

**Abstract: 407**

**Effects of Local Anesthetic and Nonionic Contrast Agents on Bovine Intervertebral Disc Cells Cultured in Alginate**

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**Introduction:** Carragee et al. have reported accelerated progression of lumbar intervertebral disc (IVD) degeneration after discography at 10-year follow up. Our working hypothesis is that local anesthetic (Lidocaine, Bupivacaine) or contrast (Iopamidol) agents injected into the disc space during discography result in cytotoxicity.

**Purpose:** The purpose of this study is to compare the cytotoxic effects of contrast and two anesthetic agents used in discography, side by side using 3-D cultured nucleus pulposus (NP) and annulus fibrosus (AF) cells. Studies on the effects of these agents on IVD cells will help guide their usage in future clinical practices.

**Methods:** Bovine NP and AF cells were isolated and encapsulated in alginate and cultured in media completed with serum and ascorbic acid. After 6 days of culture, the beads were transferred to a 24-well plate and incubated with Saline (0.9%), Lidocaine (1%), Bupivacaine (0.5%) and Iopamidol (61%) diluted with complete media at three different dilutions (1:2, 1:4, and 1:8) for 2-16 hours. Cells were then stained with the Live/dead cell assay (Invitrogen). Live cells (stained green) and dead cells (stained red) were counted under fluorescent microscopy.

**Results:** There was significant cell death when NP and AF cells were incubated with Lidocaine and Bupivacaine diluted at 1:2 or 1:4. However when diluted by 1:8, these anesthetics did not cause significant cell death when compared to the saline control. Various dilutions of Iopamidol were less toxic compared with the anesthetics.

**Conclusions:** Cell death of 3-D cultured NP and AF occurred when incubated with the two commonly used local anesthetic agents diluted at 1:2 or 1:4. Less cell death occurred when incubated with these anesthetics diluted at 1:8 or with different dilutions of Iopamidol in this short-term culture system. Future studies of the effects of these agents in animal models are indicated in order to more closely predict what happens in patients.