

Controversies in treatment of early osteoarthritis of the knee

Osteoarthritis of the knee (knee OA) is a common disease with a relatively high prevalence and incidence among middle-old population and it is one of the main causes of walking-related disability in older adults. Early knee OA is an important issue nowadays since many younger patients struggle with the disabling effect of pain too and treatments are extremely varied. Such condition is characterized by cartilage loss, subchondral bone changes, synovial inflammation and meniscal degeneration. Notions about early OA changed greatly over the past few decades thanks to the use of MRI and ultrasound (allowing direct visualization of lesions and the early detection of pre-radiographic structural changes) and the widespread use of arthroscopy that permits direct visualization not only of the peri-articular bone but also of the cartilage, menisci, synovial membrane, ligaments and fat pad.

Even though symptomatic knee OA differs greatly in affected individuals, to rule out early knee OA is crucial to avoid or procrastinate at most the progression to a severe stage of the disease.

Most studies investigating knee OA are performed in older population and show that risk factors for its development are multifactorial. They include previous trauma, misalignments of the articulation, age, female gender, family history of OA, obesity and OA localization in another district (especially hand).

Identifying specific risk-factors in young patients with knee complaints could be of clinical importance and may help to distinguish high-risk patients for the development of knee OA. There are evidences that early OA is linked to anterior cruciate ligament (ACL) and/or meniscal lesions, great varus misalignment, significant tibial slope, high activity levels before history of knee complaints began and the presence of hand OA. Lesions of the menisci and ACL may disturb adequate mechanical loading in the tibia-femoral compartment (TFC). It is reported that also a non-anatomical replacement of the ACL can lead to more wear of a specific compartment. On the other hand patellar misalignment and higher BMI are crucial for the development of patello-femoral compartment (PFC). Nonetheless studies regarding early knee OA underline no differences of incidence between genders, probably because female participants in those papers are mostly pre-menopausal, in contrast to older and post-menopausal women in the other publications.

Young patients with early OA represent quite a serious challenge for orthopedists due to a combination of high functional demands and limited treatment options. Furthermore there is to add the willing of this young population of patients to stay active and avoid knee replacement. Conservative measures (injection, NSAIDs and/or physical therapy) can provide short-term pain relief but are only palliative in nature. On the other hand, surgical treatments are multiple and there is no consensus about them.

Meniscal repair, selective meniscectomy and ACL replacement (when disrupted) are crucial to mitigate pain and to improve ROM but they do not slow down the cartilage wear in knee OA.

Several authors suggest to perform osteotomies in active, physiologically young patients with symptomatic unicompartmental OA and misalignment. In contrast with arthroplasty, this procedure does not require permanent activity restriction and it can be performed in both varus and valgus misalignments depending on the kind of osteotomy chosen.

A tibial osteotomy is usually executed when a severe varus deformity is present with proximal tibial malrotation, while a distal femur osteotomy is typically chosen in the need of varus-producing surgery. Such procedures guarantee the preservation of the native joint, an easier adjustment of the tibial slope, avoid loosening of posterolateral structures and limb shortening. Nonunion and malunion, loss of correction are relatively frequent complications while a longer rehabilitation is always needed.

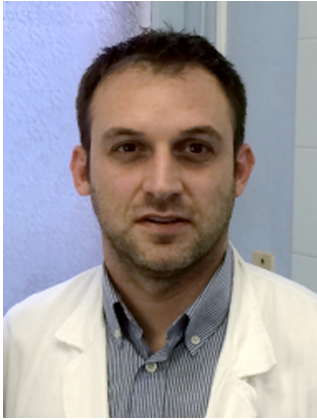
Other strategies are knee replacement procedures which are safe and effective, especially in older population. Younger patients (less than 40 years old) can only expect a 50% chance of good and excellent knee function scores and a revision rate of 12.5% at 8 years. Unicompartmental (UKA) and bicompartamental knee arthroplasty (BKA) have become a more convincing alternative treatment to TKA lately due to improved technique, prosthesis design enhancement and achievement of better clinical results. The rationale of a segmental resurfacing of the joint originates from the observation of the cartilage wear and the structural changes of the knee. Main advantages of UKA and BKA are to preservation of ligaments and minimal impact on bone stock. It allows fairly quick rehabilitation and short hospital stay. Revision, if required, is often carried out without

difficulties and performed with the utilization of primary implant.

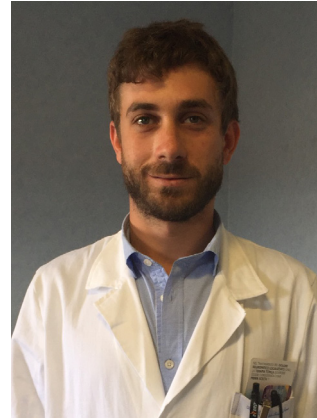
Nowadays the alternatives in treating an early knee OA cause great controversies in the scientific community. These chapters pretend to focus on such different strategies and investigate on advantages and disadvantages of them. The hope is that it may open the road to preventive or disease modifying therapies, thus preventing total knee replacement later in life.

To have a help to settle these controversies in early osteoarthritis treatment, we ask some of Italian best knee surgeons, also great friends, to participate to this literature review adding also their experience in the subject assigned.

We hope that this special issue can stimulate discussion and curiosity among the readers, and also the Authors, such as to improve our current surgical practice.



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