

# CRC7: Designing and Fabrication of Highly Precise Robotic Arm With 3D Printing Technology for a Congenitally Missing Patient's Hand - A Clinical Case

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**Introduction:** Bionic arm is a prosthesis which will allow the amputees to control it with their own brain instead of depending on the mechanical functions of the artificial limbs which are moreover available in the market. A complex design of controlled systems is embedded in the bionic arm which will analyse and receive the signals from the brain, which converts the electrical energy into mechanical energy, making the bionic arm move.

**Case Description:** A 10 year old boy came to the dental office with congenitally missing right hand and needs to replace it prosthetically. This case study describes the complete fabrication of missing arm by CT scan obtained from contralateral hand of the patient, and printing it with an light weight material in which the required motors and sensors are attached into that, where it is directly connected to the microprocessor and the electrodes from this processor are placed on the surface of the chest muscles.

**Discussion:** To control the prosthetic hand, brain sends signal through motor nerves, electrodes will receive those signals and transmits it to the microprocessor, which controls the prosthetic hand according to patient's perception. Ultimately more commands can be programmed into the robotic prosthesis, making it more functional since the signals are detected from spinal motor neurons.

**Conclusion:** The overall concept of fabricating the highly precise robotic hand prosthesis is to make it economical; still there are other manufacturers who fabricate the robotic prosthesis, which is quite expensive. In this fabrication, only the required datas which are obtained from the patient is 3D designed and printed, which makes the complete fabrication economical for the patient to accept and improve their quality of life.

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