

RMOS | REGENERATIVE
MEDICINE
ORTHOPAEDIC SOCIETY

3rd REGENERATIVE MEDICINE ORTHOPAEDIC SUMMIT



FROM 30 NOVEMBER
TO 02 DECEMBER

2023



**ISTANBUL
TÜRKİYE**



VENUE
swissôtel **THE BOSPHORUS**
ISTANBUL



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WELCOME

Dear **Friends and Colleagues**,

Following the great successes of our past summits in Athens and Naples, we are moving forward with even more enthusiasm. We invite you to join us for the **3rd Regenerative Orthopaedic Summit**, taking place in the beautiful city of **Istanbul**, from **November 30th to December 2nd**, at the **Swissotel The Bosphorus**.

Our focus remains steadfast on advancements in joint preservation. This year, we are bringing together over **70 expert** speakers and collaborating with more than **10 respected organizations**. With attendees from over **32 countries**, the summit promises rich discussions and valuable learnings.

We are excited about the possibilities this summit offers, and we believe your participation will make it even more impactful.

Join us in Istanbul for an engaging and informative experience. Together, we can shape the future of orthopaedic medicine.



Dr. Fabio Sciarretta
Summit Scientific Chair



Prof. Dr. Tahsin Beyzadeoglu
Summit President



Ass. Prof. Georgios Skarpas
Summit Scientific Co-Chair

The Regenerative Medicine Orthopaedic Society (RMOS) was brought to life in 2022 by Prof. Tahsin Beyzadeoglu and Ass. Prof. George Skarpas. Fueled by a shared conviction in the potential of regenerative medicine to revolutionize orthopaedics, they saw the need for a dedicated forum to promote, explore, and advance this innovative field.

Their vision became the blueprint for RMOS – an organization dedicated to transforming orthopaedic care through regenerative medicine. In this pursuit, we are guided by an unwavering commitment to scientific integrity, patient welfare, and the creation of an inclusive, collaborative community.

Our society is a vibrant and diverse network of orthopaedic surgeons, researchers, healthcare professionals, biotech firms, and policy advocates. This broad coalition brings together complementary skills, experiences, and perspectives, fostering an environment that encourages learning, knowledge exchange, and collaboration. Each member contributes uniquely to the evolution of our field and benefits from the shared knowledge and opportunities provided by the society.

Since our inception, RMOS has been at the forefront of breakthroughs in regenerative medicine applied to orthopaedics. We have conducted successful international summits, bringing together experts from around the world to share insights and drive progress. These gatherings have served as vital platforms for knowledge dissemination, idea generation, and collaborations that propel the advancement of regenerative medicine within orthopaedics.

Our success has also been fueled by significant collaborations with other organizations, academic institutions, and industry partners. These strategic alliances have not only expanded our reach but also enriched our resources and capabilities. Together, we strive to navigate the challenges and opportunities in our path to ensure that regenerative medicine reaches its full potential in orthopaedics.

Looking towards the future, RMOS is committed to building upon its robust foundation. We aim to expand our global footprint, increase membership, boost our research contributions, and enhance our educational programs. Above all, we continue to prioritize our central goal – to improve patient outcomes and quality of life by incorporating regenerative medicine in the standard orthopaedic practice.

At RMOS, we believe that our collective efforts will forge a new era in orthopaedics where regenerative therapies become mainstream, marking a significant leap forward in patient care.

MISSION OF RMOS

Our mission at the Regenerative Medicine Orthopaedic Society (RMOS) is to pioneer the integration of regenerative medicine in orthopaedic care, thereby transforming the way we treat musculoskeletal conditions and injuries. This mission is grounded in four key objectives:

1

Promotion of Research: We aim to stimulate high-quality, ethical research in regenerative medicine and orthopaedics. We advocate for research that seeks to understand, develop, and refine regenerative therapies for various orthopaedic conditions. Through funding initiatives, collaboration with academic and industry partners, and the provision of research platforms, we endeavor to foster an environment conducive to scientific exploration and innovation.

2

Dissemination of Knowledge: We are committed to creating and disseminating knowledge about regenerative medicine within the orthopaedic community. Through our summits, publications, online platforms, and educational programs, we share the latest research findings, clinical experiences, and policy developments related to regenerative medicine.

3

Fostering Collaborations: Recognizing that progress is accelerated through collective effort, we strive to cultivate collaborations among professionals in the field. By facilitating connections between researchers, clinicians, policymakers, and industry leaders, we aim to catalyze the development and application of regenerative medicine in orthopaedics.

4

Advocacy: We advocate for policies and regulations that support the ethical and effective adoption of regenerative medicine in orthopaedic clinical practice. This includes engagement with healthcare institutions, governmental agencies, and other regulatory bodies to ensure a conducive environment for the implementation of regenerative medicine.

In fulfilling our mission, we at RMOS are driven by a steadfast dedication to improving patient outcomes and advancing the field of orthopaedics. We firmly believe that regenerative medicine represents the future of orthopaedic care, and we are committed to making that future a reality.

As the Regenerative Medicine Orthopaedic Society (RMOS) continues to grow and evolve, we look forward to pursuing several key initiatives aimed at furthering our mission:

1

Expanding Research Initiatives: We plan to broaden our research scope in regenerative medicine and orthopaedics, focusing on both fundamental and translational research. By supporting multidisciplinary research projects, we hope to catalyze the development of innovative regenerative therapies for a wider range of orthopaedic conditions.

2

Enhancing Education and Training Programs: We aim to develop more comprehensive and accessible education and training programs. Our goal is to reach a broader audience, including healthcare professionals, students, patients, and the public, to increase awareness and understanding of regenerative medicine in orthopaedics.

3

Increasing Global Presence: We will continue to grow our membership and establish partnerships worldwide. Hosting more international summits and events is a key part of this strategy, allowing us to bring together global experts, facilitate knowledge exchange, and foster collaborations.

4

Strengthening Policy Advocacy: We plan to expand our policy advocacy efforts to promote a favorable regulatory environment for regenerative medicine. We will engage more actively with policymakers, regulatory bodies, and other stakeholders, advocating for policies that support the safe and effective use of regenerative therapies in orthopaedic practice.

5

Developing Patient Outreach Programs: We aim to establish programs that engage directly with patients. These initiatives will focus on educating patients about regenerative therapies, providing resources, and addressing their concerns and queries.

6

Promoting Industry Collaboration: We intend to strengthen our relationships with biotech and pharmaceutical companies to accelerate the translation of research into clinical practice. Joint efforts in research, development, and clinical trials will ensure that innovative treatments reach patients more quickly.

7

Building a Digital Platform: We plan to build an online platform that will serve as a repository of information, a networking hub, and a platform for online training and webinars. This digital hub will enable us to reach out to a global audience, expanding our impact.

8

Sustainability: We aim to ensure the long-term sustainability of RMOS. This includes securing funding for our initiatives, maintaining the engagement and growth of our membership, and continuously adapting to the evolving needs and opportunities in the field of regenerative medicine and orthopaedics.

At RMOS, we remain committed to our mission, and we are excited about the opportunities that lie ahead. Through our efforts, we hope to continue driving progress in the field of regenerative medicine in orthopaedics and improving the lives of patients worldwide.

OUR VALUES AT RMOS

The Regenerative Medicine Orthopaedic Society (RMOS) is guided by a set of core values that underpin our work and our interactions within our society and the broader community. These values serve as our compass, shaping our strategies, decisions, and behaviors.



