



# Scottish Spine Surgeons

## 11<sup>th</sup> Meeting - Glasgow 2018

<b>Day 1: Friday 9<sup>th</sup> November</b>			
<b>Coffee – Princess Alexandra Room 09:45-10:30</b>			
<b>Session 1 <i>Training spinal surgeons</i> Chair: Mr Fraser Dean Peter Lowe Lecture Theatre</b>			
<b>10:30-12:30</b>	10:30	Welcome	Mr Barrett & Mr Dean
	10:40	Running a joint spinal fellowship- rewards and challenges	Mr Robin Pillay
	11:20	Towards a joint spinal training programme?	Mr Chris Adams / Mr Simon Roberts
	12:00	Open discussion- should spinal surgery be a separate specialty in Scotland?	<i>Scottish spinal surgeons</i>
<b>Lunch – Princess Alexandra Room 12:30-13:30</b>			
<b>Session 2 <i>Spinal Injuries</i> Chair: Mr Chris Barrett Peter Lowe Lecture Theatre</b>			
<b>13:30-15:30</b>	13:30	Burst fractures- who needs surgery anyway?	Mr David Jaffray
	14:10	Surgical management of thoracolumbar injuries	Mr Calan Mathieson
	14:40	Management of the spinal injury patient in a National Unit	Dr Alan McLean
	15:10	Questions and discussion	<i>Scottish spinal surgeons</i>
<b>Coffee – Princess Alexandra Room 15:30-16:00</b>			
<b>Session 3 <i>Complex cases</i> Chair: Mr Nick Brownson Peter Lowe Lecture Theatre</b>			
<b>16:00-17:30</b>	Presentation of complex cases: <i>That's what you should have done!</i>		
<b>Dinner</b>			

<b>19:30 for 20:00</b> <b>Koh-I-Noor, 235 North Street, Glasgow G3 7DL</b>			
<b>Day 2 : Saturday 10<sup>th</sup> November</b>			
<b>Coffee – Princess Alexandra Room</b> <b>08:45-09:30</b>			
<b>Session 4 Tumour</b> <b>Chair: Mr Odhran Murray</b> <b>Peter Lowe Lecture Theatre</b>			
<b>09:30-10:45</b>	09:30	Primary bone tumours - the UK perspective	Mr Mel Grainger
	10:00	Primary bone tumours - the Scottish Experience	Mr Tony Reece
	10:30	Discussion: how should primary bone tumours be managed in Scotland?	<i>Scottish spinal surgeons</i>
<b>Coffee – Princess Alexandra Room</b> <b>10:45-11:00</b>			
<b>Session 5 Free papers</b> <b>Chair: Mr Alex Augustithis</b> <b>Peter Lowe Lecture Theatre</b>			
<b>11:00-13:15</b>	11:00-12:45	Free papers	
	12:45-13:00	Where next?	
	13:00-13:15	Awards and closing remarks	
<b>Lunch and Depart</b> <b>13:15-14:00</b>			

The Scottish Spine Surgeons seek to promote high quality and safe spinal surgery across Scotland. The annual meeting is a forum for learning, discussion and promotion of best practice in a friendly environment. Further information is available via the website [www.spinesurgeons.scot](http://www.spinesurgeons.scot).

**Venue:** The Royal College of Physicians and Surgeons of Glasgow, 232-242 St Vincent St, Glasgow G2 5RJ

**Accommodation:** (Thursday and Friday) will be at the Glasgow Hilton Hotel, 1 William Street, Glasgow G3 8HT

**CPD:** An award of CPD for Friday and Saturday have been applied for from the Royal College of Physicians & Surgeons of Glasgow

Many thanks to our sponsors for funding this meeting:



## Trainee & Medical Student Paper Presentations

(8 minute talk with 4 minutes for questions)

All papers registered;

Funding: None.

Conflicts of Interest: None.

### 11.00 – Paper 1

Title: Surgical Site Infection in Spinal Surgery – What's bugging us?

Authors: **Ferguson D**, Fazliu E, Barrett C

Institution: Department of Neurosurgery, Institute of Neurological Sciences, Glasgow, UK

Introduction: The CDC healthcare-associated infection (HAI) prevalence survey demonstrated a Surgical Site Infection (SSI) rate of 1.9% of inpatient operations<sup>1</sup>. Much of the current focus is to prevent SSI with infection control practices. SSI is associated with a mortality rate of 3% and 75% of SSI-associated deaths are directly attributable to the SSI<sup>2</sup>. We reviewed our spinal neurosurgical practice in a large single center.

