3D MODELLING FOR PREOPERATIVE PLANNING IN ORTHOPAEDIC TRAUMA: SEREMBAN EXPERIENCE ON VARIOUS BONES

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INTRODUCTION:

3D printing is a rapidly emerging manufacturing process whereby a 3-dimensional object is built directly from a computer-aided design model. These advantages have been readily recognized in orthopedic surgery where it has been used for various applications.

MATERIALS & METHODS:

A case series done at HTJ Seremban analyzed the fracture patterns of the aforementioned fractures preoperatively. Similar to how patients presenting with fractures across a joint, computed tomography (CT) scans of the fractures were obtained. Segmentation of the CT scans was performed, and this partitions an image area into homogeneous, connected regions, with respect to the CT scan.

DISCUSSIONS:

3D printing is an important tool for preoperative planning. Nowadays trauma cases are very challenging as accidents always involve high impacts resulting in severely comminuted fractures. In trauma cases, the use of 3D printed replicas of fractures is useful for surgeons to have an idea of the fractures with direct visualization before the surgery. These guides can be used intraoperatively for taking precise bone cuts, decreases surgical time and has widespread implications for the patient, the surgeon and hospital.

Figure 1 Left: CT images, Centre: 3D model, Right : Digital image

Figure 2: Digital printing of acetabulum, scapula and calcaneum

CONCLUSION:

The use of physical models for treatment planning and visualization has several distinct advantages. Within the orthopedic and traumatology field, 3D printing also enables advance testing of the surgical procedure. This possibility can lead to a better intervention and a reduction of operation time. 3D-printed models can be a useful tool for the teaching and training of novice surgeons, improving the quality of training and learning.

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