Scientific Integrity: We uphold the highest standards of scientific rigor and ethical conduct in all our research activities. We believe that robust, reproducible, and transparent research is fundamental to the advancement of regenerative medicine in orthopaedics.



Patient-Centered Approach: Our ultimate goal is to improve patient outcomes and quality of life. Every decision we make, every project we undertake, and every policy we advocate for is evaluated on how it will impact the patients we serve.



Innovation: We are committed to fostering an environment that encourages creativity, risk-taking, and innovation. We believe that groundbreaking ideas and techniques are vital to revolutionizing the field of orthopaedic care.



Collaboration: We recognize that progress is not a solitary endeavor, but a collective effort. We strive to cultivate an inclusive, collaborative community where every member feels valued, heard, and inspired to contribute to our shared mission.



Education: We are dedicated to facilitating learning and knowledge dissemination within our society and beyond. We believe in empowering healthcare professionals and the public with accurate, up-to-date information about regenerative medicine in orthopaedics.



Advocacy: We are committed to advocating for regulatory frameworks that support the ethical, safe, and effective application of regenerative medicine in orthopaedic practice. We actively engage with policy-makers and stakeholders to achieve this.



Respect: We uphold a culture of mutual respect, where diversity of thoughts, experiences, and backgrounds are appreciated and leveraged to enrich our society and the field of orthopaedics.

These values are the pillars of RMOS. They define who we are, what we stand for, and how we strive to make a positive impact in the realm of orthopaedic care. By staying true to these principles, we seek to fulfill our mission and vision, leading the way in transforming orthopaedic care through regenerative medicine.

What do you get as our member?

- ➔ Listing in the RMOS roster
- ➔ 50% reduced registration fee for RMOS summits
- ➔ 20% discount in RMOS Workshop/Course fees
- ➔ Opportunity to become an invited speaker
- ➔ Opportunity to be actively involved in exciting and impactful projects
- ➔ The possibility to promote your survey to the RMOS community

RMOS | REGENERATIVE
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PAST SUMMITS

1st REGENERATIVE MEDICINE ORTHOPAEDIC SUMMIT

DECEMBER 1-3, 2022
ATHENS, GREECE

The first Regenerative Medicine Orthopaedic Summit took place in Athens, Greece on December 1-3, 2022 with the participation of international experts on joint preservation, orthobiologics and regenerative therapies. The event provided an opportunity for fruitful discussion and networking for the participants, laying the groundwork of future RMOS events.



Ass. Prof. Georgios Skarpas
President
RMOS Athens Summit 2022



Prof. Dr. Tahsin Beyzadeoglu
President
Global Regenerative Academy



Prof. Panagiotis Skandalakis
Honorary President
RMOS Summit



2ND REGENERATIVE MEDICINE ORTHOPAEDIC SUMMIT

11-13 MAY NAPLES, ITALY

We are really honoured to welcome all of you in Italy, in the wonderful Naples, to discuss how to “build your innovation: tips and tricks in regenerative orthopaedics”



Ass. Prof. Georgios Skarpas
RMOS Founder



Dr. Fabio Sciarretta
Summit President



Prof. Dr. Tahsin Beyzadeoglu
RMOS Founder



COLLABORATING ORGANIZATIONS



ACCREDITED BY



SCIENTIFIC BOARD



Prof. Tahsin Beyzadeoglu



Dr. Fabio Sciarretta



Ass. Prof. Georgios Skarpas



Dr. Dzhilan Abazovic



Prof. Reha Tandogan



Prof. Alan Ivkovic



Dr. Rowan Paul

SCIENTIFIC PROGRAM

30 NOVEMBER 2023, THURSDAY

12:00–13:30	REGISTRATION	
13:30–13:45	Opening Remarks: The Vision of RMOS	Tahsin Beyzadeoglu
SESSION 1	INSIDE THE BONE & JOINT: ON THE SHOULDER OF FOUNDATIONS Moderators: Alan Ivkovic , Lucienne Vonk	
13:45–14:00	Structure & Function of the ON Foundation	Emmanuel Papakostas
14:00–14:15	Experimental Translational Research & Regeneration Protocols: Vision & Challenges	Apostolos Papalois
14:15–14:30	Biomechanics of Fracture Repair	Ivan Zderic
14:30–14:45	Evaluating Synovial Fluid by Omix Technology: Where Are We Now?	Feza Korkusuz
14:45–15:00	Stem Cell Exosome–Nanocomposite Based Therapies for Targeted Bone Regeneration: Are We Ready for Translation?	Petek Korkusuz
15:00–15:15	Discussion	
SESSION 2	PROGENITOR CELL BIOLOGY ACADEMY: INSIGHT FROM THE LABS Moderators: Fabio Sciarretta , Petek Korkusuz	
15:15–15:30	Poly NIPPAm–Immobilized Microporous Microsphere as Cell Carrier for Bone Marrow MSCs Proliferation	Feng-Huei Lin
15:30–15:45	Synovioblast in Polyclonal Therapy: New Approach to Knee Cartilage Regeneration	Dusan Maric
15:45–16:00	Improving Cartilage Regeneration Through Enhanced Healing Mechanisms: Basic Science & Clinical Progress	Dzihan Abazovic
16:00–16:15	The Use of Novel Advances in Machine Energy Modalities to Condition Stem Cells & Augment Regenerative Procedures	Rowan Paul
16:15–16:30	Discussion	
16:30–17:00	COFFEE BREAK	
SESSION 3	EXOSOME ACADEMY: FROM LABS TO CLINICAL APPLICATIONS Moderators: James Loh , Ramon Cugat	
17:00–17:15	Pre-clinical Evidence of MSC Derived Exosomes	Lucienne Vonk
17:15–17:30	MSCs & Exosomes for Systemic Treatment of Inflammation	Nesrin Ercelen
17:30–17:45	Exosomes & Regenerativ Visual Studio Code.app e Medicine: A Practical Guide	Pradeep Albert
17:45–18:00	The Role of Exosomes in Cartilage Defects	Gokhan Meric
18:00–18.15	Exosomes 2024	Stephen Abelow
18:15–18:30	Discussion	

