Paper #113

Utility of 3D Printed Models in the Treatment of Femoroacetabular Impingement

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Summary:
To determine the effect that preoperative use of 3D printed models has on the outcomes for femoroacetabular impingement (FAI) surgery.

Abstract:

Purpose

To determine the effect that preoperative use of 3D printed models has on the outcomes for femoroacetabular impingement (FAI) surgery.

Methods

Ninety patients that underwent FAI surgeries by the same surgeon were retrospectively analyzed. Patients were age- and sex-matched for two groups - those who had pre-operative 3D printed hip models (n=45) and those with conventional planning using X-rays and/or CT scan (n=45) were identified. Radiographic parameters on pre- and post-operative radiographs that include the alpha angle (45 Dunn view), center edge angle (CEA) (weight bearing AP pelvis), and head-neck offset ratio (cross table lateral) were obtained. Clinical outcomes were assessed by analyzing iHOT and HOS scores pre- and post-operatively.

Results

Ninety patients (3D printed group 45, Conventional group 45) with a mean age of 36 years were evaluated. Mean follow-up time was 28 months. For all of the radiological variables (CEA and alpha angle), there was a significant improvement seen for both groups (p=0.001). However, the 3D printed group showed significantly better resection of bone to a normal alpha angle (<55) than did the Conventional group. Additionally, head-neck offset was significantly better in the 3D printed group (p=0.001). Statistically significant improvements were seen in both groups on the HOS and iHOT-33 (p=0.001).

Conclusion

Planning FAI surgery using 3D hip models helps in achieving better resection, especially in CAM-type FAI.