Digital Templating Software (MyAnkle™) For Total Ankle Replacement

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INTRODUCTION:
The aim of this study is to develop semi-automated method for templating total ankle implant size in digital form. The software system named (MyAnkle™) has been designed and the template image library was created based on Hintegra total ankle replacement template. This software is evaluated by testing the accuracy and interobserver reliability of pre-operative digital templating of tibia and talar component.

MATERIALS & METHODS:
The digital radiographs of twelve patients underwent primary total ankle arthroplasty from year January 2014 until April 2017 in Universiti Kebangsaan Malaysia Medical Center (UKMMC) were retrospectively reviewed. The digital templating was done by two foot and ankle surgeons from different centre using digital templating software (MyAnkle™). The accuracy was assessed by comparing the predicted implant size with the actual components selected at the time of surgery and is measured in percentage(%). The interobserver reliability was assessed using the linear weighted kappa(κ) analysis.

RESULTS:
The first surgeon accurately predicted similar implant size in 83.3% tibia component and 91.7% talar component. The accuracy for second surgeon was 58.3% for tibia component size and 66.7% for talar component size. The interobserver reliability for tibial and talar component size was substantial, weighted kappa (κ)= 0.802 (95% CI, 0.623 to 0.982), $p<0.001$.

DISCUSSIONS:
Pre-operative planning in joint replacement surgery is important for the surgeon to plan the levels of bony resection, anticipate size of implant and the appropriate instruments needed.

Figure 1: Digital templating for tibial and talar component. The implant can be rotated to accommodate the ankle deformity.

Figure 2: Total ankle replacement implant (Hintegra)

intraoperatively.[1] MyAnkle™ has auto-scaling properties that matches the radiographic magnification and acetate template magnification. Templating process will be faster and the risk of surgical error that arises from radiographic magnification error is eliminated.

CONCLUSION:
MyAnkle™ software is a promising tool for preoperative planning in total ankle replacement surgery.

REFERENCES:
1. Levine B, Fabi D, Deirmengian C. Digital templating in primary total hip and knee arthroplasty. *Orthopedics* 2010; 33(11).