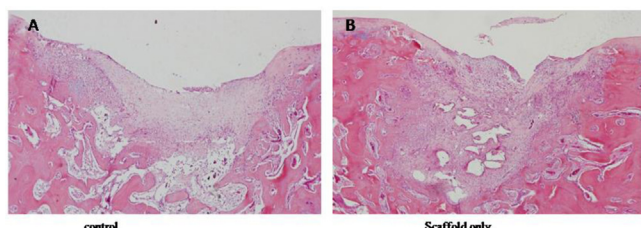
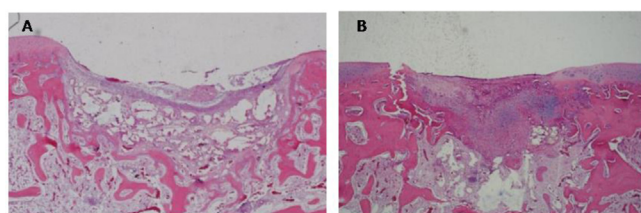


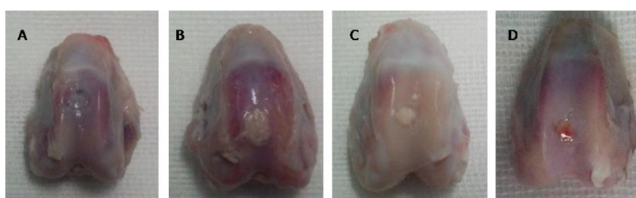
3 weeks after surgery.
 Figure A: control
 Figure B: scaffold only
 Figure C: ips-msc induced for 5 days
 Figure D: ips-msc induced for 21 days



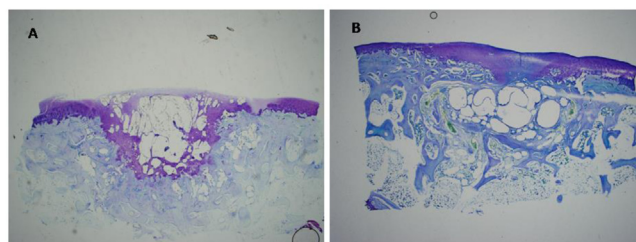
control Scaffold only



iPSC-MSCs induced for 5 days in vitro iPSC-MSCs induced for 5 days in vitro
 HE staining of the defects repair 3 weeks after surgery



6 weeks after surgery.
 Figure A: control
 Figure B: scaffold only
 Figure C: ips-msc induced for 5 days
 Figure D: ips-msc induced for 21 days



iPSC-MSCs induced for 5 days in vitro iPSC-MSCs induced for 5 days in vitro

Toluidine blue staining of the defects repair 6 weeks after surgery

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A NOVEL AUTOLOGOUS PLASMA BASED VISCOSUPPLEMENTATION

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Purpose: Combined long acting viscosupplement and autologous cartilage promoting factors for the treatment of osteoarthritis.

Methods: RegenGel-SP is a novel elastomer made of fibrinogen enriched plasma chemically linked to high molecular weight Hyaluronic acid (HA). Plasma fibrinogen-HA conjugate solution polymerized by CaCl_2 was seeded with primary human articular chondrocytes. Cell viability and potency in the 3D constructs were evaluated using Alamar blue, DMMB for sulphated glycosaminoglycans (sGAGs) and quantitative rtPCR for chondro-specific markers.

Results: In the last OARSI meeting we presented a novel Fibrin-HA conjugate as a long acting viscosupplement and as a carrier for the disease modifying agent FGF18 or its FGF receptor selective variants. To further enhance the biological properties of the hydrogel, a similar chemical approach was implemented using whole human plasma conjugated to high molecular weight Hyaluronic acid. This self plasma based hydrogel designated RegenGel-SP demonstrated remarkable physical endurance and biocompatibility to diverse primary cell types. Specifically, RegenGel-SP demonstrated superior capacity to support cell proliferation, viability and differentiation of human articular chondrocytes from both normal and OA cartilage.

Conclusions: We have previously reported on the regenerative and cell supportive activity of Fibrin-HA compositions combined with FGF18 variants. The newly developed RegenGel-SP provides a novel and safe approach for delivering autologous plasma rich constituents in a stable, long acting, viscous support for cartilage preservation and repair in OA.

Rehabilitation

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RELATIONSHIP BETWEEN TOE GRIP STRENGTH AND OSTEOARTHRITIS OF THE KNEE: A PRELIMINARY STUDY

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Purpose: Toe flexor function is important for balancing and walking. However, we often encounter knee osteoarthritis (OA) patients who cannot touch their toes to the ground, and therefore, the toes do not function during walking. We hypothesised that toe function is affected with knee OA and investigated the relationship between knee OA and toe grip strength (TGS).

Methods: Seventy-eight knee OA patients (12 men and 66 women; mean age, 73.5 ± 7.3 years; OA group) and 71 healthy community-dwelling individuals (13 men and 54 women; mean age, 72.5 ± 5.5 years; control group) participated in the study. With regard to Kellgren-Lawrence grading in the OA group, 8 subjects had grade 2, 32 had grade 3, and 38 had grade 4. The control group comprised individuals without any pain and knee malalignment, who could walk without aid. The outcome measures were body mass index (BMI), TGS, and isometric knee extension strength (IKES). The TGS and IKES were measured twice using a toe grip dynamometer and hand-held dynamometer, respectively, and the mean values were calculated. Data were collected on the affected side in the OA group and non-dominant side in the control group. The dominant foot was identified as the one preferred for kicking a ball. Data were compared between the 2 groups using an unpaired *t*-test. Moreover, multiple logistic regression analysis was performed. The independent variable was the group and the dependent variables were age, sex, BMI, TGS, and IKES. The significance level was set at 5%. The local ethics committee approved the study, and all subjects provided written informed consent prior to study participation. This study was supported by JSPS KAKENHI Grant Number 25870971.

Results: The BMI was significantly higher in the OA group (25.5 ± 3.5) compared to the control group (21.7 ± 2.6), whereas the TGS and IKES in the OA group (7.4 ± 4.2 kg and 15.3 ± 6.9 kg, respectively) were significantly lower than in the control group (11.6 ± 5.2 kg and 26.8 ± 7.5 kg, respectively). According to multiple logistic regression analysis, the sex (odds ratio [OR]: 0.05, 95% confidential interval [95%CI]: 0.01–0.32), BMI (OR: 1.98, 95% CI: 1.49–2.63) and IKES (OR: 0.71, 95% CI: 0.63–0.80) were associated with OA.