Method: Operative records for 23 months inclusive (June 2016-April 2018) were obtained and data on SSI was collected prospectively as per the CDC criteria on patients undergoing spinal neurosurgical procedures.

Results: 1983 spinal operations were performed. Included in this there were 1353(68.2%) non-implant degenerative spinal cases, 202 (10.2%) instrumented spinal procedures, 294 (14.8%) anterior cervical discectomy and fusions, 69 (3.5%) nerve root or epidural injections, 5 (0.25%) SMS bands, 4 (0.2%) vascular spinal cases and 56 (2.8%) tumour cases. 4 (0.2%) patients were taken back to theatre for post-operative haematoma. 56 (2.8%) patients were taken to theatre for wound re-exploration with concerns of infection.

Of the 1983 patients, 29 (1.5%) patients were confirmed to have SSI and of these patients 17 (59%) patients required further surgery. 12 patients were managed non-surgically with antibiotic therapy. 3 of the patients that had wound re-exploration for infection did not have further antibiotics after the wound was toileted. Of the 56 patients that were re-explored with suspicion of either post-operative haematoma or infection only then 17 (30.4%) of these 56 patients were confirmed as SSI. Staphylococcus Aureus was the causative organism in 17 cases (59%) of spinal infection.

Discussion: SSI is a topical subject with much of current focus driven at prevention and development of infection control policies. Within our department our infection rate of 1.5% is under the national rate of 1.9%.

## 11.12 – Paper 2

Title: Early results of anterior vertebral body tethering (AVBT) in the treatment of idiopathic scoliosis (IS)

Authors: **Simon B. Roberts**, Hilary Sharp, Caroline Hanley, Athanasios I. Tsirikos, Enrique Garrido, Christopher Adams

Institution: Scottish National Spine Deformity Centre, Royal Hospital for Sick Children, 9 Sciennes Road, Edinburgh, EH9 1LF, UK

Background context: AVBT is an attractive treatment of IS to preserve spinal motion and achieve gradual deformity correction. Promising early results are reported in the USA.

Aim/Purpose: We report our experience of patients who underwent AVBT at reference institutions.

Study design/Setting: Retrospective review.

Patient Sample: All patients within national service undergoing AVBT.

Outcome Measures: Clinical/radiographic.

Methods: Six female patients with IS underwent AVBT (performed in USA (n=4) or Germany (n=2)). Three patients had thoracic and lumbar, and two had single thoracic AIS; one patient had double thoracic JIS. Mean age at surgery was 12.3 years (range: 10.3-14.2) and Risser grade 0.5 (0-1). Mean postoperative follow-up was 11.7 months (5-18).

Results: Patients underwent tethering of mean 8.7 levels (8-9). Mean preoperative main thoracic scoliosis was 54.8 degrees (48-63; flexibility index: 61%), correcting to mean 33.7 degrees (28-39) at follow-up. Three patients had additional thoracolumbar/lumbar scoliosis of mean 45 degrees (40-52; flexibility index: 69.7%). Mean thoracolumbar/lumbar scoliosis at follow-up was 41.7 degrees (30-55). Mean preoperative thoracic kyphosis was 25.5 degrees, remaining unchanged postoperatively. Mean preoperative lumbar lordosis was 54 degrees (41-68), reducing to mean 49 degrees (40-53). Complications included one major intraoperative haemorrhage, and one patient's tether failed causing recurrent deformity.

Discussion: Early results of AVBT for children with IS have demonstrated severe complications and difficulty in predicting evolution of deformity postoperatively.

Conclusions: Reporting patient outcomes is mandatory to better define age and scoliosis thresholds to instigate treatment, as well as the long-term prognosis of AVBT. Management of complications will fall under the remit of our services even if initial procedures are performed elsewhere.

## 11.24 – Paper 3

Title: The Morbidity of Out of Hours Surgery for Cauda Equina Syndrome

Authors: Mr A Kumar, **Dr M Cearns**, Mr C Barrett

Institution: The Neurosurgery Department, The Institute of Neurological Sciences Glasgow

Background context: There is no literature detailing the morbidity of out of hours surgery in Cauda Equina Syndrome (CES) as conceded by the British Association of Spinal Surgeons.

Aim / Purpose: To define this morbidity to improve decision making with regards to timing of surgery. Secondary aim is to audit the activity of out of hours surgery in our Unit.

Study design / Setting: A retrospective case series analysis.

