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Glomus Tumor Presenting as Thoracic Pain: A Case Report.

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Disclosures: U. Eneanya, None.

Patients or Programs: A 63-year-old man with chronic right thoracic pain

Program Description: A 63-year-old man presented with a 20 year history of focal pain to the right T8 intercostal margin. The painful area was approximately 1 inch in diameter, and was described as a severe, burning sensation that was reproducible with percussion. The pain had become more regular in frequency over the past 5 years. The patient received injections of local anesthetic to the area of tenderness with temporary relief.

Setting: Outpatient spine practice.

Results: He was lost to follow-up and returned to the office 2 years later with similar complaints. He underwent a CT scan of the thorax that revealed a 6-mm soft tissue nodule within the subcutaneous fat. The patient underwent surgical excision of this area. Pathology was consistent with a glomus tumor. After the procedure, the patient was pain free and able to return to his normal activities.

Discussion: Glomus tumors are rare vascular hamartomas. They are most commonly benign, but are frequently associated with pain. Presentation is normally with a classic triad of symptoms: hypersensitivity to cold, paroxysmal pain, and pinpoint pain. Though most commonly located in the subungual region of the finger, the location of these tumors can vary widely. The location of the tumor in the above patient was very unusual, and has rarely been reported. Surgical removal of the glomus tumor is effective and curative.

Conclusions: Though rare in overall incidence, glomus tumors should be included in the differential diagnosis of chronic, focal pain of unknown origin.

Keywords: Rehabilitation, Pain, Neoplasm.

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Inadvertant Intradiskal Contrast Flow During Lumbar Transforaminal Epidural Steroid Injections: A Case Series Examining the Occurrence of Intradiskal Injection as well as Potential Risk Factors and Adverse Events.

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Disclosures: E. K. Casey, None.

Objective: Our primary goal was to evaluate the occurrence of inadvertent intradiskal injection during fluoroscopically guided, contrast-enhanced lumbar transforaminal epidural steroid injections (TFESIs). Our secondary aim was to determine if there are any risk factors for or adverse events

associated with inadvertent intradiskal injection during TFESIs.

Design: Retrospective case series.

Setting: Two multidisciplinary spine care centers

Participants: A database of all lumbar TFESIs was searched and 14 cases of inadvertent intradiskal flow were identified between from July 2000-May 2008. The same database was used to find a control for each case that was identical in age, gender, level and side of injection.

Interventions: Not applicable.

Main Outcome Measures: Comparison of the 14 cases and the controls regarding the following variables: radiographic findings at the level of the injection, history of spine surgery, occurrence of diskitis and whether or not a trainee was involved in the procedure.

Results: The incidence of inadvertent intradiskal injection during lumbar TFESIs was 0.2% (14 cases out of a total of 6894 injections). 64.3% of the patients with intradiskal flow had ipsilateral foraminal stenosis at the level of the injection compared with only 28.6% of the controls. All of the patients received either intravenous or parenteral antibiotics for prophylaxis, and there were no infectious or other complications identified.

Conclusions: Intervertebral disk injection is an uncommonly reported event of lumbar TFESIs. Our case series suggests that there might be a higher risk of inadvertent intradiskal flow in patients with intervertebral foraminal stenosis. We did not identify any other risk factors, nor did we find any adverse events associated with intradiskal injection.

Keywords: Complications, Magnetic resonance imaging, Diskitis, Transforaminal epidural steroid injection.

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Inadvertent Cervical Radicular Artery Injection Using a Pencil-Point (Whitacre) Needle: A Case Report.

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Disclosures: D. Leung, None.

Patients or Programs: A 30-year-old man with right cervical radiculopathy.

Program Description: He presented with complaints of right arm and scapular pain with numbness into the right lateral hand and digits. MRI of the cervical spine showed C6-7 disk degeneration, herniation and right neuroforaminal compromise. He had failed multiple conservative treatments. He was scheduled for a right C6-7 transforaminal epidural injection. A 25 gauge 3.5 inch Whitacre needle was guided into the most posterior portion of the mid-foramen. Approximately 0.5cc contrast was injected under real-time fluoroscopy to observe the dynamic flow of contrast. Simultaneous epidural and radicular artery spread was observed. Another image taken seconds after this injection showed the rapid disappearance of the radicular artery contrast pattern.

Setting: University-based spine clinic.

Results: The patient suffered no complications from the procedure.