SCIENTIFIC PROGRAM

1 DECEMBER 2023, FRIDAY

07:00–08:00	COFFEE & LIGHT BREAKFAST SERVICE	
SESSION 4	MENISCUS ACADEMY: UPDATED MENISCAL REPAIR, RECONSTRUCTION & AUGMENTATION TECHNIQUES Moderators: Robert Smigielski, Michael Iosifidis	
08:00–08:15	Meniscus Root Tears: Diagnosis & Treatment	Panagiotis Kouloumentas
08:15–08:30	Meniscal Repair in Patients Over 40 Years Old	Horacio Rivarola Etcheto
08:30–08:45	Treatment of Meniscal Variations	Ahmet Atay
08:45–09:00	Meniscus Transplantation with Autogenous Hamstring Graft	Engin Cetinkaya
09:00–09:15	Meniscal Allograft Transplantation	Theofylaktos Kyriakidis
09:15–09:30	Scaffolds in Meniscus Repair: Indications & Long-term Results	Konrad Slynarski
09:30–09:45	Discussion	
09:45–10:05	COFFEE BREAK	
SESSION 5	ACL ACADEMY: IMPROVING SURGICAL OUTCOMES FOR REPAIR & AUGMENTATION & RECONSTRUCTION Moderators: Reha Tandogan, Alberto Gobbi	
10:05–10:20	ACL Repair, Augmentation vs. Reconstruction	Alessandro Lelli
10:20–10:35	Primary ACL Repair: Lesson Learned	Umer Butt
10:35–10:50	Biological Boost for ACL Reconstruction & Mechanical Enhancement of ACL Repair	Damir Hudetz
10:50–11:05	Lateral Augmentation: An Approach & Preference	James Loh
11:05–11:20	Biological Advantages "Ribbon" ACL Reconstruction Technique	Robert Smigielski
11:20–11:35	ACL Reconstruction & Osteoarthritis	Christos Papageorgiou
11:35–11:50	Discussion	
SESSION 6	CARTILAGE ACADEMY I: DIFFERENT OPTIONS FOR CARTILAGE REPAIR Moderators: Dzihan Abazovic, Feza Korkusuz	
11:50–12:05	Injections in OA of the Knee	Vasilis Chouliaras
12:05–12:20	Scaffold for Cartilage Repair: With or Without Cells?	Hassan Zmerly
12:20–12:35	One-stage ACL with CartiONE	Emmanuel Papakostas
12:35–12:50	Early Knee Osteoarthritis: Arthroscopic Regenerative Treatment Using Umbilical Cord MSCs	Boguslaw Sadlik
12:50–13:05	BMAC for the Treatment of Bone Marrow Lesions	Alan Ivkovic
13:05–13:20	The Athletic Knee in 2023: A Patient-centered Regenerative Rehabilitation Approach	John Nyland
13:20–13:30	Discussion	
13:30–14:30	 ARTHROSAMID <small>VT BİYÖLOJİK SAĞLIK ÜRÜNLERİ S.M. VE T.C. LTD. ŞTİ.</small>	LUNCH SYMPOSIUM Treating the Synovial Membrane with Arthrosamid: My Experience for the First 100 Patients Prof. Paul YF Lee
SESSION 7	CARTILAGE ACADEMY II: ON THE SHOULDER OF GIANTS Moderators: Konrad Slynarski, Stephen Abelow	
14:30–14:45	One-stage Cartilage Repair Using a Hyaluronic Acid-Based Scaffold with Adipose-derived MSCs	Fabio Sciarretta
14:45–15:00	Mosaicplasty Long-term Results: Systematic Review of 15-years Plus Cases	Laszlo Hangody
15:00–15:15	Treatment of Cartilage Lesions with Fat-derived MSCs	Isik Akgun
15:15–15:30	Cartilage Surgeon	Bashir Ahmed Zikria
15:30–15:45	Autologous PRP & Minced Cartilage Mesh for Cartilage Defects	Ramon Cugat
15:45–16:00	Cartilage Lesions Accompanying Patellofemoral Instability	Reha Tandogan
16:00–16:15	My 25-years Experience in Cartilage Transplantation	Alberto Gobbi
16:15–16:30	Discussion	
16:30–16:50	COFFEE BREAK	
SESSION 8	(SALOON 1) FREE PAPERS (JOINT PRESERVATION & MUSCULOSKELETAL REGENERATION)	
16:50–18:50	Moderators: Spiros Plessas, Damir Hudetz	
17:00–18:30	 bioventus	(SALOON 2): HANDS-ON WORKSHOPS Ultrasound Guided Percutaneous Needle Tenotomy using the TENEX system Instructor: Rowan V. Paul

SCIENTIFIC PROGRAM

2 DECEMBER 2023, SATURDAY

07:00–08:00	COFFEE & LIGHT BREAKFAST SERVICE	
SESSION 9	SPORTS MEDICINE & MISCELLANEOUS Moderators: Rowan Paul , Horacio Rivarola Etcheto	
08:00–08:15	Long-term Perspective for Tissue Regeneration: MFAT Cryopreservation, When the Cure is in the Ice	Carlo Ventura
08:15–08:30	Regenerative Medicine Applications in Athlete's Knee	Alper Kaya
08:30–08:45	Utilizing Platelet-Rich Fibrin (PRF) in the Arthroscopic Treatment of Osteochondral Talar Lesions	Nikolai Dimitrov
08:45–09:00	Is There a Place for MSCs Surgical Implantation in Knee OA?	Trifon Totlis
09:00–09:15	Chronic Damage & Early OA in Athletes: What Happens in the Long Term?	Michael Iosifidis
09:15–09:30	Can We Apply the Neurocognitive Concept in Rehabilitation after Regenerative Orthopaedic Surgery?	Georgios Kakavas
09:30–09:45	Discussion	
09:45–10:05	COFFEE BREAK	
SESSION 10	SHOULDER ACADEMY: ORTHOBIOLOGICS IN CUFF REPAIR & RECONSTRUCTION Moderators: Ahmet Atay , Bashir Ahmed Zikria	
10:05–10:20	The Effect of PRP Application on Rotator Cuff Tear	Pericles Papadopoulos
10:20–10:35	Rotator Cuff Repair in Massive Tears	Roshan Wade
10:35–10:50	Superior Capsular Reconstruction	Raffaele Garofalo
10:50–11:05	Biceps tenodesis as a Scaffold for Massive Rotator Cuff Injury Treatment: A Non-invasive Alternative to SCR	Francesco Franceschi
11:05–11:20	Non-arthroplasty Treatment in Shoulder Arthritis	Gazi Huri
11:20–11:30	Discussion	
SESSION 11	HIP ACADEMY: PRESERVATION OF THE HIP JOINT Moderators: Georgios Skarpas , Ramazan Akmese	
11:30–11:45	The Role of Intraarticular Injections in Early Hip Osteoarthritis	Georgios Skarpas
11:45–12:00	The Role of Regenerative Medicine in Hip Arthroscopy	Athanasios Papavasileiou
12:00–12:15	Arthroscopic Labral Repair vs. Reconstruction: When & How?	Ramazan Akmese
12:15–12:30	Future of Hip Labrum Preservation: Orthobiology & Synthetic Options	Tahsin Beyzadeoglu
12:30–12:45	The Limits of Hip Preservation	Vikas Khanduja
12:45–13:00	Discussion	
13:00–14:15	LUNCH	
14:15–14:30	END OF MEETING & FAREWELL	



PROF. PAUL LEE

MSK DOCTORS AI, LONDON SPORTS INJURY
CLINIC, CARTILAGE CLINIC

“TREATING THE SYNOVIAL
MEMBRANE WITH
ARTHROSAMID:
MY EXPERIENCE FOR THE
FIRST 100 PATIENTS”

**DECEMBER 1
13:30-14:30**

With contributions of



ARTHROSAMID®



ROWAN V. PAUL

SPORTS MEDICINE, INTERVENTIONAL REGENERATIVE
ORTHOBIOLOGIST, PIONEER, EDUCATOR, ENTREPRENEUR,
MEDTECH ADVISOR

“ULTRASOUND GUIDED
PERCUTANEOUS NEEDLE
TENOTOMY USING THE
TENEX SYSTEM”

SALOON 2

**DECEMBER 1
17:00-18:30**

With contributions of



OP-01

RADIOLOGICAL AND CLINICAL RESULTS OF MEDIAL COLLATERAL LIGAMENT RELEASE IN ADDITION TO ARTHROSCOPIC DEBRIDEMENT IN PATIENTS WITH VARUS DEFORMITY AND STAGE 2/3 GONARTHROSIS

Bulent Kilic, Yunus Elmas, Orhun Celik, Avni Tan, Sefa Parlak

Health Sciences University Kanuni Sultan Suleyman Training and Research Hospital Orthopedics and Traumatology Clinic

Background: In our study, the objective was to lay out radiological and functional outcomes of gonarthrosis patients with varus deformity after medial collateral ligament (MCL) release in addition to the arthroscopic procedure which includes arthroscopic synovectomy, resection of the loose and torn parts of the central menisci followed by thermal shrinkage of the degenerated central edges and loose meniscocapsular ligaments.