Patient Sample: All patients undergoing surgery out of hours for CES in a single Neurosurgical Unit in 2017.

Outcome Measures: The incidence of CSF leak, nerve root injury or need to return to theatre within 1 month of operation.

Methods: Electronic interrogation of the OPERA Theatre Management System with subsequent case note and Scottish National PACS System analysis.

Results: 41 patients underwent out of hours surgery for CES over one year. Operations were performed by neurosurgical trainees/clinical fellows alone in 68% of cases (n=28). 39% of patients underwent laminectomy plus microdiscectomy (n=16) with the remaining 61% undergoing microdiscectomy alone (n=25). 68% of operations (n=28) started between 1800-0600 hours. One patient had an operative complication of CSF leak giving a risk of 2.4%. Two patients underwent delayed re-operation at one month; one for disc recurrence at the same level and one for disc disease at an adjacent segment.

Discussion: In our unit, the majority of out of hours surgery for CES is being performed by neurosurgical trainees alone and in the night.

Conclusions: The morbidity of out of hours surgery for CES in our unit is comparative to that of elective microdiscectomy.

## 11.36 – Paper 4

Title: The Glasgow Lumbar Spinal Stenosis Scale as a Predictor of CSF Leak in Lumbar Decompression

Authors: Mr A Kumar, **Dr M Cearns**, Mr C Barrett

Institution: The Neurosurgery Department, The Institute of Neurological Sciences Glasgow

Background context: The Glasgow Lumbar Spinal Stenosis Scale (GLSSS) is a novel quantitative measurement formula for the radiological diagnosis of lumbar canal spinal stenosis.

Aim / Purpose: To validate the GLSSS as a potential predictor of the risk of CSF leak in lumbar decompression.

Study design / Setting: A retrospective case series analysis.

Patient Sample: 12 patients who underwent surgery for lumbar spinal stenosis over a 3 year period under a single neurosurgeon.

Outcome Measures: Iatrogenic CSF leak and degree of lumbar spinal stenosis as calculated with GLSS.

Methods:  $(A-S)/A \times 100 = R$  was used to calculate the relative degree of lumbar canal stenosis. S is the canal cross-sectional area of the most stenosed level, A the average canal cross-sectional area of the two levels adjacent to the level of interest, and R the percentage of lumbar spinal canal stenosis. Measurements are calculated using T2 MRI. Patients were split into equal groups based on occurrence of intra-operative CSF leak.

Results: The mean R value in the CSF leak group was 67% vs 48% in the non-leak group. Two tailed t-test p value = 0.019.

Discussion: In patients who sustained a CSF leak the mean R value was significantly higher than that of non-leak group, however due to the incidence of CSF leak this was a small sample group.

Conclusions: The R value as calculated by the GLSSS may be used as a predictor of CSF leak as a complication of decompressive lumbar surgery. A larger study is required to validate this.

---

## 11.48- Paper 5

Title: Mortality of Combined Fractures of Atlas (C1) and Axis (C2) in Adults

Authors: **Fraser Riddoch**, Anna Leerssen, Rashid Abu-Rajab, Andraay Leung

Institution: NHS Greater Glasgow and Clyde (GGC)

Background context: The mortality of axis (C2) and peg fractures is well documented in the literature. However, combined fractures of the atlas (C1) and axis are seldom reported, leading to relatively unknown outcomes and mortality.

Aim/Purpose: This study compares the mortality of combined fractures of atlas and axis, to isolated fractures of either cervical vertebrae.

Study Design/Patient Sample: All C-spine CTs performed in NHS GGC between 01/01/2013 and 31/12/2015 were reviewed, identifying 138 patients with atlas and/or axis fractures for retrospective electronic-record review.

Methods: Kaplan-Meier tables were used to analyse survivorship between 108 patients with isolated and 30 with combined fractures. Similar analysis adjusted for comorbidities including dementia and previous fragility fractures.

Results: Patients were followed up for  $47.3 \pm 10.3$  months (SD). The mortality at 120 days was 26.7% (8/30) for the combined fractures group and 18.5% (20/108) for the isolated fracture group. Nearly half (8/17) of combined fracture mortalities occurred within 120 days. There was no statistically significant difference in the 120-day and overall mortality between these injury patterns. Furthermore, cognitive impairment and previous fragility fractures bore no significant impact on mortality. Nevertheless, mortality in the combined fracture group with previous fragility fractures did trend to have shorter survivorship.

