

ESSKA **European Osteotomy Consensus** The Painful Varus Knee

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This brochure is a summary of ESSKA European Osteotomy Consensus.

Full text is available on www.esska.org/page/projects

GRADING DESCRIPTION

- *Grade A: high scientific level*
- *Grade B: scientific presumption*
- *Grade C: low scientific level*
- *Grade D: expert opinion*

PRESIDENTIAL FOREWORD

There is great variation across Europe when it comes to medical praxis. Agreeing a common approach to pathologies or procedures has always been a challenge. But some such agreement is important, if we are to ensure standards.

For years now, one of ESSKA's objectives has been to work on professional standards. Thus, ESSKA has developed a strict and painstaking methodology which employs our considerable European expertise. We call it **ESSKA's European Consensus**.

Our first European Consensus was presented in 2016-2018 on Meniscus (Degenerative lesions and Traumatic tears). More information is available on www.esska.org.

This year, at ESSKA 2022 Paris Congress, we are delighted to launch the **ESSKA European Osteotomy Consensus**.

We thank Matt Dawson and Matthieu Ollivier-the Project leaders, our Consensus Project Advisor, Prof. Philippe Beaufils, as well as the members of the Steering, Rating, and Peer Review Groups for their efforts and dedication.

A special acknowledgement also for our staff, and particularly Mrs Anna Hansen Rak, without whom this would have been not possible.



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2020-2022



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CHAIRMEN FOREWORD

Osteotomy around the knee joint enjoys a unique identity in the armamentarium belonging to the surgeon treating degenerative disease.

This ESSKA formal consensus is strictly directed at the commonest current indication for major lower limb osteotomy which is for treatment of the painful degenerative varus knee. It also follows that whilst the greater number of osteotomies for this indication are performed in the proximal tibia alone it is imperative to understand that varus deformity should never be regarded as an issue singularly involving proximal tibial deformity.

This is not a consensus limited to high tibial osteotomy. Consideration of distal femoral osteotomy or double level surgery and the effect of intra-articular deformity is crucial to our understanding and our message. We believe the exciting propagations of osteotomy in advanced joint preservation work, be it slope alteration surgery, complex derotational osteotomy or finely tuned adjustments for the benefit of biological procedures fundamentally depend upon basic principles which must be learned and embedded. This consensus aims to collate and promote the clearest message currently available from scientific work and expert opinion.



Matt Dawson
Chairman (UK)



Matthieu Ollivier
Chairman (France)

INDICATIONS

Do extreme values of Body Mass Index (BMI) contraindicate KO?

BMI influences KO outcomes, with higher complication rates in patients with BMI>30 or BMI<21. Whilst no recommendation can be extracted from the literature on a specific 'cut off' value, a case by case assessment must be made if the BMI >35 and patients counselled regarding the high risks involved. *Grade C*

How does smoking of nicotine products influence decision to perform osteotomy?

Smoking and nonsmoking patients will all benefit from KO although smokers must be informed of the increased risks of complication such as infection and delayed union. *Grade B*

Smokers should stop nicotine abuse for at least three weeks before and three weeks after surgery. *Grade D*

Is early lateral compartment osteoarthritis (OA) a contraindication to KO?

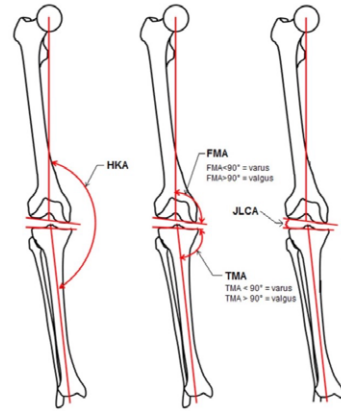
Early signs of OA (diagnosed by radiography, MRI or arthroscopy) do not impair outcomes and are therefore not contraindications to KO surgery although it is important to recognize the status of the lateral meniscus. KO is a potentially powerful intervention in the younger patient even with early lateral compartment disease.

Substantial lateral compartment OA (Kellgren Lawrence 3 and 4) is a relative contraindication to KO and may well impact upon final outcome. Positioning of the weight bearing line (WBL) into the lateral compartment in such a circumstances may accelerate lateral compartment disease. A more neutral positioning of WBL may therefore be a more viable alternative. *Grade D*

PLANNING

What are the normal values in lower-limb coronal alignment, femoral and tibial morphology?

