3D PRINTING FOR PREOPERATIVE PLANNING IN TIBIAL PLATEAU FRACTURES. A CASE SERIES

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INTRODUCTION:

The development in Orthopedic field is moving concurrently with the advancement of the available technologies for diagnostic imaging. Hence, with 3D printing (3DP) technology, surgeons could plan ahead, moving from the virtual world to the physical one.

MATERIALS & METHODS:

A case series of patients who had tibial plateau fractures were selected. The first step in the generation of a patient-specific model is extracting the reconstructed 3D CT images of the fractures. This image segmentation process partitions an image area or volume into non-overlapping, connected regions, homogeneous with respect to certain characteristics. The main objective is to reduce the complexity of the original image, leaving a comprehensive representation of the characteristics of interest.

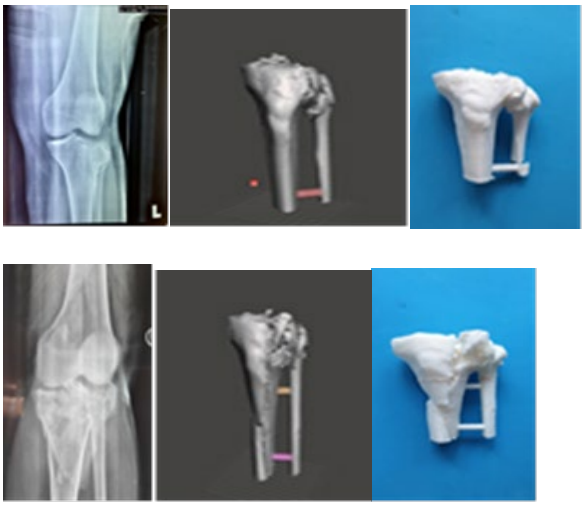

Figure 1: Left: Plain radiograph. Center: Digital modelling. Right: 3D printed model

DISCUSSIONS:

Preoperative Planning and 3D Printing often come together. For example, in a joint replacement, the surgeon can print an anatomical model replica of the joint to explore the possible obstacles and plan accordingly. In trauma cases, the use of 3D printed replicas of bone fractures is very useful for surgeons and researchers to test methods before the surgery even begins. These guides can be used intraoperatively for taking precise bone cuts. This process decreases the surgical time and has widespread implications for the patient, the surgeon, and the hospital.

CONCLUSION:

Examples of the application of 3DP within the orthopedic field have spread rapidly in the last few years and include the use of a 3DP model to assess the surgical approach for corrective osteotomies, in order to gain a more informative overview of the anatomy and to improve the detail of planning, especially in cases of minimally-invasive surgery.

REFERENCES:

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