Discussion: We present the largest retrospective review of combined upper cervical spine fractures pertaining to mortality. While our data shows that the 120-day mortality is higher in the combined fractures group, no long-term statistically significant difference is demonstrated.

Conclusions: Combined fractures of atlas and axis are associated with a high mortality rate, especially within the first three months.

## 12.00 – Paper 6

Title: Virtual Spinal Clinic - The Glasgow Experience

Authors: **Ignatius Liew**, Nicholas Kane, Odhrán Murray

Institution: Department of Spine, Trauma and Orthopaedics, Queen Elizabeth University Hospital, Glasgow

Background context: In the climate of increasing waiting times and referrals within the NHS, virtual clinics offer a modern and dynamic avenue to meet current patient demands.

Aim/ Purpose: The efficacy of virtual vetting was determined and since the introduction of virtual spinal clinic, we aim to establish the clinical outcomes of the Glasgow experience.

Study design/Setting: Observational cohort study.

Patient Sample: 5,956 patients were included in the study period. All patients referred to West of Scotland Orthopaedic Spinal Service were prospectively analysed from October 2016 to July 2018.

Outcome Measure: Primary outcomes include patient outcomes, discharges, MRI scans requested and return clinics.

Methods: Prospective data collection from Bluespier International, Droitwich, UK and TrakCare.

Results: The average referrals since October 2016 increased from 200 to 310 at July 2018 (155%). 2,703 (45%) patients were reviewed in the virtual spinal clinic, of which 67% of patients were managed with direct discharge/triaged to physiotherapy. 55% of patients obtained MRI scans prior to clinical assessment. Virtual clinics were able to accommodate 15 new patients compared to 5 in face to face consultation (300% increase productivity).

Discussion: Virtual spinal clinic provides a dynamic process in evaluating patients with the added value in socioeconomic savings for the NHS and patients. Further evaluation is required with discrete event simulation, patient satisfaction



## 12.12 - Paper 7

Title: Microdiscectomy for paediatric lumbar disc herniation: a case series of 7 patients

Authors: **Ashley Raghu\***, Anthony Wiggins<sup>†</sup>; Pasquale Gallo<sup>‡</sup>; Jothy Kandasamy<sup>‡</sup>

Institution: Nuffield Department of Surgical Sciences, University of Oxford\*; Department of Clinical Neurosciences, Edinburgh<sup>†</sup>; Department of Neurosurgery, Royal Hospital for Sick Children, Edinburgh<sup>‡</sup>

Background: Lumbar disc herniation (LDH) is a rare cause of morbidity in the paediatric population that can result in disruption to education and social functioning.

Aim: The purpose of this study was to describe the clinical features of these LDH cases and evaluate the surgical outcomes.

Study design: Retrospective case-series

Patients: 7 consecutive surgical patients with LDH were reviewed. They were treated in Edinburgh with microdiscectomy between 2014 and 2018, following conservative management.

Outcome measures: Clinical characteristics, time from symptom-onset-to-surgery (STS), complications and follow-up pain were assessed.

Methods: Data were retrieved from medical records.

Results: There was 1 male and 6 female patients, with a mean age of 14.4 years (range: 13-16 years). Mean STS time was 13 months (range: 4-39 months). Radicular pain and positive straight-leg-raising test were present in all cases, and the Achilles reflex compromised in 2. 2 patients had microdiscectomy after unsatisfactory results from other decompressive techniques. Of 8 operated discs, 2 were L5/S1 and 6 were L4/L5, 4 of which had associated L5/S1 herniation. 1 girl later required a second microdiscectomy at an adjacent level. No patient received repeat same-disc surgery following microdiscectomy. There were no complications. All 8 procedures resulted in termination of analgesic therapy, with 7 achieving total resolution of radicular pain.

Discussion: Delaying surgery for conservative treatment is warranted, but for how long is unclear. Subsequent herniation at an adjacent level is an uncommon but significant event that microdiscectomy patients are at risk of. Multi-level disc disease at presentation likely increases that risk.

Conclusion: Microdiscectomy for LDH in adolescents is safe and efficacious.

**Special Presentations** (Trainee presentations will be judged during this time)

12.24

Title: Understanding Cauda Equina Syndrome (UCES) Study

Presenter: Julie Woodfield

Institution: Department of Clinical Neurosciences, Edinburgh

12.32

Title: Spirituality of the Spine

Presenter: Pragnesh Bhatt

Institution: Department of Neurosurgery, Aberdeen Royal Infirmary