Patients and Methods: The patients who were admitted to Kanuni Sultan Suleyman Training and Research Hospital Orthopedics and Traumatology Department between the years 2020 and 2022 and treated with arthroscopic surgery were included in the study. Patients with less than 12 months follow up were excluded. The included patients were divided into two groups. A total of 23 patients were found out to be eligible to be included in the study. Group A contained 13 patients who received additional percutaneous MCL release in addition to arthroscopic procedure and group B contained 10 patients who just received arthroscopic procedure. Radiological and clinical results were retrospectively evaluated. Radiological assessment was made on orthoroentgenograms, anteroposterior and lateral views. Radiological parameters included; mechanical and anatomic axis of lower limbs, lateral distal femoral angle (LDFA) and medial proximal tibial angle (MPTA). Varus deformities were identified according to increase in LDFA or decrease in MPTA compared to normale range of values. In the last outpatient clinic follow up; goniometric calculations of range of motion, functional and clinical evaluations using Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and visual analogue score (VAS) scores were made.

Results: The common symptom among patients was; knee pain, restricted knee range of motion and varus deformity. 14 () of the included patients were female and 9 () were male. Average age of the patients was 56.4 (42-76). Average knee flexion/extension range of motion was 124±8°. Average duration of symptoms among the patients was 36.8 (12-53) months. Minimal change of mechanical axis and decrease of sclerosis at medial knee compartment was identified in group A. Both groups demonstrated significantly improved WOMAC and VAS scores (p<0.05). Group A demonstrated significantly better functional and pain scores in addition to significant decrease in night pain.

Conclusion: The outcomes indicate that stage 2 and stage 3 gonarthrosis patients who are unresponsive to non-operative treatment modalities may highly benefit from appropriate surgical procedures. Furthermore, additional percutaneous MCL release to arthroscopic debridement significantly improved clinical and radiological outcomes.

The authors declare that there is no conflict of interest exists.

Keywords: Gonarthrosis, Knee arthroscopy, Percutaneous medial collateral ligament release

OP-02

WHERE ARE WE NOW? A 2023 REVIEW OF COLLAGEN MENISCUS IMPLANT AND ACTIFIT SCAFFOLDS IN CLINICAL PRACTICE

Disha Singhania, Chanuka D. S. Ranmuthu, Charindu K. I. Ranmuthu, Jodie C. Russell, Wasim S. Khan

University of Cambridge

Meniscal tissue engineering is based around forming a matrix that is a permissive environment for tissue regeneration. There are two commercially available scaffolds - one biologic (Collagen Meniscus Implant) and one synthetic (Actifit) polymer. In 2019 we published a PRISMA review of whether the biological and biomechanical properties of meniscal scaffolds were reflected in clinical practice. An additional 248 papers were screened from previous review at the end of 2018, which screened 2457 papers. The same inclusion and exclusion criteria were used: trials had to assess outcome either by the Yulish or International Cartilage Repair Society (ICRS) score and use the Genovese scale to assess both integrity of the scaffold and its effects on articular cartilage via MRI. An additional study was found to add to the previous data set, totalling five using Actifit, three using CMI and one comparing the two. Additional data continues to support positive clinical outcomes from meniscal scaffold implants with all studies reporting significant improvement in at least one clinical outcome compared to baseline. There was suggestion that scaffolds may have possible chondroprotective effects, however, in the most recent study, complete implant resorption was noted in 38%. There is a scarcity of additional higher level evidence from the last four years and this updated review again highlights the need for more data, particularly in context of concerns about chondroprotection. Limitations in making conclusions include inconsistent outcome measures and small sample sizes.

Keywords: meniscus, scaffold, regeneration, cartilage

OP-03

A 2023 UPDATE ON THE EFFECT OF NON-CELLULAR BIOACTIVE GLASS CONTAINING SCAFFOLDS ON OSTEOGENESIS AND ANGIOGENESIS IN VIVO

Disha Singhania, Chanuka D. S. Ranmuthu, Charindu K. I. Ranmuthu, Jodie C. Russell, Wasim S. Khan

University of Cambridge

Scaffolds that facilitate tissue regeneration in bone defects can be composed of a variety of biomaterials, bioactive glass being one of them. In 2020, we reviewed the outcomes of scaffolds containing bioactive glass in animal models. Studies that were included assessed osteogenesis with micro-CT and angiogenesis by either Microfil perfusion or immunohistochemistry. Promisingly, there has been a good rate of data publication over the last three years. In this updated review, we screened an additional 71 papers (132 screened in 2019) following the same inclusion criteria, of which an additional four studies met (from nine studies on previous review). Three of the additional studies showed significant benefits of bioactive glass alone compared to controls, whilst one did not. All papers showing improved osteogenesis and angiogenesis when additives were incorporated to bioactive glass scaffolds, consistent with previous review. There continues to be significant heterogeneity in scaffold composition and

methodology, which limits our ability to make conclusions, but the overall evidence till date suggests improved bone regeneration with bioactive glass containing scaffolds.

Keywords: bone, scaffold, osteogenesis, angiogenesis

OP-04- DOĞAN KIRAL - ABSTRACT. DOCXNAME: PODIUM PRESENTATION (8 MINUTES PRESENTATION) OR POSTER MANAGEMENT OF INFECTION, WOUND TISSUE PROBLEMS AND GRAFT FAILURE AFTER REPAIRED ACHILLES TENDON RUPTURE, RECONSTRUCTION AND SUPPORTING WITH PRP

Doğan Kırıl, Abdurrahman Vural, Tamer Atan,
Hüseyin Gökhan Karahan, Egemen Ayhan

Istanbul Çam & Sakura City Hospital

Achilles tendon is the largest and strongest tendon in humans lower extremities. Rupture of the Achilles tendon can be affecting ankle stability and gait efficiency. Achilles tendon rupture may become more complicated with possible wound infection and loss of skin tissue that would be considered tendon transferring. There is no standardized treatment protocol for such cases. In our study, we aimed to present healing treatment with PRP after repeated debridement, VAC treatment, semitendinosus transferring, keystone flap surgery in a patient with wound infection problem.

A 51-year-old male patient, who underwent primary Achilles tendon repair surgery in another clinic with the diagnosis of Achilles tendon rupture, was admitted to our clinic with the problem of wound infection on the 41st postoperative day. The patient was taken to the operating room primarily for radical debridement of infected and necrotic soft tissues.

In this patient, who developed tissue defects after repeated debridements and antibiotic treatment, semitendinosus autograft was removed from the same side and Achilles tendon reconstruction was performed. The tissue defect was closed with bilateral keystone shifting flaps. During wound follow-up, PRP were applied starting from the 2nd week of the surgery for 3 times, and the tissue recovery process was supported.

Results: The patient's wound healing was completed in 3rd week. Full weightbearing was allowed within 2 months after surgery range of motion was minimally reduced if compared to the contralateral side. Gait analysis showed the recovery of a nearly symmetrical stance phase, time to heel off, and step length of the gait.

Conclusion: Treatment options for Achilles tendon rupture may vary depending on the patient's condition and the severity of complications. In all cases, the goal of surgical intervention is to control infection, repair soft tissue, and restore function.