Discussion: Reports of serious complications related to inadvertent intra-arterial injection during cervical transforaminal epidurals have piqued interest in methods to reduce or eliminate this risk. The incidence of inadvertent vascular penetration during cervical transforaminals is between 19-26% using sharp-beveled needles. Because sharp-beveled needles have the ability to cut thru tissues, some have recommended use of blunt tip and pencil point needles to reduce the odds of vascular penetration. To our knowledge, this case is the first documented instance of inadvertent cervical radicular artery injection using a pencil point (Whitacre) needle.

Conclusions: This case demonstrates that use of pencil-point (Whitacre) needles does not eliminate the risk of inadvertent arterial injection during cervical transforaminal epidurals. Further investigation is required to determine if the incidence of inadvertent vascular injection is reduced with pencil-point needles relative to sharp-beveled needles.

Keywords: Rehabilitation, Epidural, Injection, Cervical.

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Increased Functional Connectivity between Pain-Affect and Body-Perception Brain Regions in Fibromyalgia.

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Disclosures: M. C. Hsu, None.

Objective: To determine regions with significant resting-state functional connectivity to a well-known pain-affect region (anterior insular cortex, AIns) in fibromyalgia (FM) patients compared to healthy controls, using functional connectivity MRI (fcMRI).

Design: Cross-sectional design embedded within a clinical trial.

Setting: Research laboratory within an academic institution.

Participants: 29 FM patients (ages 23-59) and 17 healthy controls (HC; ages 22-57), all right-handed women.

Interventions: Subjects were scanned in a 3T MRI scanner (GE Signa LX). Each subject was instructed to lie quietly for 6 minutes while viewing a fixation cross, during which 144 whole-brain images were acquired.

Main Outcome Measures: Functional connectivity to the AIns, determined as follows: Images were normalized to a standard template, smoothed with a 5mm kernel, and filtered to allow only the 0 - 0.08 Hz band. BOLD signal time-series were extracted from left and right AIns seed regions and correlated with time-series from all voxels of the brain. The resulting voxel-wise *r* maps were transformed to *Z*-maps, which were entered into one- and two-sample *T*-tests (height threshold $P < .0025$, corrected cluster threshold $P < .05$).

Results: For both FM patients and HC, one-sample *t*-tests revealed significant connectivity between bilateral AIns, and

between each AIns and bilateral inferior parietal lobules (IPL) ($P < .01$ corrected, for all regions). Two-sample *t*-tests revealed significantly greater functional connectivity in FM patients between right AIns and left IPL (peak coordinates $\{-60, -33, 36\}$, 38 voxels, $P = .048$ corrected), compared to HC.

Conclusions: This is the first study to compare functional connectivity to the insular cortex between FM and HC. Given the role of the IPL in self-awareness and own-body perception, the increased connectivity seen in FM between AIns and IPL is consistent with enhanced negative affect in association with body self-awareness. This altered sensory-affective relationship may play a role in the perpetuation of chronic pain in FM, and may serve as a future target for brain-based biofeedback in the rehabilitation of FM. Further studies are needed to explore the relationship between altered AIns connectivity and dysfunctional pain processing in FM.

Keywords: Fibromyalgia, fMRI, Functional connectivity, Insular cortex.

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Influence of Ethnicity and Gender on Lumbar Epidural Steroid Injection Outcomes.

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Disclosures: G. Cyril, None.

Objective: To explore the association between ethnicity, gender and back pain treatment outcomes as measured by the 21-item Hospital Anxiety and Depression Scale (HADS) and Visual Analog Scale (VAS) for pain.

Design: Retrospective study of secondary data.

Setting: Outpatient comprehensive spine center.

Participants: 45 patients who underwent epidural steroid injections for back pain between September 2001 and October 2008.

Interventions: Epidural steroid injections.

Main Outcome Measures: HADS and VAS scores pre-injection and post-injection.

Results: 55.6% of patients were female and 44.4% were male. 51% of the patients were ethnic minorities (non-Caucasian). The mean age was 55.5 years old. 60% scored in the abnormal range for mood disorder as measured by HADS pre-injection. This went down to 53.3% post-injection which was not statistically significant. 60% scored in the moderate to severe category of pain (VAS greater than 5) pre-injection compared to 40% post-injection, which was statistically significant. There was no difference across gender and ethnicity for either scales. However, there was a trend of more females reporting moderate to severe pain during both pre (72.0 vs. 50.0%) and post (60.0 vs. 50.0%) assessment. There was also a trend of more minority patients reporting moderate to severe pain during both pre (69.0 vs. 52.7%) and post (62.0 vs. 32.4%) assessment and a trend towards Caucasian pa-