

Frame based to Frameless Stereotactic Neuro-Surgery

Gaurav Bhutani, T A Dwarakanath, Ali Asgar, D Venkatesh

Abstract

Stereotactic surgery is a technique used for diagnosis and treatment of brain tumors. This paper gives survey on evaluation of art and science of neuro-surgery and proposes the need of stereotaxy to replace the outmoded conventional surgery. Stereotaxy makes use of a system of three-dimensional coordinates to locate a site (usually within the brain) with high precision for conducting biopsy or surgery. The evolution of frame to frameless stereotaxy till its current form has been explained. The paper gives a detailed account of how the imaging and image processing software has complimented the advances in neuro-navigation based stereotactic surgery. The important contributions and developments in the past and the current practices in the area of neuro-navigation and registration techniques have been presented in this paper. The development in the author's laboratory on robotics based stereotactic surgery has been discussed.

Keywords: Frame and Frameless Stereotaxy, Neuro-Navigation, Robots for Surgery

Gaurav Bhutani (Corresponding Author)
DRHR, Bhabha Atomic Research Centre, Mumbai 400085, Email: bhutani@barc.gov.in

T A Dwarakanath
DRHR, Bhabha Atomic Research Centre, Mumbai 400085, Email: tad@barc.gov.in

Ali Asgar
ACTREC, Kharghar, Mumbai 400208, Email: aliasgar.moiyadi@gmail.com

D Venkatesh
DRHR, Bhabha Atomic Research Centre, Mumbai 400085, Email: dvenkat@barc.gov.in