Keywords: achilles, failure, reconstruction

OP-05 A SIMPLIFIED FINITE ELEMENT ANALYSIS MODEL FOR STUDYING TALAR OSTEOCHONDRAL DEFECTS

Emre Özmen, Emre Kocazeybek

Istanbul Physical Therapy and Rehabilitation Department
of Orthopedics and Traumatology, Istanbul Haseki
Training and Research Hospital

Background: Talar osteochondral defects can present with symptoms ranging from asymptomatic to debilitating. Risk factors such as size and location have been proposed through clinical observations, however, a working biomechanical model of talar loading with these lesions is not present. This study aimed to create a simplified finite element analysis model for talar osteochondral defects to study the effect of lesion size and coronal location on the equivalent/yield stress percent on the cartilage surface.

Methods: An ankle CT belonging to a 57 year old male without trauma or previous ankle complaint history was segmented and 3D modeled in Mechanical Finder™ software. Keyak's conversion formula was used to convert Hounsfield units to Young's modulus for creating an inhomogenous bone model for talus and a homogenous bone model for tibia. A loading force of 1500 N was set on the tibial shaft in a directly vertical fashion, and the bottom half of the talus was fixed with zero degrees of freedom. Average, maximum and histogram of equivalent/yield stress percentage was evaluated.

Results: In the regression analysis, the size of the osteochondral defect was significantly associated with the equivalent/yield stress percent ($R^2 = 0.531$, $p = 0.001$), accounting for approximately 53.1% of the variance in mechanical properties. This finding suggests a statistically significant relationship between the defect size and the tissue's mechanical response. In the multiple regression analysis incorporating both size and type of osteochondral defect, the model accounted for approximately 62.5% of the variance in the equivalent/yield stress percent ($R^2 = 0.625$). While the size of the defect remained a significant predictor ($p = 0.001$), the type variable showed no statistically significant impact on the equivalent/yield stress percent (lateral: $p = 0.157$; lateral shoulder type: $p = 0.826$).

Conclusion: This is a simplified finite element analysis model of talar osteochondral defects under direct vertical loading in neutral position of the ankle. While the increase in size resulted in greater experienced forces in the cartilage surface in accordance with the worse clinical results in larger defects, location of the defect did not significantly affect the results. This points to discordance with the observations and the need for further refinement of the model, possibly including dynamic effects.

Keywords: biomechanics, finite element analysis, cartilage, talar osteochondral defect

ABSTRACTS

OP-06 ARTHROSCOPIC FIXATION OF POSTERIOR CRUCIATE LIGAMENT (PCL) TIBIA AVULSION FRACTURES: PULL AND PRESS TECHNIQUE AND CASE SERIES

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The posterior cruciate ligament (PCL) tibia avulsion fracture constitutes a low incidence of knee fractures. It can however have a debilitating effect on the knee such as reduction in the range of motion. The mechanism of injury is similar to intra-substance PCL injuries and is usually the result of a posteriorly directed force to the flexed knee such as a dashboard injury or a hyperextension of the knee in sports trauma. Literature review by Katsman et al had proposed that PCL fractures undergo surgical fixation when there is displacement of the fracture fragment. We describe the surgical technique established in our institution for arthroscopic fixation of PCL tibia avulsion fractures.

Results: 3 patients sustained a PCL tibia avulsion fracture after an accidental fall from their bike. They went for surgery within one month of the injury. They are discharged the day after surgery and underwent a protocolized PCL rehabilitation. By six months after surgery, all of them had achieved normal ambulation and are coping with their daily activities. Clinical assessment showed all had a minimal range of 0 to 110 degrees and a positive tibia step-off was maintained. The follow-up radiographs confirmed stability of the fracture.

Conclusion: Arthroscopic fixation of a PCL tibia avulsion fracture by the described technique had shown favourable outcomes in the three patients by six months after surgery. It is an option to address this challenging fracture.

Keywords: Posterior cruciate ligament, avulsion fracture, arthroscopic, fixation

OP-07 ULTRASOUND - GUIDED DRY NEEDLING VS ULTRASOUND - GUIDED DRY NEEDLING AUGMENTED WITH PLATELED - RICH PLASMA (PRP) INJECTION FOR THE TREATMENT OF LATERAL EPICONDYLITIS OF THE ELBOW. A RANDOMIZED CONTROL STUDY.

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Lateral epicondylitis, known as Tennis Elbow, is one of the most common causes of elbow pain in middle aged population. It is an overuse disorder characterized by microtears within the extensor muscles of the forearm. Although symptoms may alleviate with conservative treatment (rest, NSAIDs, physiotherapy, bracing etc.), in many cases they persist resulting in compromise of everyday activities and work productivity.

The purpose of this study was to compare the ultrasound - guided dry needling as single therapy option with the ultrasound -

guided dry needling augmented with PRP injection for the treatment of lateral epicondylitis of the elbow.

77 patients (51 male and 26 female, mean age 44.8 ± 4.5 years old) were diagnosed clinically and with ultrasonography with lateral epicondylitis and were divided in a randomized manner in 2 groups. 38 patients (25 male and 13 female) were treated with ultrasound - guided dry needling (Group 1), while in 39 patients (26 male and 13 female) were injected in addition 3cc of PRP right after the dry needling (Group 2). All patients were assessed with standard elbow radiographs to exclude other bony pathology. The intervention took place in the orthopaedic outpatient department of the hospital. The patients were evaluated clinically and with ultrasonography 4 and 12 weeks after the treatment. The Visual Analogue Scale with Resisted Wrist Extension (VAS-RWE) and the Patient-Rated Tennis Elbow Evaluation (PRTEE) were measured before treatment and 4 and 12 weeks after the treatment. The statistical significance level was set at $p < 0.05$.

Results: No statistical difference found between the two groups concerning their demographic data. The VAS-RWE baseline score was 8.9 ± 0.4 in Group 1 and it has been improved to 6.3 ± 0.6 at week 4 and 3.8 ± 0.8 at week 12. In Group 2, the VAS-RWE baseline score was 9 ± 0.7 and it has been improved to 2.3 ± 0.8 and 0.6 ± 0.7 at 4th and 12th week, respectively. The PRTEE baseline score was 58.5 ± 30.2 in Group 1 and it has been improved to 37 ± 19 at week 4 and 15.6 ± 5 at week 12, while in Group 2 from a baseline score of 62.2 ± 7 , there was an improvement of 24.3 ± 5.7 at week 4 and 4.4 ± 5 at week 12. No complications were noticed during the 12 weeks follow - up. There was statistical improvement ($p < 0.05$) in both groups during the follow up. The improvement in VAS - RWE and PRTEE was statistically significant higher in Group 2 compared to Group 1 ($p < 0.05$). All Group 2 patients were completely satisfied, free of symptoms and regained full activity, whereas in Group 1, 21 patients were completely free of symptoms and 17 referred improvement, but various difficulties in their work activity.

Conclusion: According to the outcomes of the present study, the treatment of lateral epicondylitis with ultrasound - guided dry needling augmented with PRP injection seems to have better results than dry needling as single therapy. Both methods are minimally invasive, with low cost and no need of hospitalization, no complications, relative easy learning curve, but the effectiveness of the augmentation with PRP seems to be superior. Although, further randomized control studies with larger population and longer follow - up are necessary to reach safer conclusions with regard of the efficacy of this method.

Keywords: tennis elbow, PRP, dry needling

OP-08 ULTRASOUND-GUIDED INJECTION OF PLATELET-RICH PLASMA FOR TREATMENT OF OSTEOARTHRITIS OF THE HIP: A 1 YEAR FOLLOW UP RETROSPECTIVE STUDY ON PAIN, FUNCTION AND SAFETY

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Background: The use of intra-articular platelet-rich plasma (PRP) injections has expanded significantly in the treatment of mild and moderate osteoarthritis (OA) over the recent years. The prevalence of hip osteoarthritis is on the rise due to factors such as an aging population and increased rates of obesity. As a result, this condition has generated significant socio-economic burdens. The purpose of this study is to evaluate the therapeutic efficacy and safety of autologous PRP injected with ultrasound-guidance in hip OA.

