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Innovation in Education

Poster Title

The Use of 3-Dimensional Printing in Orthopaedic Resident Education: Adolescent Transitional Ankle Fractures

Authors

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Abstract

Objective

The purpose of this study was to evaluate the ability of 3D printing to improve orthopaedic resident learning. The study hypothesis was that the use of 3D printed models as part of a comprehensive educational program would result in improved resident confidence and performance treating transitional ankle fractures in adolescents.

Methods

16 orthopaedic residents were randomized to either study or control groups. Each participant took a self-assessment test designed to evaluate knowledge of transitional ankle fractures. Evaluation of self-confidence in treating these injuries was done using a 5-point Likert scale for 6 questions. Residents were then given the opportunity to attend lectures, read a textbook and review CT images. The study group additionally manually manipulated 3D-printed models of triplane fractures. All participants re-took the self-assessment and performed reduction and fixation of a sawbones triplane fracture model. Completed sawbones models were graded by 3 orthopaedists. Paired t-tests were used to determine between-groups differences for performance on written and practical assessments and Likert responses.

Results

Both groups demonstrated significant improvement in testing scores following the educational session ($p < 0.01$). There were trends toward greater improvement in testing scores and higher sawbones score for the study group, although these did not achieve statistical significance. Only residents in the study group demonstrated statistically significant increases in Likert scores ($p < 0.05$).

Conclusion

The use of 3D printed models of pediatric transitional ankle fractures as part of a teaching module for orthopaedic residents resulted in significant improvements in self-reported confidence managing these complex injuries. By enhancing resident education in this fashion, 3D printing may ultimately result in improvements in the safety, quality and value of care provided to patients with triplane fractures.

References

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