Normal lower limb alignment and standard ranges can be defined according to Paley et al. 21 in the coronal plane. These normal values (table below) should be considered in the context of recognized ethnic and gender differences and clinical examination findings. *Grade B*

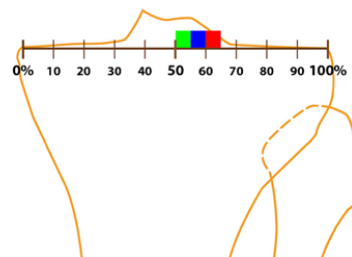


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|-------------|---------------------------------------|---|-------------------------|
| mTFA | Mechanical Tibio Femoral Angle | Acute angle between the mechanical axes of the femur and tibia | 1° to 1.3° varus |
| MPTA | Medial Proximal Tibial Angle | Medial angle between tibial mechanical axis and tibial plateau tangent | 87° (85° to 90°) |
| LDFA | Lateral Distal Femoral Angle | Lateral angle between mechanical femoral axis and femoral condylar tangent | 88° (85° to 90°) |
| JLCA | Joint Line Convergence Angle | Angle between the femoral condylar tangents and the tibial plateau tangents | 0-2° |

Where should the weightbearing line be positioned to treat a knee with medial OA knee in varus malalignment?

An individualized approach is recommended which recognizes that each patient has differing characteristics which include degree of deformity, radiographic osteoarthritis severity and indication for osteotomy surgery.

No specific target point can be recommended but based on historic results target ranges of between 50% and 68% have been proposed and may be implemented depending on patient specificity and degree of OA. In the light of the more recent evidence relating to joint line obliquity the consensus group would aim at the lower range of correction (see the following statement). *Grade D*



Three target zones proposed for valgus osteotomy by Feucht et al¹⁹. Indications for osteotomy (such as medial overload, cartilage repair, medial meniscal transplantation, ligamentous insufficiency) without any OA in the green zone 50%-55%, mild OA to the blue zone 55%-60% and moderate to severe OA is targeted at the red zone 60%-65%.

Which knee joint line orientation is acceptable after planning an osteotomy?

The knee joint line orientation defined as the position of the knee joint tangent relative to the horizontal is known to be important to reduce shear forces in the knee. Joint line orientation reflects a challenging compromise between mechanical WBL modification and resulting tibial and femoral anatomical morphology. Planning should therefore aim to target a resulting knee joint line orientation below or equal to 5° (mPTA <95). *Grade B*

When is a double level osteotomy (DLO) indicated to correct a varus malaligned knee?

A DLO correcting the varus malalignment in both the femur and the tibia should be considered if deformity analysis identifies a significant deformity in both bones. DLO may also be considered if when planning a single level correction, the resultant knee joint line orientation exceeds 5° or MPTA exceeds 94. *Grade C*

When correcting a varus arthritic knee how is intra-articular deformity factored into the plan?

Additional ligament laxity and intra-articular deformity increasing the varus deformity can be measured using the joint line convergence angle (JLCA) according to Paley et al. JLCA >2 is considered abnormal and should be accounted for in overall alignment planning to prevent bony overcorrection. The degree to which this abnormality will reverse following bony correction and upon resumption of weight-bearing varies between individual cases. Various pre-operative and intra-operative methods preventing bony overcorrection in abnormal JLCA cases. *Grade C*

COMPLICATION

What is the management of hinge fractures diagnosed post-operatively?

Undisplaced type 1 hinge fractures may be managed by standard rehabilitation but undisplaced type 2 and 3 fractures should not be exposed to early post-operative full weight-bearing especially if no additional fixation or gap filling has been applied. Displacement of any hinge fracture on either of minimum two radiographic projections post operatively should be considered for operative intervention. If the displacement is considered minor an altered rehabilitation regime will be necessary until the osteotomy has united or considered stable. *Grade C*

