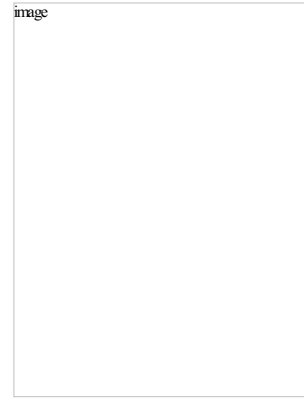


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Varus Knee

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LESS VALGUS ALIGNMENT IN TOTAL KNEE ARTHRITIS FOR THE VARUS KNEE

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INTRODUCTION

Restoration of knee alignment remains one of the mainstays of total knee arthroplasty (TKA). Per classic alignment, a neutral mechanical axis should pass from the center of femoral head through the center of the knee joint line to the center of the ankle. Constitutional knee varus, however, is a well-recognized variant in both males and females as reported in radiographic analyses¹. In these cases, the mechanical axis falls slightly into the medial compartment. In recent years, some studies have questioned whether strict and routine mechanical knee alignment in TKA may pose some problems related to ligament imbalance that could explain the high rate of disappointed patients, almost 20% in some reports^{1,2}.

The normal femorotibial angle (FTA)¹¹ is slightly more valgus in women than men. In general, the normal knee joint alignment is 2°–3° of varus compared with the mechanical axis in radiographic studies in healthy non-arthritic patients^{3-4,11-14}. Obesity, activity, and muscle strength all play a crucial role in the development of arthritis even with a well aligned knee^{2,15,16,21}.

Normal TKA alignment is a relative concept; thus two separate ideas of alignment have evolved in the technical execution of the operation: component alignment and limb alignment. Both may strictly interact with each other and may result in the same limb alignment but create different knee kinematics, motion and clinical results⁵. Over correction of a constitutionally varus knee to a predetermined mechanical alignment may result in undesirable kinematic consequences if the femoral and tibial components are positioned that misalign the patient's anatomic tibiofemoral and patellofemoral axis. Additional soft tissue release may be required to accomplish this.

Alternative bony resection techniques have been described in order to improve knee function and pain control, while minimizing the need for ligament balancing^{5-7,9,19}. Less valgus knee alignment for the varus knee in TKA is not a new concept as evidenced by the concept of anatomic alignment through a measured resection technique described by Hungerford and Krackow⁹. The purpose of this technique is to position the femoral and tibial component in order to anatomically recreate the joint line with the overall component alignment at 2°–3° of varus in relation to the mechanical axis of the lower limb⁹. This angle may be achieved with a 2°–3° of varus angulation of the tibial cut in the varus knee. Ultimately, the purpose of this alignment is to provide for a joint line that is parallel to the ground during normal gait.

Despite acceptable mechanical alignment, a significant portion of the patients undergoing primary TKA (15–20%)^{3,4} remain unsatisfied with their result. In this study, the authors hypothesized that utilizing more anatomic, measured resection technique in the varus knee would produce outcomes similar to those achieved with a traditional mechanical alignment technique. The approach is based on the patients' unique anatomy adjusting for worn cartilage or bone loss. In the varus knee, the tibia cut is made according to the patients' native anatomy adjusting for worn cartilage and bone loss, and applying an anatomic amount of tibial slope.

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