

**P.111****Peripheral hypersensitivity to subthreshold stimuli persists after resolution of acute experimental disc-herniation neuropathy**

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**Objective:** While acute disc-herniation radiculopathy frequently resolves without clinical sequelae, some patients experience long-term sensory or motor dysfunction. This study examined chronic sensitivity of the rodent hindpaw after resolution of an acute inflammatory neuropathy. **Methods:** C57BL/6 mice underwent mid-thigh sciatic nerve exposure, with sham animals exposed and experimental animals injured by placement of littermate tail nucleus pulposus (NP). Animals were evaluated for mechanical allodynia (Von Frey), thermal sensitivity (heat withdrawal and acetone latency), and gait stability (RotaRod), until the acute nociceptive phenotype resolved. Thereafter, animals were injected with intraplantar subthreshold capsaicin or vehicle followed by the same testing. At sacrifice, sciatic nerves were assessed for macrophage infiltration by immunohistochemistry, and dorsal root ganglion (DRG) explants were assessed for capsaicin sensitivity using cobalt staining. **Results:** NP-treated animals were allodynic after subthreshold capsaicin delivery compared with sham-operated controls and NP-treated animals delivered vehicle only. Early intraneuronal macrophage infiltration at one week dissipated by this three week timepoint. DRGs derived from NP-treated animals exhibited greater cobalt staining upon capsaicin exposure compared with shams. **Conclusion:** Non-compressive disc herniation creates long-term sensitization in the sciatic nerve distribution. This persists despite resolution of acute intraneuronal macrophage migration, and the demonstrated role of TRPV1 provides insight into the transformation of acute inflammatory pain into chronic neuropathic pain.

**P.112****Obesity and lumbar fusion: increased risk of blood loss**

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**Background:** Several studies have demonstrated that obese patients are at increased risk of perioperative complication during lumbar spine surgery. Herein we quantify the association between blood loss and obesity during lumbar fusion. **Methods:** Outcomes were collected in the setting of a single center randomized control trial conducted among patients undergoing elective lumbar fusion. A univariate analysis of potential risk factors (gender, age, body mass index [BMI], number of levels fused, previous use of anticoagulants, and previous use of non-steroidal anti-inflammatories) for operative blood loss was performed. Logistic regression was conducted to estimate adjusted odds ratios (ORs) and 95% confidence intervals. **Results:** Among 85 patients, the mean estimated blood loss (EBL) was 563 ml, 47.1% were male, and the median number of levels fused was one. Obesity ( $BMI \geq 30\text{kg}/\text{m}^2$ ) was a significant risk (OR 2.46,  $P=0.025$ ) for increased blood loss ( $EBL > 500\text{ ml}$ ). Number of levels fused was similarly associated with EBL ( $P<0.01$ ) while gender confounded the association between obesity and EBL. **Conclusions:** Surgeons should anticipate greater blood loss when performing lumbar

fusion in obese patients. To reduce operative morbidity, consideration should be given to preoperative weight loss whenever possible.

**P.113****Evaluation of fusion in a PEEK cage after anterior cervical discectomy and fusion**

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Anterior Cervical Discectomy and Fusion (ACDF) is the gold standard treatment for cervical spondylosis but there is a lack of consensus in the literature regarding which type of bone graft is superior: autograft or allograft. The purpose of this study is to evaluate fusion after ACDF using a stand-alone intervertebral cage packed with autologous cervical bone shavings acquired during the procedure. Twenty patients that underwent single-level ACDF from 2011 to 2014 using a stand-alone polyetheretherketone (PEEK) cage were recruited. Patients were evaluated for evidence of bone fusion by plain films and CT scan. Fusion was primarily assessed by grading the level of trabecular bridging bone across the bone-graft interface. Odom's criteria were used to assess clinical outcome. All interbody disc spaces achieved successful fusion at follow-up. A total of 80% (16/20) of patients had radiographic evidence of trabecular bone present both within and around the cage. The other 20% exhibited bridging bone within the cage but had evidence of minor radiolucent gaps and lack of bridging bone completely surrounding the cage. Eighty percent of patients reported excellent/good clinical outcomes. ACDF using a PEEK stand-alone cage with autograft bone shavings has a high rate of fusion and avoids potential complications of classic autograft harvesting and decreased allograft fusion rates.

**P.114****Intrathecal morphine in lumbar spine surgery: a novel injection technique**

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**Background:** Intrathecal morphine (ITM) is an efficacious method of providing post-operative analgesia. Despite adoption in many surgical fields, ITM has yet to become a standard of care in lumbar spine surgery. This may in part be attributed to concerns over precipitating a cerebrospinal fluid (CSF) leak following dural puncture. **Methods:** The dural sac is penetrated obliquely at a 30° angle to prevent overlap of dural and arachnoid puncture sites. Oblique injection in instances of limited dural exposure is made possible by introducing a 60° bend to a standard 30-gauge needle. Participating spinal surgeons were provided with brief instructions outlining the injection technique. Adherence and complications were collected prospectively. **Results:** The technique was applied to 98 cases of elective lumbar fusion at our institution. Two cases (2.0%) of non-adherence followed pre-injection dural tear. 96 cases of oblique ITM injection resulted in no attributable instances of post-operative CSF leakage. Two cases (2.1%) of transient, self-limited CSF leakage immediately following ITM injection were observed without associated sequelae or requirement for further intervention. **Conclusions:** Oblique dural puncture is not associated with increased incidence

of post-operative CSF leakage. This safe and reliable method of delivery of ITM should be routinely considered in lumbar spine surgery.

