A study on the tridimensional distribution of somatosensory evoked responses in human thalamus to aid the placement of stimulating electrodes for treatment of pain.

**Giorgi C, Kelly PJ, Eaton DC, Guiot G, Derome P.**

PMID: 7008522 [PubMed - indexed for MEDLINE]
Three-dimensional processing of a stereotactic brain atlas.

Giorgi C, Gartibotto G, Garozzo S, Micca G, Piretta G.

PMID: 7036877 [PubMed - indexed for MEDLINE]
Digital image processing to handle neuroanatomical information and neurophysiological data.

Giorgi C, Cerchiari U, Broggi G, Birk P, Struppeler A.

An application of computer graphics technology to functional stereotactic neurosurgery is presented. Neuroanatomical images derived from a stereotactic atlas and information retrieved from a neurophysiological data base are drawn on a graphic monitor. The pictures are oriented and scaled according to appropriate landmarks. The aim of this work is to add confidence in the surgeon's selection of the probe trajectory and to improve the knowledge of sensory and motor organization within the thalamus.

PMID: 3915653 [PubMed - indexed for MEDLINE]
An intraoperative interactive method to monitor stereotactic functional procedures.


Division of Neurosurgery, Istituto Neurologico, Milano, Italy.

A computer graphic technique is presented, which makes it possible to handle neurophysiological and neuroanatomical data collected during functional stereotactic procedures.

PMID: 3314371 [PubMed - indexed for MEDLINE]
3-D reconstruction of cerebral angiography in stereotactic neurosurgery.

Giorgi C, Cerchiari U, Broggi G, Passerini A.

Division of Neurosurgery, Istituto Neurologico, Milano, Italy.

A method is described, that enables the surgeon to appreciate the three-dimensional distribution of cerebral vessels within the stereotactic space.

PMID: 3314374 [PubMed - indexed for MEDLINE]
Three-dimensional reconstruction of neuroradiological data within a stereotactic frame of reference for surgery of visible targets.

Giorgi C, Ongania E, Franzin A, Broggi G.

Division of Neurosurgery, Istituto Neurologico C. Besta, Milan, Italy.

Three-dimensional information obtained with neuroradiological exams performed under stereotactic conditions is displayed on a surgical console within the graphic reconstruction of the geometry of stereotactic frames. Planning of convenient probe trajectories can be carried out taking into account all data derived from different diagnostic techniques.

PMID: 3329887 [PubMed - indexed for MEDLINE]


Neurologische Klinik, Technische Universität, München, Federal Republic of Germany.

A three-dimensional map was created by a computer-assisted analysis of functional and somatotopic organization of the target area in the human ventrolateral thalamus. Stimulation in the target area mostly elicited increased tone in skeletal muscles, with a concomitant decrease or stop of tremor. Despite averaging of all responses, no clear somatotopic organization could be demonstrated for the tonifying stimulation effects. In addition, somatosensory-evoked potentials were recorded, indicating an afferent projection to the target area.

PMID: 3478984 [PubMed - indexed for MEDLINE]
Computer assisted analysis of neuroradiological data in planning neurosurgical procedures.

Giorgi C, Broggi G, Casolino D, Franzini A, Pluchino F.

Division of Neurosurgery, Istituto Neurologico C. Besta, Milano, Italy.

A surgical graphic console is presented. It allows the display of multimodal images (CT, MR and digital angiography), and the identification of tridimensional outlines of structures of surgical relevance, within a surgical reference system, together with the trajectory of surgical approach.

PMID: 2674349 [PubMed - indexed for MEDLINE]
Computer-assisted planning of stereotactic neurosurgical procedures.

Giorgi C, Casolino SD, Franzini A, Servello D, Passerini A, Broggi G, Pluchino F.

Department of Neurosurgery, Istituto Neurologico C. Besta, Milan, Italy.

To extend the advantages of stereotactic localization to open procedures, a computational device with a graphic output is introduced. It is designed to be used in the operating room, where it processes neuroradiological information (CT, MR, and angiography) acquired under stereotactic conditions. The surgeon can interact with neuroanatomical data, extracting borders of structures of surgical relevance. The resulting sets of outlines, shown tridimensionally within the reference of a stereotactic head holder, are presented with respect to the planned approaching trajectory. Color-coded high-resolution graphics show the relationship between lesions and normal brain structures and guide the surgeon's access to deep-seated lesions through small exposures.

PMID: 2680080 [PubMed - indexed for MEDLINE]
Guided microsurgery by computer-assisted three-dimensional analysis of neuroanatomical data stereotactically acquired.

Giorgi C, Casolino DS, Ongania E, Franzini A, Broggi G, Pluchino F.

Neurosurgical Division, Istituto Nazionale Neurologico C. Besta, Milano, Italy.

