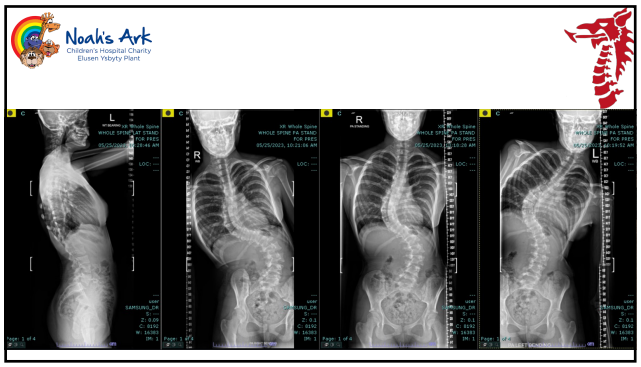
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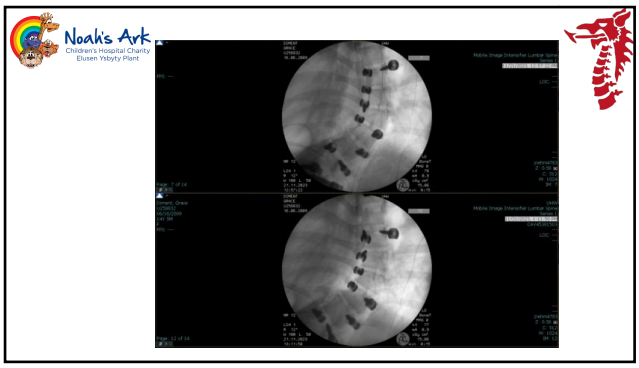
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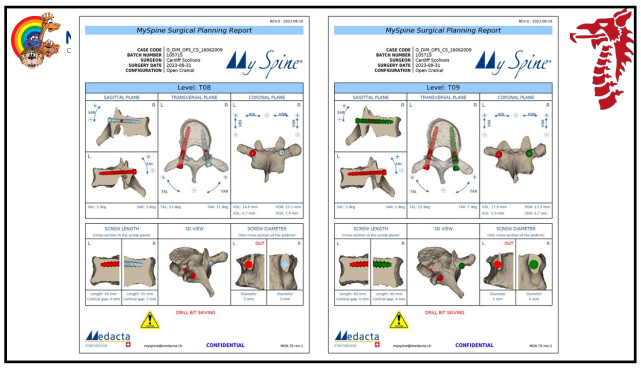
MySpine Surgical Planning Report
Level: T08
Level: T09
CONFIDENTIAL

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