



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

Approved by AICTE & Affiliated to Anna University
Accredited by NBA & Accredited by NAAC with 'A+' Grade,
Recognized by UGC saravanampatti (post), Coimbatore-641035.



Department of Biomedical Engineering

Course Name: Radiological Equipment
III Year : V Semester

TITLE: STEREOTAXIC RADIOGRAPHY



STEREOTAXIC RADIOGRAPHY

Stereotactic radiography is a very precise form of therapeutic radiation that can be used to treat abnormalities in the brain and spine, including cancer, epilepsy, trigeminal neuralgia and arteriovenous malformations. The term “stereotactic” refers to the use of a three-dimensional coordinate system combined with an imaging technique, such as computed tomography (CT) scanning or magnetic resonance imaging (MRI), to precisely locate targets deep within the brain.



STEREOTAXIC SURGERY





PROCEDURE

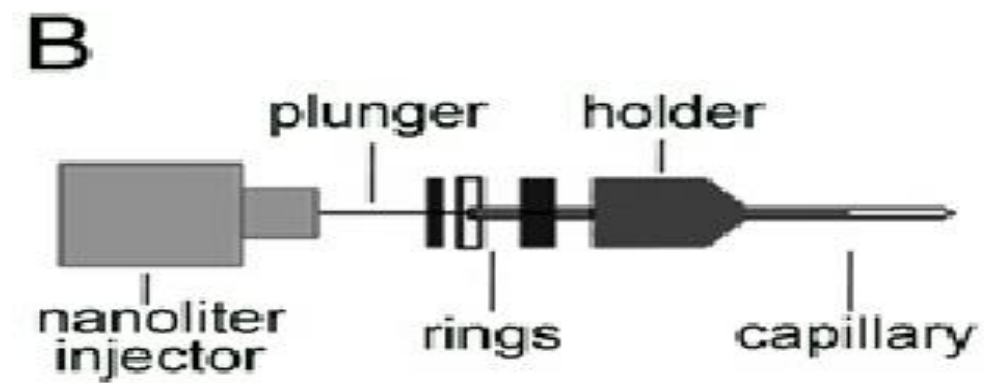
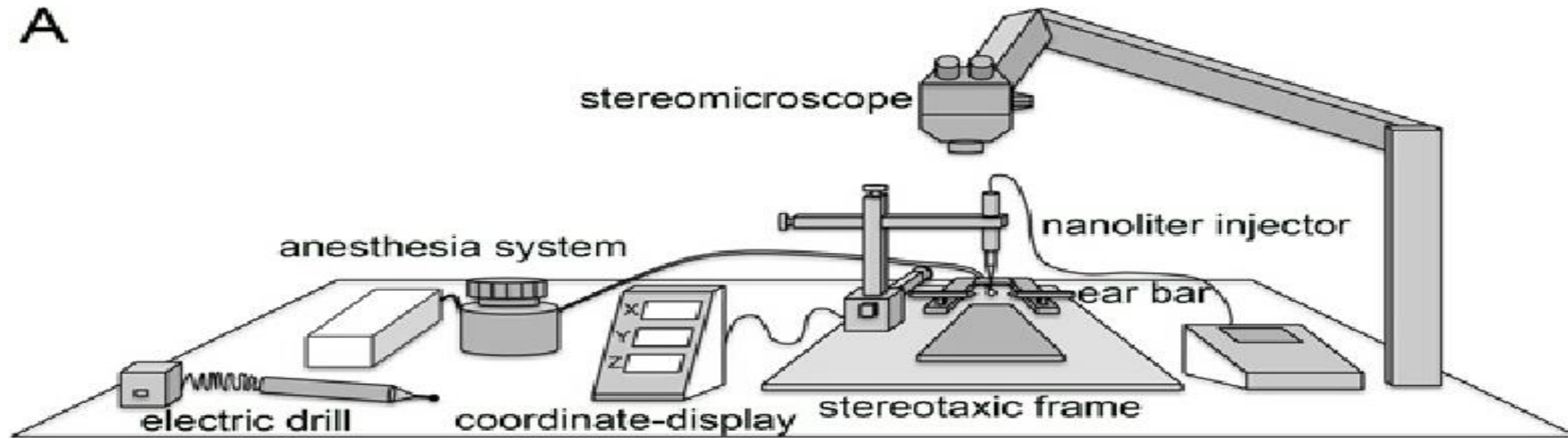


A stereotactic brain surgery is a surgical procedure where lesion, frequently a brain tumor, is removed with assistance of image guidance, that is previously obtained images (usually an MRI) are used to guide the surgeon to the exact location of the lesion to facilitate as accurate a pathway through the brain and safe.

Stereotactic surgery is based on a Cartesian coordinate system, which implies that any point in space may be determined by three right-angled planes defined as the x, y, and z axes.



BLOCK DIAGRAM





WORKING



All types of stereotactic radiosurgery and radiotherapy work in a similar manner. The specialized equipment focuses many small beams of radiation on a tumor or other target. Each beam has very little effect on the tissue it passes through, but a targeted dose of radiation is delivered to the site where all the beams intersect. The high dose of radiation delivered to the affected area causes tumors to shrink and blood vessels to close off over time following treatment, robbing the tumor of its blood supply.



Cont...

The precision of stereotactic radiosurgery means there's minimal damage to the healthy surrounding tissues. In most cases, radiosurgery has a lower risk of side effects compared with other types of traditional surgery or radiation therapy.



ADVANTAGES

- 1. Precision:** Stereotactic radiography allows for precise targeting of specific brain regions, ensuring accurate and focused treatment or research.
- 2. Minimally Invasive:** It is a minimally invasive procedure, reducing the risk of complications and promoting faster recovery compared to traditional open surgeries.
- 3. Customizable:** The technique can be customized to fit the unique needs of each patient or research study, allowing for personalized treatment or investigation.
- 4. Real-time Imaging:** Stereotactic radiography provides real-time imaging, enabling doctors or researchers to monitor the procedure and make adjustments if necessary.
- 5. Reduced Damage to Surrounding Tissues:** By precisely targeting the intended area, stereotactic radiography minimizes damage to surrounding healthy tissues, leading to improved outcomes.

Thank you