## P.115

### Functional and goniometric outcomes after surgical treatment of odontoid fractures

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**Background:** Surgical approaches to stabilize Type-II odontoid fractures include posterior atlantoaxial fixation (PAF) and anterior screw fixation (ASF). While ASF may theoretically allow for greater preservation of neck motion compared to PAF, there is a lack of evidence that one method preserves rotation and function better than the other. **Methods:** Single-centre study involving patients under 75 years old who underwent surgery for Type-II odontoid fracture. Following chart review, degree of neck rotation was assessed in patients using goniometric measurements. Participants completed questionnaires to investigate their perception of neck function and overall health (Neck Disability Index, Short Form-12, and EuroQol 5-D). **Results:** Patient recruitment is ongoing. To date, eleven patients have been reviewed (7 PAF, 4 ASF). Mean patient age was 61+/-12 years in the PAF group and 52+/-16 years in the ASF group. Measured neck rotation was lower in the PAF group compared to the ASF group (mean 58 vs. 110.5 degrees). However, the PAF group also reported fewer functional complaints. **Conclusions:** Preliminary data suggest that patients who receive ASF tend to be younger. While range of neck rotation is superior in ASF patients, their perception of functional ability does not correlate, suggesting that perceived neck function is multifactorial.

## P.117

### Epidemiology of spinal infections: retrospective review of the patients with osteomyelitis, discitis, and epidural abscesses

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**Background:** Spinal infections are one of the most difficult, complex, and multi-disciplinary health conditions. The purpose of this paper was to gather demographic information of the patients with spinal infections and to identify factors that would influence their management. **Methods:** Retrospective chart review of 146 adult patients with osteomyelitis, discitis or epidural abscesses admitted to the Royal University Hospital, Saskatchewan, from 2007-2014. **Results:** Patient demographics included 59% male, 41% female, mean age 53 years. 36% of patients required surgery, 44% were IV drug users, and 71% were managed by surgeons. Presence of a neurological deficit, higher white blood cell count, and longer hospital admission, in relation to poor outcomes, were statistically significant. Higher age and shorter duration between onset of symptoms and admission showed a trend toward a poorer outcome. Epidural abscess and presence of a neurological deficit are variables isolated as being statistically significant in relation to need for surgery. 57.1% of patients with epidural abscess and 51.7% with neurological deficit required surgery. **Conclusions:** We were able to identify high-risk patients as to the need for surgery and poor outcome. Based on this information, we can better tailor our management strategy of this difficult condition.

## P.118

### Free calcium induces degenerative changes in the intervertebral disc through the calcium sensing receptor

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**Introduction:** Degenerative disc disease (DDD) is a common cause of lower back pain. Calcification of the intervertebral disc (IVD) has been correlated with DDD. The role of IVD calcification in the development DDD is unknown. We noticed an increase in ionic calcium content and expression of the extracellular calcium-sensing receptor (CaSR) in the degenerate discs, however, its role in DDD remains unclear. **Material and Methods:** IVD Cells: Bovine and human NP and AF cells were incubated in culture media supplemented with various concentrations of calcium, and a CaSR agonist IVD Cultures: IVDs from bovine tails were isolated and the vertebral bone was removed. IVDs were cultured for 6 weeks in culture medium supplemented with calcium (1.0, 2.5, or 5.0 mM), or a CaSR agonist. Western blotting was performed on extracts to assess for aggrecan and Col II. **Results:** The expression of aggrecan and Col II decreased dose-dependently in both NP and AF cells, as well as in the organ culture model following supplementation with calcium or the CaSR agonist. **Conclusion:** Our results suggest that changes in the local concentrations of calcium are not benign, and that activation of the CaSR may be a contributing factor in IVD degeneration.

## P.119

### Os Odontoideum: an unusual association of compressive synovial cyst. Case report and review of the literature

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**Background:** Os odontoideum is a rare cervical abnormality that harbours a potential risk for atlantoaxial instability. In rare circumstances, synovial cysts may develop and compromise the spinal cord. Therefore, cyst excision has been suggested as part of the surgical management. However, in recent reports, it has been shown that atlantoaxial stabilization alone is sufficient for synovial cyst regression. **Methodology:** 48-year-old woman presented with symptoms and signs of cervical myelopathy secondary to os odontoideum with atlantoaxial instability. A large synovial cyst was diagnosed with significant spinal cord compression. In addition, her spinal and cranial imaging was suggestive of multiple sclerosis which was confirmed clinically thereafter with one episode of MS flare up and positive cerebrospinal fluid analysis. **Results:** After she had recovered from her MS flare up, posterior atlantoaxial instrumentation and fusion was performed without synovial cyst resection. Postoperatively, her clinical condition improved substantially and complete regression of the synovial cyst was noted on cervical MRI. Interestingly, she has not had any MS recurrent episodes after the surgery. **Conclusion:** Degenerative changes in os odontoideum are consequences of atlantoaxial instability. Compressive synovial cysts may develop with associated cord compression. We recommend posterior atlantoaxial stabilization alone in such conditions while preserving cyst fenestration or excision for persistent symptoms related to unresolved synovial cysts.