



Using 3D printing for pre-planning of High Tibial Osteotomy

Hamidreza Mosleh

Iran University of Medical Sciences, Iran

Abstract:

Recent developments in 3D printing have gave orthopedic surgeons among a novel technology that has the ability to revolutionize preoperative planning. The appearance of 3D printing technology enables the digital preoperative plan and simulation to move from the virtual phase to the reality phase. Varum disorders are recurrent lower limb malformations associated with many anatomical changes in the knee joint and adjacent segment. High Tibial osteotomy is one of the best treatment options in genuvarus deformity. In this randomized clinical trial study, 16 patients with genuvarum were selected that divided between the 2 groups (main study and the control group). A standing alignment radiograph were taken from all patients to measure mMPTA, mL DFA, CA and mFTA. CT scan was taken from 8 patients in the main study group. Mimics software was used to build the 3D model. Then, we had to prepare the model made for printing by a 3D printer. Finally, the printed 3D model is provided to the orthopedic surgeon. So, the surgeon operated on half of the patients with the help of a printed 3D model. Orthoped performed an osteotomy on the printed model that was exactly the same as the actual surgery After the surgery, we once again took radiography (all patients) and a CT scan (main study group). The aim is to see if the angles have been corrected after surgery. Finally, a comparison was made between these two surgical procedures. Results showed that the printed 3D model group had lower: 1. cost of hospitalization and anesthesia, 2. duration of surgery, 3. fluoroscopic dose and 4. bleeding. Also, angles had better correction in model group. These angles sizes on the model were very similar to that on the

radiography which approve the reliability of these models. So, using 3d model have lots of benefits. Orthoped can use that for preplanning of surgery and finally it has many fine outcomes for patients.

Biography

Hamidreza Mosleh has 24 years old and he is a MSc student of Anatomical sciences at Iran university of medical sciences. His research interests include anthropology and radiology in anatomy.

Publication of speakers

1. Hamidreza Mosleh et al ; Automation, machine learning, and artificial intelligence in echocardiography: A brave new world, 2018 Sep 2
2. Hamidreza Mosleh et al ; Superplasticity of Ti-6Al-4V Titanium Alloy: Microstructure Evolution and Constitutive Modelling , 2019 May 2
3. Hamidreza Mosleh et al ; Comprehensive methodology for commissioning modern 3D-image-based treatment planning systems for high dose rate gynaecological brachytherapy: A review, 2020 Sep 2

Citation: Hamidreza Mosleh; Using 3D printing for pre-planning of High Tibial Osteotomy ; 3D Printing 2021; May 21; Paris, France.