have a high risk of complications. SI/BW is useful for preoperative risk assessment of patients. In conclusion, SI/BW, which can be evaluated only by blood sampling, is simple and useful, and the results can be used for patient evaluation, efficient intervention, and risk management.

Category: Knee - Osteoarthritis

An Examination of the Frequency of the Central Sensitization in Patients with Knee Osteoarthritis with Chronic Pain and its Association with Patient-Reported Outcome Measures

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Summary:
Examination of correlation between Central Sensitization and PROMs

Data:
Objective Chronic pain associated with knee osteoarthritis (KOA) has been shown to involve not only nociceptive pain but also peripheral and central nerve sensitization. However, there are few reports comparing central sensitization (CS) to the severity of deformity, versus patient-reported outcome measures (PROMs) and we aim to investigate these relationships. Methods 78 KOA patients (male/female = 30/48, mean 63.6 ± 11.8 years, KL2/3/4 = 29/28/21) who first visited our hospital between June and July 2022 with chronic pain refractory to conservative treatment were included in the study, and PROMs and CS were assessed by a self-administered questionnaire (Central Sensitization Inventory [CSI]). The severity levels were divided into the following point categories; subclinical (0-29 points), mild (30-39 points), moderate (40-49 points), severe (50-59 points), and extreme (60-100 points). A CSI score of 30 or higher was defined as having CS. The correlation between CSI score and KL classification, tibiofemoral angle (FTA), % mechanical axis (% MA), Visual Analogue Scale (VAS), Knee injury and Osteoarthritis Outcome Score (KOOS), Japanese Knee Osteoarthritis Measure (UKOM) was examined. Statistical analysis was performed using SPSS ver. 28 with Spearman’s rank correlation coefficient. Comparison among the three groups was performed by one-way ANOVA, followed by post-hoc test using the Tukey-Kramer method. The significance level was set at 5%. Results The mean CSI score was 20.1 ± 10.4. CS occurred in 16.7% of patients (CSI score ≥ 30), the quantity of subclinical/mild moderate patients was 11/1/1 respectively. KL2, KL3 and KL4 patients had CS in 3 (10.3%), 5 (17.8%), and 5 (23.8%) patients. There were no significant differences between the groups (p = 0.45). FTA and %MA showed no correlation with the CSI score (p = 0.74/0.68). VAS, KOOS-ADL, KOOS-QOL, KOOS-pain, JROM and CSI scores were significantly correlated (r = 0.24, p = 0.03; r = 0.48, p = 0.01; r = 0.26; p = 0.02; r = 0.31, p = 0.007; r = 0.41, p = 0.01). Only KOOS symptom did not correlate with the CSI score (p = 0.05). Summary and Discussion Our findings indicate that there was a correlation between CSI and PROMs, but not with KOA severity or lower limb alignment. 16.7% of KOA patients had CS, but it has been reported that KOA patients with CS often have persisting residual pain after operations such as joint replacement surgery. In conclusion, it is necessary to evaluate not only PROMs but also CSI in patients with chronic pain to determine a correct treatment plan.

Category: Knee - Osteoarthritis

Successful Isolation Of Viable Stem Cells From Cryopreserved Microfragmented Human Abdominal Adipose Tissue from Patients With Knee Osteoarthritis

Abstract ID# 22421
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Summary:
Viable stem cells can be successfully isolated and expanded from cryopreserved microfragmented adipose tissue using both tissue explant culture and enzymatic digestion

