

# INTRAOPERATIVE MORPHOMETRIC MEASUREMENT OF DISTAL FEMUR DIMENSIONS AND CORRELATION WITH IMPLANT SIZING IN FEMALE TOTAL KNEE ARTHROPLASTY PATIENTS

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## INTRODUCTION:

Accurate implant sizing is one of the major determinants in defining the success of total knee arthroplasty. With regards to sizing, implant mismatch tends to be more evident in the female population. This study was designed to evaluate the distal femur dimensions of female patients who underwent TKA in our institution and to compare them with the current prosthetic system in use.

## METHODS:

Total of 101 female patients (105 knees) who underwent TKA were recruited in this study. Intraoperatively, the AP dimensions (medial and lateral condyles) and mediolateral (ML) width were measured. Known dimension of the femoral component of the prosthetic knee system currently in use were compared with the morphological data.

## RESULTS:

The average femoral component overhang was 2.11mm (SD 3.94mm). There was significant difference between the mean ML width of the resected femur and the femoral component ( $p < 0.01$ ). Analysis also revealed a significant positive and weak relationship between both, AP (medial and lateral) and ML dimension. The aspect ratio for the morphological data showed a larger ratio for smaller knees and inversely a smaller ratio for larger knees (Figure 1). Although the aspect ratio of the morphological data were generally smaller than the implant aspect ratio, the trend of change in the aspect ratios of the initial five sizes of implant were seen to follow the morphological data. However, the larger implant sizes showed little change in its aspect ratio. In other words, the implant ML overhang is expected to be more pronounced in the larger knees.

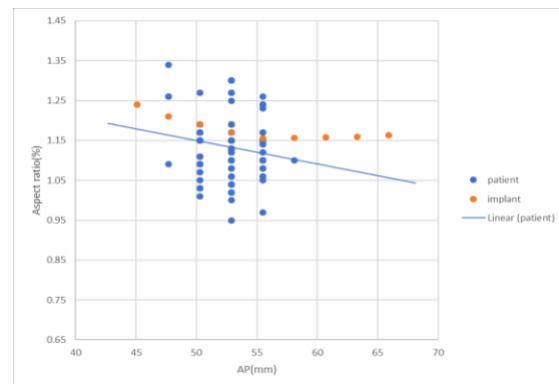


Figure 3: The femoral aspect ratio (ML/AP) versus the anterior-posterior (A/P) measurements for 105 female knees in comparison with the currently used implant

## DISCUSSIONS:

The knees of our population are seen to be even narrower than the Thais(1) and Koreans(2). As we compare our results with a Korean study(2) which used a similar method of measurement, it was noted that our population had a narrower distal femur as reflected by the smaller aspect ratio seen in our study. Thus, in general, for any given implant size, our population is at a greater risk of ML overhang. This justifies the need for specifically tailored implant design with a smaller ML width for a given AP length to suit the morphology of our population.

## CONCLUSION:

The findings of this study justifies the need for specifically tailored implant design with a smaller ML width for a given AP length to suit the morphology of our population thus curbing the problem of ML overhang.

## REFERENCES:

1. Wanitcharoenporn W et. al. J Med Assoc Thai. 2014;97(12):1308-13.
2. Ha CW, Na SE. JBJS Br. 2012;94(5): 638-41.