Coronal Malalignment is Infrequently Present in Patients with Aseptic Tibial Loosening

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INTRODUCTION:

Coronal lower extremity malalignment and improper implant position have been described as risk factors for aseptic tibial loosening following primary total knee arthroplasty (TKA). However, several prior studies have shown no association between alignment and implant loosening. Meanwhile, there is increasing interest in kinematic alignment. Therefore, we sought to determine the incidence of coronal malalignment of the limb and tibial component in patients that were revised secondary to aseptic tibial loosening.

METHODS:

A cohort of 73 patients that were revised for aseptic tibial loosening was identified. Patient demographics were recorded. Radiographs from the primary procedure (preoperative and postoperative) were reviewed to determine the index coronal alignment of the knee and tibial component. Adequate alignment was noted if limb alignment was in neutral or appropriate vaglus alignment and tibial implant position was within 3 degrees of the neutral mechanical axis.

RESULTS:

Only four (5.5%) patients had varus alignment of the tibial component >3 degrees. Therefore, 69/73 (94.5%) patients had well-aligned tibial implants. The average coronal alignment of the limb was 3 degrees of valgus and only six (8.2%) patients had coronal varus limb alignment (all >0 degrees anatomic varus).

DISCUSSION AND CONCLUSION: Limb and tibial implant malalignment were infrequently seen in patients revised secondary to aseptic tibial loosening. Most patients fell within previously described “safe” alignment parameters (<3 varus for the tibial component and neutral or valgus limb alignment). Specifically, malalignment was only present in approximately six to eight percent of patients. Therefore, factors other than alignment appear to contribute most to the development of aseptic tibial loosening.

Table 1. Patient Demographics

Age (years) (Range)	60 ± 8.2 (46—79)
Gender (%female)	68.4
BMI (kg/m^2) (Range)	34.2 ± 6.3 (21.4—50.0)
BMI > 40 kg/m^2, n (%)	14 (19%)

Table 2. Outliers

Varus amPTA outlier, n (%)	6 (8.2%)
Varus tibial component >3°, n (%)	4 (5.5%)

Table 3. Preoperative Radiographs

aFTA (mean, range)	0.2° varus (15° varus – 11° valgus)
amPTA (mean, range)	3.8° varus (11° varus – 2° valgus)
aLDFA (mean, range)	6.3° valgus (2° valgus – 10° valgus)

Table 4. Postoperative Radiographs

aFTA (mean, range)	2.7° valgus (5° varus – 9° valgus)
amPTA (mean, range)	1° varus (6° varus – 3° valgus)
aLDFA (mean, range)	4.5° valgus (1° valgus – 8° valgus)