Data:
Background: Microfragmentation is a new non-enzymatic, mechanical one-step procedure to process stem cells from adipose tissue (AT) for usage directly in the operation theatre. Treatment of knee osteoarthritis with autologous stem cells from microfragmented AT has shown promising results. Cryopreservation and biobanking of stem cells are becoming increasingly important for research purposes, treatment of aged patients, and for repetitive treatments to improve long-term outcomes without the need for additional liposapiations. Isolation of viable stem cells from cryopreserved whole liposapiars have been described, but not from cryopreserved microfragmented AT. Aim: To investigate if viable stem cells could be isolated and expanded from cryopreserved microfragmented AT harvested from knee osteoarthritis patients by two different isolation methods; (1) tissue explant culture (TEC), and (2) enzymatic digestion (ED). Materials and Methods: Microfragmented subcutaneous abdominal AT from knee osteoarthritis patients was cryopreserved in cryomedium containing 10% dimethyl sulfoxide (DMSO) cryoprotectant at -80 degrees Celsius. The samples were thawed and rinsed for stem cell isolation by TEC (non-enzymatic) and ED (with 1 mg/mL collagenase type I), respectively. Viability, population doublings, and doubling time was assessed by trypan blue staining. Cell type and senescence-associated β-galactosidase activity were measured by flow cytometry. Osteogenic and adipogenic differentiation was assessed quantitatively by Alizarin Red S and Oil-Red-O staining, respectively. Statistical analysis was performed using paired t-tests. Normality of data was confirmed using Shapiro-Wilk tests and QQ-plots. p-values < 0.05 were considered statistically significant. Results: Microfragmented AT from 7 patients (5 females and 2 males, age 41 to 63 years) was cryopreserved for a period of 46-150 days (mean (SD) 115.9 days (44.3 days)). Viable stem cells were successfully recovered and expanded from all patients using both isolation methods with no significant difference in viable population doublings or doubling time from passage 1 to 3 (p > 0.05). Low levels of senescence-associated β-galactosidase activity was detected for both methods. Stemness was verified by stem cell surface markers and osteogenic and adipogenic differentiation performance. Adventitial stem cells (CD31+/CD34+ /CD45-/CD90+/CD146-, pericytes (CD31-/CD34-/CD45-/CD90+ /CD146+), transitional pericytes (CD31-/CD34+ /CD45-/CD90+/CD146+), mesenchymal stem cells (CD34-/CD45-/CD90+), and CD271+ stem cells (CD31-/CD34-/CD90+/CD271+) were identified using both methods. More pericytes were present when using TEC (25% (24%)) compared to ED (2% (2%)) at passage 4 (p = 0.04). Conclusion: Viable stem cells can be isolated and expanded from cryopreserved microfragmented AT using both TEC and ED. The TEC isolation method provides more clinically relevant pericytes than ED. For research purposes, the TEC method is believed to be more representative of treatment with microfragmented AT as no enzymes have been applied.

Category: Knee - Osteoarthritis

Availability and Price Variation in Platelet-Rich Plasma Injections at Top Ranked Orthopedic Centers in the U.S