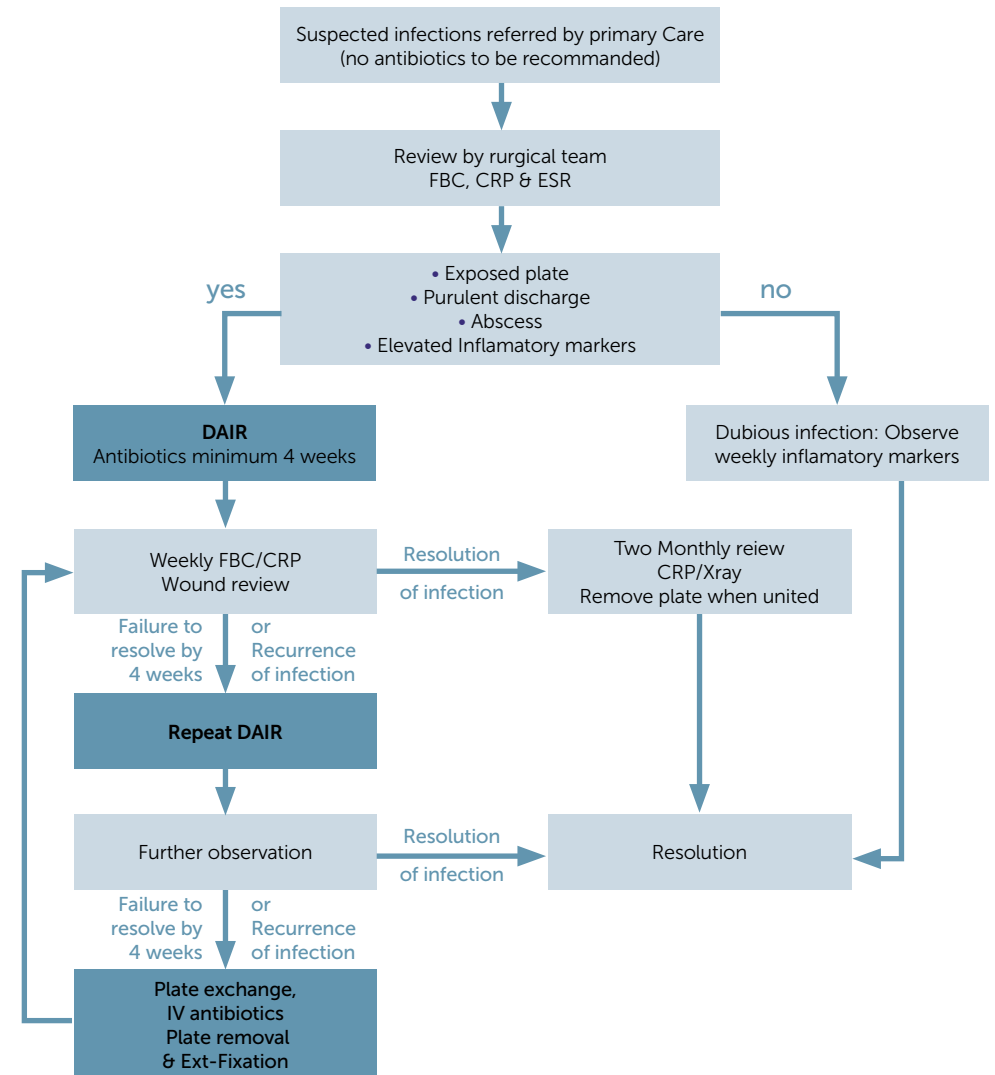
How is infection diagnosed and treated in MOWHTO?

No diagnostic criteria exist to distinguish between superficial and deep infection which is specific to osteotomy. Because MOWHTO does not involve muscular or fascial coverage of the implant any suspected osteotomy infection must be regarded as potentially requiring surgical intervention because of the proximity of the implant to the skin surface. The steering group recommends that antibiotics are not commenced prior to review by the surgical team. It is suggested the following algorithm is used for diagnosis and treatment of infection. *Grade C*

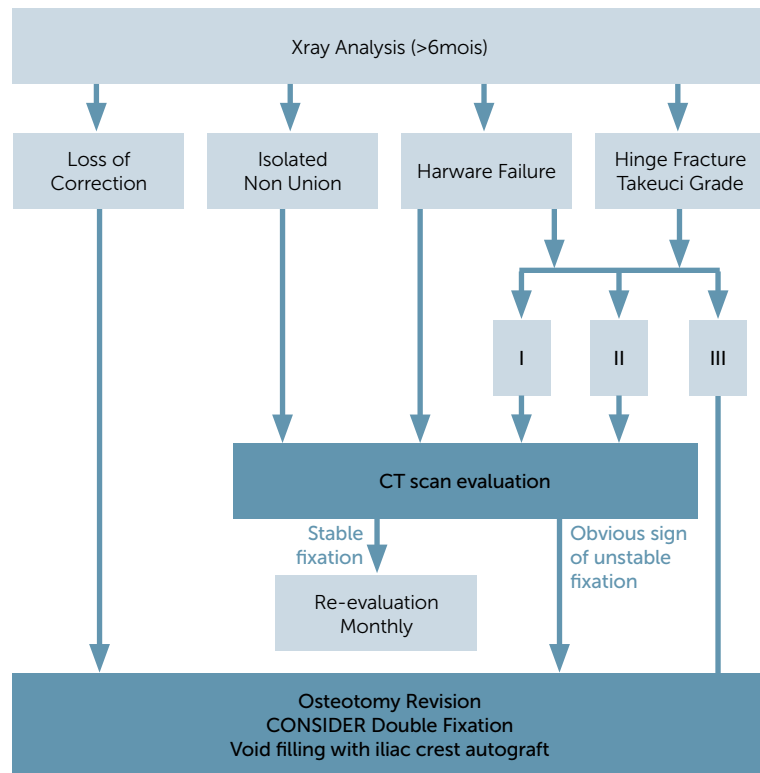
How is aseptic non-union diagnosed and treated after osteotomy?

Aseptic non-union is a rare complication of MOWHTO even when performed without void filler. It is essential to combine clinical assessment with the radiological findings on a case-by-case basis. Obvious mechanical factors including loss of correction, hardware failure or lateral hinge fracture may confirm the diagnosis and should direct surgical management. Close clinical follow up is essential and CT scan may be helpful. We suggest the following algorithm for the diagnosis and treatment of aseptic non-union in MOWHTO. *Grade C*

ALGORITHM FOR SUSPECTED INFECTION IN HTO



ALGORITHM FOR NON-UNION IN HTO



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