

DEVELOPING A 3D PRINTED PATIENT-SPECIFIC CAST FOR A FRACTURED WRIST FROM CT SCAN DATA

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ABSTRACT

Hand fractures are a common cause of injury for the athletic and general population. However, it has been observed in several instances that, the traditional plaster casts are responsible for causing skin and soft tissue infection. The conventional plasters are itchy, uncomfortable and are considered to be ineffective heat repellents. Thus, the need of the hour today is, to overcome these limitations by providing an alternate solution for the masses, which is deemed acceptable as per the medical standards. A 3-D printed cast made out of Poly-lactic acid (PLA), which is manufactured using the Material extrusion technique, is the plausible solution. This paper provides a methodology to design the cast using the patient's distinctive geometric features. The aforesaid cast has been modelled using the specific hand geometry, which was obtained from that particular patient's CT- Scan data using open-source software. The objective behind using the 3-D printing technique is to develop a precise final product, which is patient-friendly and light-weight. The entire process revolves around the 'best fit geometry'. This paper aims to find an accurate, quick and effective 3-D printed cast solution.

KEYWORDS: CT-Scan; DICOM File; Poly-Lactic Acid; Material Extrusion & 3-D Printing

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