## RÖKO INT 201

### Muskuloskeletal Imaging

RöKo International Donnerstag, 10.05.2018 von 8:30 bis 10:00 Uhr im Raum: Werner

**Zusatzinfo**
Kurs für Stufe Q1 - Basis-Qualifizierung in muskuloskelettaler Radiologie

**Vorsitz / Moderation:** Nebelung S / Aachen, Regier M / München

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**Referent(en):**
- Roemer F
- Emans P
- Behzadi C

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**Kurzzusammenfassung:** Cartilage damage is found in 63% of arthroscopic procedures. Cartilage defects are frequently encountered in the young patient (14-40 years of age). However, defects are often also found in the middle-aged patient (40-60 years of age). For adequate treatment, it is not only essential to have a good insight in the characteristics of the defect (e.g., chondral vs osteochondral, contained vs uncontained, shouldered vs unshouldered, etc.), but it is also paramount to have a good insight in the capacity of the joint to regenerate. This capacity depends on the interplay of both biomechanical and biological factors such as joint alignment and kinematics, duration of symptoms, preceding interventions, age of the patient, BMI, etc. In order to find proper solutions for these different cartilage defects, multiple products and procedures can be used. Currently, imaging is mostly used to define defect characteristics and detect potential concomitant joint damage. The use of imaging to design patient-specific instrumentation, design patient-specific implants, and evaluation of therapies is gaining popularity. This presentation will not only discuss different cartilage resurfacing strategies, but will also discuss the importance of imaging in decision making and accelerating the evaluation of upcoming repair strategies. A close collaboration between experts with different backgrounds is essential to bolster these developments in which aspects such as patient-specific treatments and prevention of further damage and osteoarthritis by earlier intervention play an increasing role.
Kurzzusammenfassung: Quantitative Magnetic Resonance Imaging (MRI) has become the focus of research in the field of musculoskeletal imaging. Several publications have doubtlessly demonstrated the valid information based on quantitative imaging. Early changes in cartilage composition can be detected by validated techniques such as dGEMRIC, T2, T2*, T1rho. Newer developments such as gagCEST imaging, sodium imaging, ultra-short echo times (UTE) applications, diffusion tensor imaging and quantitative susceptibility mapping have also demonstrated their capability of imaging articular cartilage. In a few recent studies, initial experiences at 7T MRI were presented demonstrating superior image quality with e.g. higher signal-to-noise-ratio and spatial resolution. In patients after cartilage repair surgery, detailed information on the quality of repair tissue might be detected with the use of high field systems including dedicated coils. However, several technical challenges associated with high-field imaging (e.g. SAR, creating homogeneous excitation and signal reception in larger field of views) have to be overcome in order to implement 7 Tesla scanners into clinical routine within the next decade. Apart from focusing on quantitative cartilage imaging, hybrid PET/MRI or SPECT/CT might serve as additional diagnostic tools presenting supplemental biochemical insights. For example, PET/MRI might demonstrate metabolic information such as active synovitis in patients suffering from OA leading to specific treatment.

In this presentation, promising new techniques in cartilage imaging such as the initial data on high field systems at 7T and PET/MRI-systems are presented. Furthermore, challenges in clinical implementation of theses research trends are highlighted.

Lernziele: - Insights into new developments and challenges on the field of cartilage imaging