Stereotactic acquisition of neuroradiological data, followed by identification of cerebral structures and three-dimensional rendering, has been successfully applied to guided microsurgical resection of deep-seated cerebral lesions. The method described utilizes data from magnetic resonance, computed tomography, and digital angiography and allows the surgeon to 'wire frame' the lesion volume and the position of cerebral vessels and structures of high functional relevance. Three-dimensional rendering of surgical instrumentation around the reconstructed anatomy allows for planning and simulation of the trajectory of approach.

PMID: 2080372 [PubMed - indexed for MEDLINE]
Deep seated cerebral lesion removal, guided by volumetric rendering of morphological data, stereotactically acquired clinical results and technical considerations.

Giorgi C, Ongania E, Casolino SD, Riva D, Cella G, Franzini A, Broggi G.

Department of Neurosurgery, Istituto Neurologico C. Besta, Milano, Italy.

The theoretical advantages of microsurgery guided by volumetric reconstruction of anatomy in stereotactic space, compared to traditional technique are discussed. Preliminary clinical results in 30 cases and technical considerations, concerning future developments, are presented.

PMID: 1792959 [PubMed - indexed for MEDLINE]

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Stereotactic craniotomy. [Neurosurg Clin N Am. 1990]


Guided microsurgery by computer-assisted three-dimensional analysis of neuroanatomical data stereotactically acquired. [Stereotact Funct Neurosurg. 1990]

Interactive image-guided resection of cerebral cavernous malformations. [Comput Aided Surg. 1997]


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Contemporary stereotactic atlases: merging of functional data with individual morphological MRI acquisitions.

Giorgi C, Cerchiari U.

Department of Neurosurgery, Ist. Naz dei Tumori, Milano, Italy.

The traditional concept of the stereotactic brain atlas, utilized as an anatomical piece of information, to be integrated with neuroradiological data in order to organize functional observations, is evolving towards the creation of a powerful database for clinical and functional data, contained in anatomical structures. Actual computational resources make it possible to use this information, interactively adapted to each patient's anatomy, and updated, following each procedure.

PMID: 1792972 [PubMed - indexed for MEDLINE]
A computer controlled stereotactic arm: virtual reality in neurosurgical procedures.

Giorgi C, Luzzara M, Casolino DS, Ongania E.

Istituto Neurologico C. Besta, Milano, Italy.

A computer controlled mechanical arm for stereotaxy is presented. It has 5 free joints and can be attached to a stereotactic frame. High precision digital encoders register the angular position of each joint and the computer determines the position of the tip of the instrument in the stereotactic space. Accuracy and usefulness are discussed.

PMID: 8109308 [PubMed - indexed for MEDLINE]
Imaging techniques and computers.

**Giorgi C.**

Division of Neurosurgery, Istituto Nazionale Neurologico C. Besta, Milano, Italy.

Imaging technology has been the pacesetter of stereotactic technique since its introduction in clinical practice. Quite recently, the extraordinary quality of diagnostic neuroimages and the growing availability of computing power has widened the field of applications of stereotaxy suggesting, at the same time, substantial evolution of its instrumentation. Fusion of multimodal digital images, integration of morphological and functional data, and dimensional rendering techniques have become powerful 'navigational aids' for tissue sampling, functional procedures and image-guided endoscopic surgery. Radiosurgical dose planning systems integrated with image processing and computer graphics routines allow efficient interactive evaluation of tissue-dose volumes superimposition in brachytherapy and external beam focused irradiation. Volumetric guided open surgery, assisted by intraoperative acquisition of stereotactic echographic and microscopic images, allows satisfactory treatment of deep-seated cerebral lesions. Further improvement is to be expected with the implementation of the ongoing development of localizing solutions totally integrated with the microsurgical instrumentation.

PMID: 7624656 [PubMed - indexed for MEDLINE]
A computer assisted toolholder to guide surgery in stereotactic space.

Giorgi C, Pluchino F, Luzzara M, Ongania E, Casolino DS.

Department of Neurosurgery, Istituto Nazionale Neurologico C. Besta, Milano, Italy.

A computer assisted toolholder, integrated with an anatomical graphic 3-D rendering programme, is presented. Stereotactic neuroanatomical images are acquired, and the same reference system is employed to represent the position of the toolholder on the monitor. The surgeon can check the orientation of different approach trajectories, moving the toolholder in a situation of virtual reality. Angular values expressed by high precision encoders on the five joints of the toolholder modify "on line" the representation of the configuration of the toolholder within the three dimensional representation of the patient's anatomy.

PMID: 7771222 [PubMed - indexed for MEDLINE]

Giorgi C, Riva D.

Department of Neurosurgery, Istituto Nazionale Neurologico C. Besta, Milan, Italy.

