MICROFRACTURE
VS.
OSTEOARTICULAR TRANSFER SYSTEM

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DISCLOSURE

Royalties

*Biomet Sports Medicine*

Board Member / Committees

AANA BOD
- MICROFRACTURE
  - FACILITATE REPAIR
  - MARROW STIMULATION
    - KNEE, SHOULDER,
    - ANKLE, HIP & ELBOW

- AUTOGENOUS OCT
  - TRANSFER FULL
    - TISSUE OC GRAFTS
      - KNEE, SHOULDER,
      - ANKLE & ELBOW
MFx PEARLS

- TECHNIQUE SPECIFIC
- REHAB SPECIFIC
- GOOD 1st OPTION
- BRIDGED - BURNED?

MINAS

- DURABILITY in ATHLETES

GOBBI / KREUZ
- Preop Counseling
- Debridement
- Perimeter Prep
- Ca++ Cartilage Removal
- Vertical Edge / Precise Perforations
- Postop Motion / Protection
“BETTER” MFx RESULTS

- YOUNGER PATIENTS (< 25 – 45 yrs)
- SMALLER FOCAL LESIONS (< 2 cm²)
- OPTIMAL ALIGNMENT (< 5° varus)
- LOWER IMPACT ATHLETES
- FAILURE INCREASES AT > 5 yrs
- LOWER BMI (< 30 kg / m²)
- GOOD DEFECT FILL (>66%)

Goyal, Arthroscopy, 2014
Mithoefer, AJSM, 2009
SYSTEMATIC REVIEW
MicroFracture Deteriorates?

- 48 AOT vs. 48 Microfracture Pts
- Avg Age 29.7 yrs vs. 32.5
- 1,2,3,and 5 yr FU
- KOS / SF-36 / Marx / IKDC
- **AOT** Significantly BETTER than MFx Over Time
- on Marx Activity Rating Scale Scores

*Krych, JBJS, 2012 Level 3 Retro Comparative Study*
MicroFracture Deteriorates?

- Longer term Study
- 53 Athletic Pts / Avg Age 38
- 10 yr FU
- Subj. / IKDC / Lys / Teg
- < 2.5 cm² Fail after 5yrs ( > 3 cm² at 1 year)
- Functional Decline Over Time

Gobbi, ICRS, 2012
KSSTA, 2005
TRABECULAR ARCHITECTURAL DISRUPTION

Fortier, J Knee Surg, 2012
MFx EVOLUTION

- 2 mm vs. **6 mm** DRILL HOLE DEPTH
- RABBIT MODEL
- LESS BONE OVERGROWTH / CYST
- IMPROVED TISSUE
- QUANTITY & QUALITY

*CHEN, AJSM, 2011*
MFx: 2.5 by 3mm
NFx: 1 by 6mm
Microdrilling: 1 by 6 - 9mm

Courtesy: J Bert,
Walsh: Univ. S. Wales, Australia, 2013
MFx AUGMENTATION

• IMPROVE SUPERCLOT CELL PROFILE
• IMPROVE SUPERCLOT STABILITY
• IMPROVE SUPERCLOT ADHESION
• MARROW AUGMENTATION SCAFFOLD STIMULATION
MFx AUGMENTATION

- SCAFFOLDS / CELL CARRIERS
  - ERGGELET

- GROWTH FACTORS
  - HAKIMI, GRANDE

- HYALURONIC ACID
  - STRAUSS

- BONE MARROW ASPIRATES
  - GOBBI, FORTIER

- MFx + Allograft powder + PRP
  - COLE
OAT: REPLACEMENT METHOD

HARVEST SITE CHOICES

SURFACE RESTORATION

GRAFT CONFIGURATION
HARVEST

1 – 2 GRAFTS : SCOPE

2 – 4: MINIARTHROTOMY
BACKFILL
REVERSED RECIPIENT SITE BONE
OR
BONE GRAFT SUBSTITUTES
INSERTION FORCE

MATTERS

800 N = 50 % REDUCTION

In CC VIABILITY

PATIL, AJSM, 2008
CONTOURING : CONGRUENCE
VERTICAL INDEX
TOPOGRAPHY
OF
RECIPIENT CONDYLE SITE
& DONOR TROCHLEA SITE

NISHIZAWA, AJSM, 2014
ANY RCT COMPARISON DATA? ......
AOT vs. MICROFRACTURE

- 28 OATs vs. 29 MFx / All Comp. Athletes
- Avg Age 24 yrs (15 – 40) / Mean F/U 37m
- Overall Success: HSS / ICRS / Xray

**OATs G to E: 96% vs. 52% for MFx**

- Functional RTS: **OATS 93%** vs. 52% MFx
- MRI Tissue Fill: **OATs 84%** vs. 49% for MFx
- 58% Biopsied at 1 yr / ICRS Tissue Asses.

**OATs G to E: 84% vs. 57% for MFx**

GUDAS, Arthroscopy, 2005
LEVEL I PRCT
AOT vs. MICROFRACTURE

- 34 AOT vs. 34 MFx vs. 34 Debridement Pts
- Avg Age 34 yrs / Mean F/U 36 mons
- Overall Success: IKDC / ICRS / Teg / Xray
- (S)IKDC: AOT Best \( (p = .024) \) vs. MFx & Debr \( (p=.018) \)
- Tegner Activity Outcome Best for AOT
- **MFx same as Debridement at 3 years**

GUDAS, Arthroscopy, 2013
Level I Prosp Randomized Comp Study
GOALS

✓ HYALINE CARTILAGE
✓ PRACTICAL / POS / ARTHROSCOPIC
✓ MINIMAL MORBIDITY
✓ COST EFFECTIVE
✓ SUCCESS – SHORT VS. LONG TERM

THANK YOU