Reply to letter to the editor on: Boomerang proximal tibial osteotomy for the treatment of severe varus gonarthrosis

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We thank the authors of the letter for their remarks on our study [1]. They have a few queries to add weight to the argument so that we think the following should be clarified.

1. Most of the literature considers HTO as a procedure for unicompartmental involvement?

Bauer has shown that closed wedge high tibial osteotomy should be limited to varus osteoarthritis Ahlbäck grade III without radiographic evidence of arthrosis in the lateral compartment [2]. This has made a powerful statement that proximal tibial osteotomy could only yield a satisfactory result in varus gonarthrosis with medial compartment involvement. However, Keen and Dyreby demonstrated that the results of valgus osteotomy for treating varus gonarthrosis did not depend on the compartmental involvement, but on adequate valgus alignment. The knee with adequate valgus alignment had better clinical results than that with varus alignment, despite bi- or tricompartmental involvement [3]. The belief in HTO as a procedure for unicompartmental involvement may be true for laterally-based closing wedge osteotomy, which has limitations in correcting and maintaining alignment. One should not extrapolate this to other types of proximal tibial osteotomy. The currently used closing wedge high tibial osteotomy cannot treat severe varus osteoarthritic knee because it cannot create and maintain valgus alignment until the osteotomy heals. Wagner et al. [4] and Maquet [5] showed

that even in osteoarthritic knee with severe varus deformities and lateral compartmental involvement, satisfactory results could be obtained if adequate valgus alignment had been created and maintained. Neither of them used the laterally-based, closing wedge osteotomy but used their own techniques. Maquet used barrel-vault supratubercle osteotomy and Wagner used infratubercle displacement osteotomy.

2. Flexion contracture cannot be corrected without releasing capsuloligamentous structures?

Flexion contracture in grade IV & V varus gonarthrosis is not a real soft-tissue contracture but flexion deficit owing to increased posterior tilt of proximal tibia [6]. One can observe that the knee with flexion contracture has a hard end point while extending. This implies that the upper end of the tibial plateau bumps against the femoral condyle before reaching full extension. In addition, to correct flexion contracture during total knee replacement, not only soft tissues release but the distal femoral cut must be increased. With boomerang osteotomy a flexion contracture of not more than 20 degrees can be corrected.

3. It is really difficult to displace the proximal fragment laterally without removing the osteophytes and soft tissues release?

The correction of varus alignment and flexion contracture can be performed without removing osteophytes or releasing MCL, by the lever-arm technique. A small osteotome is inserted into the distal fragment acting as a lever, pressing the proximal fragment posteriorly and distal fragment ventrally. This allows the anterior spike of the proximal fragment to be pushed into the distal fragment. Subsequently, the distal fragment is displaced laterally and ventrally. With this

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technique severe varus deformity and flexion contracture of not more than 20 degrees can generally be corrected.

4. Severe gonarthrosis with bone loss on both medial and lateral sides with lateral subluxation of tibia if treated with osteotomy will definitely remain in varus and unstable?

In the event of instability, after the valgus alignment has been restored the soft-tissues of the medial and lateral compartments can spontaneously contract if a valgus brace is used for three to four months after surgery [4].

5. Mere correction of alignment will not relieve the pain, as all three compartments are diseased and unstable?

The boomerang osteotomy can treat varus gonarthrosis with medial and lateral compartment involvement. In cases of associated symptomatic patellofemoral arthrosis, Pridie drilling/microfracture or spongiolisation [7] combined with lateral release is performed. In the published article the associated symptomatic patellofemoral arthroses were not included in the study.

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