

Brief Note on Image Guided Neurosurgery

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Description

Image-guided stereotactic neurosurgery has developed into a field that every neurosurgeon should know as the concept of "minimally invasive surgery" is supported by maximum practicing surgeons. Although image-guidance allows surgeons to maintain the "straightforward pathway", there's adding substantiation that the use of this method offers several other advantages. The number of neurosurgeons practicing image-guided methods is growing quickly.

Image-guided surgery is used to plan and perform minimally invasive procedures like removing a brain tumor or performing a brain biopsy. The movement of the instrument inside the brain with millimeter delicacy can be traced on the monitor during the neuronavigation procedure and help to avoid critical areas and surrounding healthy tissue to maximum extent.

Image-guided brain and spine surgery can make neurosurgical procedures more effective, minimize the size of the exposure and the invasiveness of the surgery, allow an approach through the least eloquent path, define resection boundaries that may not be apparent to the surgeon's eye, optimize placement of hardware in spinal surgery, and drop the manipulation of nervous tissue outside the pathological process in both cranial and spinal cases. Therefore, it isn't surprising to feature image-guided neurosurgery being used by the majority of neurosurgeons and considered the "standard of care". Every cranial procedure must be performed with the utmost precision, which is a fundamental feature of neurosurgery. Unlike every other organ in the body, the brain is structured primarily into structures that perform specialized and irreplaceable activities. Damage to these structures as a result of the surgical pursuit of a deep target results in unavoidable and unjustifiable

neurological impairments. Furthermore, the exterior appearance of the brain gives no indication of the function subserved within, posing a severe task to neurosurgeons in achieving intraoperative localization.

Neurosurgeons have benefited from a wide range of options when it comes to brain imaging. Computed Tomography (CT), followed by Magnetic Resonance Imaging (MRI), has most recently provided detailed 3-D images to guide cranial procedures. The computer has become a new instrument in the operating room because all recent advances of new imaging technologies are based on the use of computers. Therefore, an alternate name for the field could be computer-assisted surgery, although this appellation stresses the means over the benefits of this method. As minimally invasive procedures are more hugely adopted, there will be lower chance for conventional orientation during surgery and a higher reliance on guiding technology and its essential complexity.

The name image-guided surgery implies the coupling of some form of imaging to the surgical act and is the first essential element of similar procedures. It's important to note that the term image-guided surgery is at best a misnomer. Surgeons aren't necessarily guided by images themselves, but rather by the information contained therein. Thus, a more applicable term for the field would be information-guided therapy, acknowledging not only the role of information but also the fact that numerous therapies that would profit from such a coupling aren't surgical in nature. Because these methods can be used extensively with any invasive therapy that produces local effects with minimum collateral damage and benefits of this procedure includes low threat of surgical errors and increase in surgical confidence and reduce operating, hospitalization and recovery time.