Methods: Twenty-two patients aged between 28 and 78 years affected with mild to moderate hip OA were included in the study. Each patient received a single injection of PRP. Exclusion criteria were previous hip surgery; rheumatic, infective, or immune system disorders. The patients were evaluated at baseline, 1, 6 and 12 months with the VAS and WOMAC score.

Results: Statistically significant reductions in VAS score were reported at 1 month, 6 months and 12 months ($P < 0.05$). Statistically significant reductions in WOMAC score were reported at 1 month and 6 months ($P < 0.05$). No side effects were noted.

Conclusion: This study supports the efficacy and safety of PRP injections for pain relief and improved function in patients with OA of the hip at 1 year follow-up.

Results: Statistically significant reductions in VAS score were reported at 1 month, 6 months and 12 months ($P < 0.05$). Statistically significant reductions in WOMAC score were reported at 1 month and 6 months ($P < 0.05$). No side effects were noted.

Conclusion: This study supports the efficacy and safety of PRP injections for pain relief and improved function in patients with OA of the hip at 1 year follow-up.

Keywords: PRP; ultrasound; hip

OP-09 THE EFFECT OF WHARTON JELLY DERIVED MESENCHYMAL STEM CELLS AND EXOSOMES FOR CARTILAGE REGENERATION AND COMBINATION WITH HYALURONIC ACID

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In this study, we wanted to compare regenerative effects of the MSCs-derived exosomes and Wharton jelly derived MSCs for cartilage defect and to evaluate whether the effects of hyaluronic acid which was combined with MSCs and exosomes and performing histological analysis in a rat model.

Methods and Materials: In this study, full thickness cartilage defects were created on the trochlear grooves of both distal femurs in 24 adult rats. The knees were randomly divided into six groups;

Group I:Control-saline,

Group II:Wharton's jelly mesenchymal stem cell (MSC),

Group III:Wharton's jelly mesenchymal stem cell-derived exosomes (EXO),

Group IV:Hyaluronic acid (HA),

Group V:MSC and HA combination

Group VI:EXO and HA combination.

A total of 3 intra-articular injections were given to each rat at one-week intervals, 4 weeks after the last injection, femurs were dissected for the evaluation. All groups were evaluated by the International Cartilage Repair Society (ICRS) macroscopic scoring system and the ICRS histological grading system by independent blinded observer with toluidine blue staining and type II collagen immunostaining

Results: Macroscopic evaluations revealed that ICRS scores of the MSC group (8.2 ± 0.7) were significant higher ($P < 0.05$) than control group (4.3 ± 0.7). The MSC and EXO had a higher repair rate and a smoother surface. The mean ICRS in the MSC, EXO, and HA groups were 8.2 ± 0.7 , 7.6 ± 0.9 and 5.6 ± 0.9 respectively. Two-way Anova analysis showed that ICRS score of MSC group were significantly higher than those in the control ($P < 0.001$), HA ($P < 0.0017$) and HA+MSC ($P < 0.0025$) groups and the score of the Exo group was greater than those in the control ($P < 0.0042$).

Conclusion: This study shows that the efficacy of exosomes in cartilage repair is as effective as stem cell therapies. However, no significant effect of adding hyaluronic acid to the use of stem cells and exosomes was found in the treatment of cartilage damage.

Keywords: Exosomes, mesenchymal stem cell, hyaluronic acid, cartilage

OP-10

COMPARISON OF THE EFFECTS OF DIFFERENT OSTEOTOMY METHODS ON UNION OF RAT FEMURS

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Objective: Osteotomy is a frequently used surgical procedure in orthopedics, such as trauma and deformity surgery. Different osteotomy methods may have effects such as infection and heat necrosis, and these factors may affect the bone healing process. In this study, radiological, histopathological and biomechanical effects on bone healing were evaluated after osteotomy (surgical saw, gigli wire, osteotomy after surgical drill) performed with different methods in the rat femur.

Materials and Methods: In this study, femoral osteotomy was performed on 54 Wistar-Albino male rats, 2,5 months old and weighing 250 grams, using three different methods, using a gigli wire, saw and drill+osteotome. They were divided into 3 groups as gigli group (group1, n:18), saw group (group2, n:18), and drill+osteotome group (group3, n:18). All groups were sacrificed on the 15th, 30th and 45th days and divided into 9 subgroups consisting of 6 rats to be evaluated radiologically, histopathologically and biomechanically. Animals were monitored in the cage with controlled temperature (23-25°C) and a 12:12 hour light/dark cycle. The scoring suggested by Lane and Sandhu was used for radiological evaluation, and the scoring recommended by Hue et al. for histopathological evaluation. Biomechanical evaluation was compared with the measurements (Newtons) made on the BESMAK BMT-E series material testing device (Besmak, Ankara, Turkey).

Results: No significant difference was observed between the 15th and 45th day radiological scoring distributions of the gigli, saw and drill+osteotome groups ($p=0.393, p=0.758$), but a significant difference was observed between the 30th day radiological scoring distributions ($p=0.001$). The disappearance of the fracture line was found to be higher in the drill+osteotome group than in the gigli and saw groups. No significant difference was observed between the histopathological values of the Gigli, saw and drill+osteotome groups at the 15th, 30th and 45th days ($p=0.719, p=0.097, p=0.352$). A significant difference was observed between the 30th day biomechanical values of the gigli, saw and drill+osteotome groups ($p=0.013$). The biomechanical values of the gigli group were found to be significantly lower than the biomechanical values of the saw and drill+osteotome groups ($p=0.026, p=0.006$). No significant difference was observed between the biomechanical values of the saw and drill+osteotome groups ($p=0.810$). No significant difference was observed between the biomechanical values of gigli, saw and drill+osteotome groups at 45th day ($p=0.773$)

Conclusion: Radiologically, better bone healing is provided in the early period after osteotomy with drill+osteotome. In addition, osteotomy with gigli wire is biomechanically weaker than osteotomy made with saw or drill+osteotome in the early period.

Keywords: Osteotomy, gigli wire, saw, osteotome

OP-11

PROXIMAL TIBIOFIBULAR JOINT STABILITY: TREATMENT OVER THE YEARS

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Traumatic proximal tibiofibular joint (PTFJ) can be an isolated injury or part of a bigger injury such as multi-ligament knee injury (MLKI). It is uncommon and the literature on its treatment consists mainly of case reports and limited case series. Non-operative treatment is often associated with persistent symptoms while surgery have improved outcomes but higher complication rates. Surgery ranged from arthrodesis, resection, repair to reconstruction. Concerns with ipsilateral ankle instability and need for implant removal had been reported. It can be challenging when PTFJ instability needs to be addressed during a posterolateral corner (PLC) reconstruction using a fibular fixation point. A technique that addresses such challenges is described with 2 case studies.

Results: The PTFJ is exposed via an anterolateral approach. The fibular head tunnel is reamed and threaded with two lengths of suture. The two free ends of each suture are anchored at the PTFJ anterior and posterior ligament tibia footprints accordingly. A concurrent PLC reconstruction can be carried out after this stage.

