Introduction:
Renewed interest in UKA necessitates further investigation into the ramifications of conversion to TKA due to either implant failure or progressive joint disease. The purpose of this study was to compare the depth of tibial resection at UKA and the resulting implications for conversion to TKA using two different UKA techniques and implant designs.

Materials and Methods:
A radiographic review of 52 UKA’s from a single surgeon was performed. Sixteen cases utilized a standard all-polyethylene tibial onlay UKA marketed as a minimally invasive resurfacing implant using manual instruments. Another 10 cases were from patients implanted with a metal backed mobile bearing onlay design also using manual instruments. Finally, 26 cases used a tibial inlay implant design implanted with a novel robotically assisted technique. Measurement techniques were developed using TruamaCad 2.0 (Orthocrat Ltd) to determine the depth of medial tibial plateau resection at initial UKA as well as potential tibial cuts and implant components required at conversion.

Results:
Average depth of bony medial plateau resection was significantly greater in the standard technique onlay design groups (8.5 ± 2.3 mm for the all poly onlay and 14.8 ± 2.2mm for the mobile bearing onlay) compared to the robotically assisted inlay group (4.4 ± 0.9 mm) (p<.0001). At conversion to a standard TKA, the proposed tibial osteotomy would require medial augmentation/revision components in 75% of the all poly onlay group and 80% of the mobile bearing onlay group as compared to 4% of the robotically assisted inlay group (p<.0001).

Conclusions:
Robotically assisted UKA using a tibial inlay design appears to be a truly resurfacing procedure with respect to the tibia, resulting in significantly less tibial bone resection at UKA as well as simpler conversion to TKA when compared to conventional onlay techniques.