Five children with supratentorial intraventricular midline cerebral tumors were operated on using a stereotactically guided transfrontal approach. Assisted by a three-dimensional graphic reconstruction of cerebral anatomy, the surgeon was able to reach and remove the lesion with minimal damage to healthy parenchyma. Neurosurgical and neuropsychological evaluation of the results suggests that this surgical approach is a valid alternative to the transcaldosal route. This image-based intraoperative guidance is as effective as landmark-oriented surgery, which requires section of the corpus callosum, possibly leading to neuropsychological deficits, particularly in the pediatric age group.

PMID: 8057144 [PubMed - indexed for MEDLINE]
Intraoperative fusion of field images with CT/MRI data by means of a stereotactic mechanical arm.

Giorgi C.

Istituto Nazionale Neurologico C. Besta, Milano, Italy.

In this paper we describe a neurosurgical articulated arm used as a pointer and as a support for intraoperative image acquisition, integrated with a graphic 3-D rendering system. The patient’s anatomy is volumetrically displayed, from stereotactically acquired CT, MRI, and DSA images; the head holder is the common reference system for image reconstruction and for the calibration of the surgical arm. Arm orientation in stereotatic space is displayed, together with the surgical arm. Arm orientation in stereotatic space is displayed, together with the volumetric reconstruction of cerebral lesions and surrounding healthy tissue. The arm, equipped with failsafe electromagnetic brakes, can be employed to support imaging sources such as an endoscope, an echographic probe, or a CCD camera, whose images can be stereotactically integrated with preoperative data in performing minimally invasive neurosurgical procedures.

PMID: 7882076 [PubMed - indexed for MEDLINE]
Robot-assisted microscope for neurosurgery.

Giorgi C, Eisenberg H, Costi G, Gallo E, Garibotto G, Casolino DS.

Division of Neurosurgery, University of Maryland Medical System, Baltimore 21201, USA.

We describe the implementation of a robotic arm connected to a neurosurgical operative microscope. A force feedback sensor drives the motors of the arm in response to the positioning of the microscope by the surgeon. Computer graphic techniques allow tracking of the current position of the microscope within the volumetric reconstruction of the brain. The integration of the prototype into the neurosurgical operating room is currently being evaluated. Preliminary comments on this experimental phase are offered.

PMID: 9079441 [PubMed - indexed for MEDLINE]
Preliminary clinical experience with intraoperative stereotactic ultrasound imaging.

Giorgi C, Casolino DS.

Stereotactic and Functional Neurosurgery, Istituto Nazionale Neurologico, Milano, Italy. cgiorgi@galactica.it

Neurosurgery guided by intraoperative ultrasound imaging is presented. The method is based on a stereotactic handfree ultrasound imaging device, designed to monitor cerebral shifts and lesion volume modifications during surgery. Preoperative CT and MR, acquired within a reference system, merge with ultrasound images stereotactically obtained by means of a lockable articulated encoded support. Landmarks from the lesion and surrounding structures are identified prior to opening of the dura and used during surgery to monitor volume changes.

PMID: 9711696 [PubMed - indexed for MEDLINE]
The multifarious use of stereotactic instrumentation.

Giorgi C, Riva D.

Stereotactic and Functional Neurosurgery, Istituto Nazionale Neurologico C. Besta, Milan, Italy.

PMID: 9660115 [PubMed - indexed for MEDLINE]
ERROR: undefined
OFFENDING COMMAND: get

STACK:

/quit
-dictionary-
-mark-
The neurodevelopmental price of survival in children with malignant brain tumours.

Riva D, Giorgi C.

Developmental Neurology Division, Istituto Nazionale Neurologico C. Besta, Via Celoria, 11, 20133 Milan, Italy. driva@istituto-besta.it

Increasing survival rates in malignant brain tumors treatment have directed attention to the side effects of long-term disease control. Nevertheless, although the treatment protocols are continuously remodelled, the quality of life of children surviving for a long time is still poor. The most severe sequelae are neurocognitive disorders, which are associated with neurobehavioural alterations. The last are partly derived directly from the lesion localisation and treatments, but are often reinforced by academic and social failure. The deleterious effect of radiotherapy (CRT) is very well documented and confirmed in all the studies. The radiation dose delivered according to the age has reduced, but not fully eliminated, the negative influence on mental functioning. Also the CRT hyperfractionation has reduced, but not cancelled, this cognitive negative impact. Intrathecal methotrexate per se is responsible for a severe cognitive impairment, which can be even more severe in association to CRT. Some surgical approaches have been responsible for postoperative behavioural disturbances. Serial neuropsychological and behavioural evaluations, which should also include the survivors' own perception of their quality of life, are badly needed. The results of these evaluations should be covariate with several factors (age, type of surgery, lesion site, hydrocephalus, complementary therapies) in an attempt to define interdisciplinary treatment protocols to maximise survival while minimising cognitive/behavioural deficits.

PMID: 11151727 [PubMed - indexed for MEDLINE]
Robot-assisted microscope for neurosurgery. System with a navigating microscope: a retrospective analysis of 208 cases.


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