Conclusion: There is currently no consensus on operative treatment for traumatic PTFJ instability due to the limited literature. Though operative treatment is associated with potentially higher morbidity than conservative treatment, the outcomes are more predictable. The described technique utilizing suture anchors provide multi-planar stability, preserves the native anatomy, enables a concurrent PLC reconstruction with graft, obviates the need for hardware removal and the risk of tunnel collision in MLKI reconstruction.

Keywords: proximal tibiofibular joint, reconstruction, instability, multi-ligament

OP-12

FULKERSON OSTEOTOMY EFFECT ON KNEE JOINT POSITION SENSE, GAIT KINEMATICS, AND FUNCTIONAL LEVEL

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Objective: This study aimed to compare knee joint position sense, gait kinematics, and functional levels of individuals who underwent Fulkerson osteotomy surgery due to unilateral Outerbridge classification stage 3-4 chondromalacia patellae, followed by physical therapy and rehabilitation program, with individuals who only received physical therapy and rehabilitation.

Materials and Methods: The study included 20 patients who underwent Fulkerson osteotomy and 20 conservatively managed patients. Knee joint position sense was evaluated using the DrGoniometer® mobile application with active angle repetition method at target angles of 15°, 45°, and 60°. Gait kinematics were assessed using the Zebris FDM-T® device. Functional level was determined through single-leg hop, single-leg squat, and Kujala subjective knee evaluation form.

Results: When comparing gait kinematics of the affected sides between patients who underwent Fulkerson osteotomy and those who received conservative treatment (physical therapy and rehabilitation only), differences were observed in step length, cadence, stance phase percentage, and swing phase percentage ($p < 0.05$). In knee joint position sense of the affected sides at 60° target angle, patients who underwent Fulkerson osteotomy had significant improvement post-surgery ($p < 0.05$), whereas conservative management patients showed continued impairment both before and after treatment ($p < 0.05$). Kujala scores were significantly higher in the Fulkerson osteotomy group ($p < 0.05$).

Conclusion: Patients who underwent Fulkerson osteotomy showed superior knee joint position sense, gait kinematics, and functional level compared to those who received conservative treatment.

Keywords: Fulkerson osteotomy, chondromalacia patellae, functional level, gait kinematics

OP-13 A SIMPLE AND PRACTICAL METHOD TO DETERMINE AMOUNT OF ROTATION IN FEMORAL MIDSHAFT DEROTATIONAL OSTEOTOMY: GEOMETRIC ARC AND CHORD FORMULAS

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Background: Femoral derotational osteotomy surgery is a surgical intervention that involves the derotation of the femur at different sites to achieve the desired femoral anteversion angle. However, current intraoperative techniques to perform and measure the degree of correction are controversial, this can result in undesired degree of femoral version angle. In addition, until now there is no ideal method has been described to do so. Our idea is to reach the desired anteversion angle using arc and chord method preoperatively.

Methods: CT images of 20 femurs with excessive anteversion or retroversion deformities were retrospectively selected and three-dimensional (3D) geometric models were obtained. 15° of femoral anteversion were chosen as the target angle. Geometric arc and chord formulas were separately applied on axial CT images at the mid-point of the femurs to calculate the degree of correction. Then, virtual mid-shaft femoral derotational osteotomy was performed, then post-op femoral anteversion angle was measured.

Results: There was no statistical difference between the postoperative measured anteversion angles and the targeted angle in all examples. The arc and the chord lengths were not statistically different which indicates both formulas can be used to estimate the degree of correction.

Conclusion: Surgeons can practically estimate the degree of correction pre-operatively by applying either arc or chord formula on axial CT images which can help determinate the the degree of correction, without having the intraoperative measurements nor using any special equipment or unnecessary radiation dose.

Level of Evidence: Level III

OP-14 PROSPECTIVE STUDY ON AUTOLOGOUS ADIPOSE TISSUE-DERIVED STROMAL-VASCULAR FRACTION PLUS MICROFRACTURES VS. ISOLATED ADIPOSE SVF IN STAGE II-III GONARTHROSIS: CLINICAL AND RADIOLOGICAL OUTCOMES

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Background: Gonarthrosis, a degenerative and progressive disease, is a significant source of pain and disability which affect the quality of life. Current treatment modalities reduce symptoms and delay disease progression. Treatment of autologous adipose tissue-derived stromal-vascular fraction (SVF) has been shown to increase tissue regeneration and reduce inflammation. Microfracture, a surgical technique that creates fractures to stimulate cartilage repair, is another treatment option.

THIS STUDY AIMED:

1. Understanding the comparative effectiveness of isolated SVF versus SVF combined with microfractures in stage II-III gonarthrosis.
2. To prove that patients with gonarthrosis can lead a healthy life with their own cartilage by minimizing the need for knee replacement.

Methods: In a single tertiary referral center, a total of 40 patients aged between 41-69 years (28 female, 12 male) diagnosed with gonarthrosis (Kellgren-Lawrence Grade II-III) were randomly assigned into two treatment groups: Group A (control group) (n=20) receiving isolated SVF injections, and Group B (experimental group) (n=20) injections combined with microfractures.

Patients were evaluated one month, six months and a year post-treatment. Clinical assessments consisted of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Visual Analog Scale (VAS). To assess cartilage regeneration, x-ray, magnetic resonance imaging (MRI) were used.

Results: One month after the interventions, there were no significant difference between groups in terms of clinical assessment scores. At six-month follow-up, both groups improved from the baseline in all variables. Significantly better treatment results were found in the experimental group compared to control group. At six- and twelve-month follow-ups, patients in the experimental group scored better in all outcomes with a moderate effect size; in particular, better WOMAC scores were obtained at 12 months.

Conclusion: This preliminary study shows that SVF combined with microfractures compared to SVF only treatment modality in stage II-III gonarthrosis has better patient outcomes in terms of disease progression, pain and radioimaging.

Keywords: Intra-articular, Stromal Vascular Fraction, Microfracture, Grade II-III Gonarthrosis

OP-15 CLINICAL EFFICIENCY OF ARTHROSCOPY ASSISTED PRGF MEMBRANE TREATMENT FOR LARGE OSTEOCHONDRAL DEFECTS OF THE KNEE

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PRGF (Platelet-Rich Growth Factor) is a treatment that involves using a patient's own blood to concentrate platelets, which contain growth factors such as EGF, VEGF, ILGF, TGF- β , and PDGF. These growth factors are believed to promote angiogenesis, proliferation, tissue healing, and regeneration. PRGF, which is obtained by adding activators to PRP and autologous thrombin serum (ATS), has a membranous structure and can be shaped to fill defective chondral areas. In this study, we aimed to investigate the clinical effectiveness of PRGF mesh in the treatment of femur osteochondral defects in the knee joint. For this purpose, twenty-two consecutive adult patients who had no concomitant health conditions and had not undergone previous surgery on the same knee were included in this study. Patients with chondral lesions of 1.5 cm or greater were surgically treated with arthroscopic debridement and PRGF membrane application. All the procedures were done under anesthesia conditions. After arthroscopic debridement and concomitant intra-articular surgical procedures, the intra-articular fluid was drained and the PRGF membrane was placed in the defective area. After the surgery, the knee joint was immobilized for 36 hours and no weight bearing was allowed for 3 weeks. All patients received prophylactic antibiotics and intravenous single-dose 500 mg tranexamic acid before surgery. Intra-articular use of tranexamic acid was not administered to avoid affecting the course of the study. If necessary, tramadol was prescribed for pain control in the postoperative period. NSAIDs and antiplatelet drugs were avoided. Low molecular weight heparin was chosen for prophylactic anticoagulant therapy for 3 postoperative weeks. Physical rehabilitation was started in the 3rd postoperative week and continued for 4 weeks. All patients were followed up regularly at 3, 6, 12, and 24 weeks of surgery.

