QS34

Prospective Isolation of a Functional Human Cartilage Progenitor Capable of Forming Hyaline Cartilage In Vivo

Lauren Koepke, BS
Cellular/Molecular Biology. Stanford University, San Jose, CA, USA

PURPOSE: Over the past century, the average life span has increased by nearly 30%, leading to an overall aging population and an increase in degenerative diseases, including osteoarthritis. Due to a lack of vasculature and low cellularity in articular cartilage, regeneration does not occur. Since we have identified three human chondroprogenitor (CP) populations, we have the ability to functionally characterize these CPs to identify if these populations give rise to unique types of cartilage.

METHODS: Prospective FACS analysis was performed on digested fresh human bone specimens. The gating strategy was verified in vivo and in vitro. The isolated cell gene expression profile of each population was performed using q-PCR and microarray. In vitro differentiation was performed and analyzed via FACS. Cellular proliferation using CFU in vitro and EdU both in vitro and in vivo was performed. In vivo differentiation was performed using our previously published renal capsule model as well as our xenograft model. The in vivo samples were then FACS sorted for analysis and corresponding IHC (col2, col10, mmp13) and histology (safranin-o fast green and pentachrome) was performed.

RESULTS: Three distinct populations were successfully isolated. Each cell population had a unique gene expression profile signifying a possible variance in differentiation capability. In vitro as well as in vivo differentiation varied between each population CP1-3. The relative proliferation variability also suggests inherent population differences.

CONCLUSION: The potential to isolate a particular CP population that is most proliferative and has the capacity to give rise to articular cartilage is exciting and may provide a new therapeutic strategy for treating patients with osteoarthritis. FACS gating strategy for our three human chondroprogenitor populations, CP1-3.

L. Koepke: None.

QS35

Use Of Nicotine Replacement Therapy In Active Smokers Is Associated With Increased Complication Rate In Breast Surgery

Zhenzhen Xu, BA, Sifron Ndon, BA, Rance JT Fujiwara, BS, Lisa Fucito, PhD, Steven Bernstein, PhD, Henry C. Hsia, MD
Yale School of Medicine, New Haven, CT, USA

PURPOSE: This study aims to determine the effect of nicotine replacement therapy (NRT) on surgical outcomes such as rates of complications in patients undergoing breast surgery.

METHODS: A retrospective chart review of female smokers undergoing breast surgery between January 2014 and April 2017 within the Yale New Haven Health System spanning across four hospitals was performed. Active smoking was defined as cigarette use within one month before or after surgery. Statistical analyses were performed using Stata software.

RESULTS: 254 patients were identified, 34 of whom had documented NRT use six months within their breast surgery. For patient demographics, 52.9% of those with NRT use developed complications—such as infections, wound dehiscence, seromas, hematomas, tissue necrosis, fat necrosis, and lymphedema—compared to 30.5% of their non-NRT counterparts. Multivariate logistic regression accounting for covariates including age, race, BMI, Charlson comorbidity index, insurance type, race, and presence of multiple procedures resulted in a statistically increased risk of complication development in smokers with NRT use [OR 2.42 (1.10–5.33), p=0.027].

CONCLUSION: In our experience, concurrent NRT use in active smokers undergoing breast surgery was associated with an increased risk of postoperative complications.
compared to those not using NRT. We advise caution regarding prescribing NRT to active smokers in preparation for surgery, and recommend prospective studies to better elucidate the relationship between NRT use and postoperative outcomes.

Z. Xu: None. R.J. Fujiwara: None. L. Fucito: None. S. Bernstein: None. H.C. Hsia: None.

**QS36**

**Quantitative Orthopaedic Spine Benefits Post Breast Reduction - Preliminary Results**

**Constantine Papanastasiou, MD, Jean Ouellet, MD, FRCSC, Maryse Fortin, PhD, Lucie Lessard, MD, FRCSC, FRCSC, FACS**

*McGill University, Montreal, QC, Canada*

**PURPOSE:** Breast hypertrophy comes with an array of signs and symptoms that range from mild to debilitating in nature including: headache, neck pain, back pain, breast pain, painful bra strap grooves, hand numbness, and shortness of breath. Breast reduction surgery is one of the most frequently performed plastic surgery procedures that has been shown to have the highest patient satisfaction and improvement in quality of life on specific satisfaction survey questionnaires. The effects of breast reduction surgery on parameters such as sagittal spinal balance, paraspinal muscle function, and physical performance have not been evaluated. The objective of this study is to evaluate the effects of reduction mammaplasty on sagittal spinal balance, paraspinal muscles, and physical function using sophisticated spine surgery imaging modality pre and post breast reduction.

**METHODS:** This is a prospective, observational cohort study being carried out at the Montreal General Hospital (MGH) of the McGill University Health Centre (MUHC). Twenty-five patients are being prospectively enrolled in this IRB approved study. The following methods are used pre-operatively and post-operatively for each patient: EOS X-ray (ultra-low dose radiation) of the spine in standing position*, MRI of the spine, clinical evaluation, patient self-assessment outcomes including Breast-Q (validated questionnaire in French & English). *EOS: A Nobel Prize winning imaging technology done in the standing position and which exposes the patient to 1/10 the radiation of a traditional X-Ray of the spine. EOS is the proper name for the imaging technology and it is not an acronym.

**RESULTS:** Postoperative improvement in thoracic kyphosis and lumbar lordosis are documented quantitatively on patients scanned in the standing position. Preoperative and postoperative MRI of the spine demonstrate quantitative changes in cross-sectional area and functional cross-sectional area. Significant postoperative improvement in all Breast-Q categories documented. The measurements will be presented as well as the radiographic evidence.

**CONCLUSION:** Reduction mammaplasty is not merely an aesthetic procedure but also a procedure with quantitative spine benefits. This may have an impact on health care system and third party payer insurance companies and may beckon the need for better guidelines based on those quantitative findings. This study is also being extended to breast cancer patients with unilateral mastectomy and back pain.

C. Papanastasiou: None. J. Ouellet: None. M. Fortin: None. L. Lessard: None.

**QS37**

**The Efficacy of Closed Incision Negative Pressure Therapy in Complex Abdominal Reconstruction in High-Risk Patients**

**Bao Ngoc Tran, MD, Anna Rose Johnson, MD, Changyu Shen, PhD, Edward S. Lee, MD, Bernard Lee, MD, MPH, MBA**

*Beth Israel Deaconess Medical Center, Boston, MA, Rutgers Medical School, Newark, NJ, Harvard Medical School, Boston, MA, USA*

**PURPOSE:** Obesity is a known risk factor for donor wound complications in abdominal based microsurgical breast reconstruction. Closed incision negative pressure therapy (ciNPT) has been used anecdotally in high-risk patients to prevent wound complications and infection. Due to the shortage of ciNPT studies in plastic surgery literature, we conducted a systematic review to evaluate the efficacy of this device in reducing wound complications and infection in complex abdominal reconstruction cases and its applicability in abdominal based microsurgical breast reconstruction.

**METHODS:** A literature search of the English literature in the PubMed/MEDLINE database (2006–2016) was