Patient-Specific three-dimensional printing models for planning the human shoulder orthopedic surgeries

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Abstract:

The human shoulder is a stable, complex and multi-functional anatomical joint within the human body. Its remarkable range of motion for abduction/adduction, rotation, and movements within the sagittal plane makes this important joint susceptive to several types of dislocations. While diagnosis usually starts with scanning techniques such as MRI/CT, three-dimensional printing could provide more detailed information about the patient for personalised treatment. In this study, after the MRI data was captured, the Bio-CAD image-based modelling technique [1] was used, using ScanIP software, and the anatomical structures were manufactured for pre-surgery planning using Fused Deposition Modelling (FDM) and Stereolithography (SLA). Besides this, the finite element model was developed to assess stability in different conditions. The use of three-dimensional (3D) printed models can aid in effective pre-operative planning, for example for analysing the shoulder dislocations, rotator cuff tears [2], or for any other pre-planned treatments. This helps to design detailed surgeries, improve the diagnosis, therapeutic strategies, and increase the awareness of the patients.

Biography:

Aysha Saeed is studying at the University of Exeter, College of Medicine and Health. She is currently in her final

year of BSc Medical Sciences.

Publication of speakers:

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