Results: Here, we are presenting the preliminary results of our pilot study. Twenty-two patients (100 %) were available for 6-month follow-up. Eighty-six percent of the patients were either satisfied or very satisfied with the overall outcome. Overall, patients showed significant improvements in the WOMAC, subjective IKDC, and Pain VAS. Due to the short follow-up duration, the return to sports disciplines could not be investigated but all cases returned to their daily activities. After achieving new ethical approval, T2 mapping for cartilage re/degeneration will be done, which has been proven to be a sensitive metric for evaluating early degeneration in articular cartilage.

Conclusion: PRGF seems to be effective for the treatment of large chondral defects in the knee joint. Sufficiently powered and well-documented clinical studies are needed to determine the full potential and thus therapeutic effects of PRGF, in the indication of cartilage defects. For our study, second-look arthroscopic evaluation and biopsy, if possible, from the newly formed areas will enlighten the real success of this treatment.

Keywords: Regenerative, Cartilage, PRP, PRGF, Autologous, Arthroscopic

OP-16 BILATERAL KNEE DISLOCATIONS WITH MULTILIGAMENT INJURIES: PRIMARY REPAIR OR RECONSTRUCTION?

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Background: Bilateral knee dislocations are rare and occur as a result of high-energy trauma. Knee dislocation involves complete disruption of the tibiofemoral joint. Knee dislocations can be associated with other injuries such as popliteal artery injury, peroneal nerve injury, intra-articular fractures, meniscal pathology, patellar ligament tears, and iliotibial tract injury. Studies suggest that surgical treatment is superior to conservative treatment in terms of long-term complications. The question arises: should we opt for primary repair or reconstruction surgically, and when is the best time to perform the procedure? Another option to consider is performing both primary repair and reconstruction in separate sessions. In this clinical case presentation, we explore the feasibility of primary repair in traumatic knee dislocations following damage control surgery.

Method: A 55-year-old male patient, H.G., was brought to our emergency department after falling from the second-floor balcony. He had a history of hypertension. Initial examination in the emergency department revealed the patient to be conscious, oriented, and cooperative with a Glasgow Coma Scale (GCS) score of 15. Both knees appeared deformed and swollen. There was approximately a 2 cm wound on the posterior aspect of the left knee with no active bleeding. Distal pulses (dorsalis pedis and posterior tibial) could not be palpated. Doppler ultrasound examination did not reveal blood flow. There were no neurological deficits. X-rays showed dislocation of both tibiofemoral joints, and closed reduction was performed (Figure 1). After reduction, distal pulses in the right lower extremity became palpable. Following computed tomography angiography, a preliminary diagnosis of left popliteal artery injury was made, and the patient underwent emergency surgery performed by the Cardiovascular Surgery team. Our team initially stabilized both knees using external fixators. Subsequent exploration by the Cardiovascular Surgery team revealed a popliteal artery injury, which was treated with embolectomy followed by repair using a saphenous vein graft. Circulation was restored, and then, on the 15th day after the incident, multiple ligament injuries in the right knee were repaired in the same session. Ruptures were identified in the medial collateral ligament (MCL), lateral collateral ligament (LCL), anterior cruciate ligament (ACL), posterior cruciate ligament (PCL), and posterolateral corner ligaments. Ruptured anterior and posterior cruciate ligaments were repaired with 5-mm anchors (Figure 3). In the same session, the medial and lateral collateral ligaments and popliteus tendon were also repaired with appropriate anchors. One week later, ligament repairs for the contralateral knee were performed, 21 days after the initial injury. In the postoperative early period, the patient was followed with locked braces in full extension for the first 2 weeks. Only isometric quadriceps strengthening and ankle range of motion exercises were prescribed. Over the next two weeks, brace angles were increased by 30°-60°-90°, and passive flexion-extension exercises were initiated. Bed-based strengthening and joint range of motion exercises were performed for the first 6 weeks. After the 6th week, active open-chain exercises with partial weight-bearing using crutches were initiated, and the crutches were discontinued at 2 months. The patient was given walking exercises as tolerated. Light to moderate-paced walking was introduced at 4 months, and high-intensity short-distance walking exercises were prescribed after 6 months.

Results: 12-month follow-up examination, the patient had a range of motion of 0-140° for the right knee and 0-130° for the left knee. The Lachman test was negative for the right knee and +1 for the left knee, while the pivot shift test was negative for both knees. Varus and valgus stress tests were also negative. The patient reported no difficulties with daily activities and exercises, with no feelings of instability in the knees. Tegner-Lysholm scoring scale was 85, that mean good results.

Conclusion: Initial assessment and intervention are crucial in the management of KD IV knee dislocations, which are highly rare. If there is any neurovascular injury, damage control surgery should be performed promptly, and definitive treatment should be planned for a later stage. While the literature often favors ligament reconstruction, it should be remembered that in suitable cases, MCL, LCL, ACL, PCL, and posterolateral corner injuries can be primarily repaired instead of reconstruction. Primary repair offers advantages such as not requiring grafts, allowing direct adjustment of ligament tension during open surgery, and avoiding the need for bone tunnels. In appropriate patients, primary repair may be the preferred option for knee dislocations, as it can stabilize all ligaments in the same session without the need for additional reconstruction surgeries.

PP-01 MAGNETICALLY ENHANCED ADIPOSE DERIVED STEM CELL CHONDROGENESIS

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Introduction: Magnetic nanomaterials, especially magnetic nanoparticles (MNP) are sought for applicability in biology and medicine. Regenerative medicine (RM) of musculoskeletal tissues could benefit the use of MNP as drug delivery tools, contrast agents for in vivo imaging or cellular-level mechanical stimulation using magneto mechanical actuation within magnetic field (MF). Human adipose derived stem cells (ADSC) are sought for RM due to large availability, however chondrogenic conversion can prove challenging.

Objectives: Proprietary as prepared Fe₃O₄ MNPs and MNP magneto liposomes containing ascorbic acid and dexamethasone were tested for size, stability, magnetic properties biocompatibility and chondrogenic effect on ADSC.

Material and Methods: MNPs were obtained by co precipitation, magneto liposomes were obtained from MNP, oleic acid or tocopherol, dexamethasone and ascorbic acid using a low energy (rapid injection in water) and high energy (ultrasonication)

method. Dynamic light scattering (DLS), FTIR and XRD were used to detect size and content characterization. MNP and magneto liposomes magnetization was determined by vibrating sample magnetometry (VSM). Cell viability, proliferation and chondrogenic activity were tested using MTT and spectrophotometric evaluation of GAG deposition in chondrogenic ADSC pellets.

Results: Magneto liposomes do not aggregate and are stable in solution up to 3 months presenting excellent magnetic reactivity. Good ADSC viability and proliferation was observed up to 21 days. A significant increased chondrogenic activity as expressed by GAG to DNA ratio was observed in ADSC -MNPs compared to non-loaded. MF exposure further increased ADSC chondrogenesis. Subcutaneous implantation of chondrogenic pellets in mice did not produce systemic or local inflammation. Histology revealed cartilage-like matrix deposition especially in magneto liposome treated ADSC pellets.

Conclusion: Magneto liposomes carrying bioactive molecules (ascorbic acid and dexamethasone) are stable, magnetic responsive and can improve chondrocyte proliferation in vitro and in vivo. Future studies are warranted to assess regenerative properties in animal models of cartilage defects.

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