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Summary:
This is a prospective study investigating geographic variation in availability and pricing of platelet-rich plasma injections for knee osteoarthritis. Data: Background: Demand for costly cash-pay platelet-rich plasma (PRP) injections for knee osteoarthritis (OA) has dramatically increased in recent years despite a lack of consensus on its efficacy. This off-label use is not covered by insurance and patients often pay $700 per PRP injection, generally administered in a series of 3. Given increasing demand for PRP, hypothesized price.
variation and the significant financial burden on patients, we aim to: 1) report the availability and pricing of PRP at top-ranked orthopedic institutions, 2) characterize the availability of pricing information over the phone, and 3) determine which hospital characteristics are associated with PRP pricing. Methods: In this prospective study (Institutional Review Board approval 21-01820), telephone calls were used to obtain price estimates from a sample of 100 hospitals (top 25 from each U.S. Census region) selected from the U.S. News & World Report ranking of Best Hospitals for Orthopedics. A standardized script was used to determine the availability and price of a PRP injection for knee OA. Hospital characteristics were extracted from American Hospital Association data. Analyses were stratified by region. Spearman’s rank correlations assessed the association between (continuous) hospital characteristics and PRP pricing. Analyses were performed using SAS statistical software, version 9.4. Results: Overall, 87% of respondents at top-ranked orthopedic institutions stated that they offered PRP injections; of these, 68% (59/87) were willing to disclose PRP pricing information over the phone. PRP pricing ranged from $350.00 to $2,815.00 (median $800) per injection with the highest prices observed in the Northeast. The largest pricing range was observed in the Midwest while over two thirds of hospitals that disclosed pricing were in the $500-$1,000 price range. No significant correlations were observed between PRP price and continuous hospital characteristics. Discussion: Our results demonstrate there is substantial PRP price variability between providers, and pricing is not correlated with various continuous hospital characteristics. These data provide important insights given the increasing research and clinical interest in the use of PRP for knee OA and its cost-effectiveness. Indeed, recent cost-effectiveness research comparing PRP injections to hyaluronic acid or immediate total knee arthroplasty show that the high cost of PRP continues to be an issue relative to its purported effectiveness. While a 2017-2018 study of providers advertising PRP injections online identified significant variation in claims of effectiveness, incremental evidence has come supporting the efficacy of PRP, and an increasing number of providers are offering PRP. By improving transparency in PRP pricing within the mainstream orthopedic community, this investigation provides a useful resource for pricing comparisons and future investigations of the financial burden and cost-effectiveness of PRP injections. Study limitations include those related to generalizability; not all hospitals wished to disclose their prices, and PRP for other indications may have different price variations. Moreover, we cannot rule out that hospitals with higher prices could have been more likely to withhold pricing disclosure. In conclusion, our study provides important insights into geographic differences in pricing for PRP injections for knee OA.

Category: Knee - Osteoarthritis

Injectable Cell-Based Therapy For Knee Osteoarthritis Improved Joint Function at Long Term Follow-Up

Abstract ID# 23125
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Summary:

INJECTABLE CELL-BASED THERAPY FOR KNEE OSTEOARTHRITIS IMPROVED JOINT FUNCTION AT LONG TERM FOLLOW-UP

Data:

Aim: Cell-Based Therapies are currently part of first-line treatment for knee osteoarthritis. Intra-articular injection of Adipose-derived Mesenchymal Stem Cells (AD-MSCs) is one of the options. This study aims to present 6-year results and the safety profile of this treatment option. Materials & Methods: Twenty patients with knee osteoarthritis (Kellgren-Lawrence I-II) were treated with a single intra-articular injection of autologous culture-expanded adipose-derived MSCs. The patients were evaluated before the injection and in 3rd, 6th, 12th month and every year after the 1st post-treatment year. The final follow-up time point was 6th year. Four subscales (Pain, Symptoms, Activity in Daily Living and Quality of Life) of the KOOS questionnaire were used to quantify the results. Treatment-related complications were also recorded. Results: The data analysis recorded a significant improvement (p < 0.001) in all the values at the final follow-up compared to the baseline. In particular, the KOOS subscales for Pain and Symptoms constantly increased between all the evaluation points. However, no statistical improvement was recorded in the 2nd and 3rd years after injection. Again, a statistically significant difference was found in the KOOS subscale of ADL from the 1st year after injection to the last evaluation. Finally, the subscale of QOL was found to be significantly higher at each evaluation point. No complications or adverse events were reported. Conclusion: Cell-Based Therapy using adipose-derived MSCs is a safe injectable treatment option for knee osteoarthritis, reduces pain levels, and improves joint function. Keywords: Injectable Cell-Based Therapy, knee osteoarthritis, adipose-derived MSCs

Efficacy Of Intra-Articular Injection Of Freeze-Dried Platelet Rich Plasma In A Rat Knee Osteoarthritis Model And Characteristics Of Growth Factors Enhanced By Inflammation

Abstract ID# 23007
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Summary:

This study provided the experimental evidence that in knee OA rats model, FD-PRP injection exhibited a histologically and behaviorally significant improvement. In terms of the timing to manufacture the FD-PRP, no inflammation group was significantly higher concentration of PDGF-BB having a capability of a chondrogenic bioactivity. It is suggested that FD-PRP might have the potential to have an efficacy on a mild OA.

Category: Knee - Osteoarthritis