



## Limited Kinematic Alignment in Total Knee Replacement

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It's well accepted mechanical neutral alignment for TKR, have most survivorship for aseptic loosening of components. KINEMATIC ALIGNMENT introduced by Dr Howell recently challenged this concept, accordingly many modifications made regarding this method, while the best short-term results may achieve with computerized or robotic limited kinematic alignment.

While our shortages for computerized navigation manifest in our region, many of our colleagues used limited kinematic method with jig based conventional instruments. but my main concern is for severe deformed knee joints which has difficulty for surgeon to balance knee after cutting made with conventional jig-based methods in total knee replacement. The other issue is stiffness and less range of movement after realign knee to neutral which may cause of lateral distillation.

My prospect is if I take in consideration overall clinical alignment of knee and manage accordingly, I will have more normal knee after total knee replacement.

I had known if I make cut rely on clinical deformity, I can achieve near normal knee conformity and less Release may need during total knee replacement.

I designed a technique for cutting with conventional instruments, which has freedom for change in angle of distal and rotation cut of femoral components and can change freely for frontal and slope for tibial cut.

After visiting the patient, I evaluate overall clinical alignment of knee, any thrust, and laxity of collaterals. I consider valgus angle between 2 to 7 degree according to overall alignment.

Logically higher angle for higher varus. Three joint (hip-knee-ankle) is not mandatory for this method, but I prefer to take that for showing alignment correction. I choose cruciate retaining

system as far as I had to use PCL substitute system (inflammatory disease).

In the operation after ordinary arthrotomy, which I use classically subverts, cut the distal femur with intramedullary guide in 6-7 degree for obvious varus alignment, 4-5 for neutral, 2-3 for valgus knees. The thickness of cuts checked with angle wing guide.

Then make tibial cut parallel to distal femur with tensioner with 6-7 degrees slope, and align femoral posterior condylar cut with tibial cut, almost always adjust with 1-degree external rotation of component. Hazards of excessive angles, more than 3 degrees for tibial varus and more than 7 degrees for distal femur valgus angle. In this step I'm going for ligaments balance, almost always we don't need any release, if medial (for varus knees) or lateral (for valgus knees) seems to be tight, be careful about release because overall clinical knee alignment goes to valgus or varus unexpectedly.

40 patients (60 knees) included in this method. Patella Arthroplasty was done for 40 cases. The thickness of cuts were no more than 8 millimeters in femur and 9 millimeters in tibia. No need for extensive release of MCL, LCL, PCL. At the end of procedure, I gained a balance knee in extension and flexion with patellar excellent tracking. Most overall limb alignment, clinically and radiographically were in neutral.

Radiographs alignment were about 90% in (0 to 3 degrees of varus).

woman Knee score have been improved significantly after surgery.

No early component failure or dislocation and aseptic loosening in two years following up.

Although the final results in X-ray maybe scary for some surgeon but This is the reasonable and considerable method for countries (such our country) with restricted feasibility instruments for gaining near kinematic alignment, in order of more range of motion and less painful total knee replacement while still it is stable.

It cannot be done with a system which has fixed external rotation in component.

Some degree of Tibial component varus-maintained ligaments and alignment in total knee replacement and give pain free range of motion.