

Stereotactic Neurosurgery and Public Awareness

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Abstract:-

In the past half-century, treatment of lesions of the central nervous system, intracranial stereotactic radio surgery (SRS) has become important. It is a powerful and safe valued to in hands of neurosurgeons and radiation oncologists. It is minimally invasive instrument which can offer many option to researchers. The future of stereotactic neurosurgery as a wide range and many applications with possibilities of combining radio surgery for neuromodulation in chonic diseases.

Most of the public think that neurosurgery is brain surgeon. Very few people know neurosurgeon treats disorder of entire nervous system. Around 70% of their time spends for treating spine and peripheral nerve systems.

Keyword:-

Stereotactic neurosurgery, public awareness, central nervous system, peripheral nerve system.

Introduction:-

Since medical terminology and words are quite different than the public language. Neurosurgeons may not have sufficient time to explain. Majority of people, who do not know, “what is going is going on inside operation theatre?” telescopic, endoscopic or laparoscopic or stereotactic surgery are same for ordinary public. People just understand those surgeons do not need to open the entire body section.

Normal people think that it is not surgery in traditional sense because there’s no incision. On other hand technically stereotactic radio surgery uses 3D imaging to target the affected area. Because of high doses of radiation, it is necessary to protect and minimal impact on the surrounding healthy tissue. In other word, people should know and understand, “What is stereotactic neurosurgery?”

When surgeons use stereotactic radio surgery to treat tumours in areas of the other than brain and spine. It is known as stereotactic body radio therapy (SBRT) or stereotactic ablative radio therapy (SARP)

In 1908 Horsely and Clarke developed the first steriotatics apparatus in order to precisely locate the cerebellum of rate. Next spigel and wycis in 1940 developed stereotactic system in human. Finally Lars Leksell and Traugott Riechert and also Robert and wells established frame based stereo static method on basis of linear

computer tomography data. At last use of combined imaging techniques improved the quality and precision of stereotactic techniques.²

Discussion:-

Approximately 200000 patients with brain metastases each year in USA. Patient diagnosed with cancer, 20-40% will develop brain metastases.³

The special type of instrument focuses many small beams of radiation on tumour or target. Each beam has very low energy on tissue but a targeted dose of radiation is delivered to site interact coherently and create huge required impact on target.

The high energy dose of radiation delivered to the affected area. It causes tumors to shrink and blood vessels to close off over the time. It has expanded widely to treat a variety of neurological conditions.

Majors are following:

1. Braintumor 2, arteriovenous malformation
2. (AVM)- Abnormal tangles of arteries and veins in our brain.
3. Trigeminal neuralgia.
It is chronic pain disorder of one or both of the trigeminal nerves.
4. Acoustic neuroma: It is non cancerous tumor develops along main balance and hearing nerve leading to our inner ear to brain.
5. Pituitary tumors. Tumors of the beausized
6. Tremors : It is associated to functional neurological disorders.
7. Non specific cancer : SRS may be used to treat spine cancers.
8. Stereotactic radio surgery is usually on out door patient procedure but one need to stay for whole day. It is advised to have family or friend who can be with patient.
9. Patient may have some fluids.

Conclusion:-

Neurosurgery changes rapidly and constantly Multidisciplinary team approach and technologies are important in neurosurgery. People must know, Frameless stereotaxy has improved accuracy and safety in cranial neurosurgery. Real time imaging is key factor in such surgery. While in spinal surgery orthopaedic techniques is also important. Stereotactic neurosurgery has image advances over ordinary surgery.⁵

Before visit hospital, follow this advices.

- (a) Wear loose fitting comfortable clothing.
- (b) Avoid wearing Jewellery, Eyeglasses, contact lenses, wigs or hair pins.
- (c) Also avoid, makeup, Nail polish, dentures.
- (d) Inform doctor about allergic to shellfish or iodine.

(e) If anything like pacemaker, artificial heart valve have implanted inform doctor.

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Some interesting incidents and points:

1. In USA and later in Japan and European countries against psychosurgery, it fell in disrepute. Logic was that such power in hands of the surgeon to control mental state is dangerous.¹ Surgeon can change “good kind of person into big bad communities.”
2. Stereotactic radio surgery does not involve surgical incision hence less risk involved.
3. People may experience side effect even after the months. After the stereotactic surgery.
4. Almost all types of stereotactic radio surgery work in same manner.

TABLE - 1

Advantages and disadvantages of stereotactic neurosurgery

No.	Advantages	Disadvantages
1	Internal infection chances are very less.	Swelling in the brain near the treatment site.
2	Since it does not involve surgical incisions, patient do not need to stay in hospital too long.	Tiredness and fatigue may occur for first few weeks after the stereotactic neurosurgery.
3	No need to remove lots of hair.	Your scalp may be red irritated at sites where device is attached. Some people temporarily lose a small amount of hair.
4	In majority of cases there is no side effect.	Rare cases, people may experience late side effects.
5	Light weight frame is attached with head to stabilized.	This frame is working as a frame of reference In now a days frame works as a curvilinear co-ordinates.
6	The precision of stereotactic radio surgery means there is minimal damage to the healthy surroundings.	Traditional surgery has such type of risk. Another there is very less margin of error.

CHART – 1

Types of radiation delivery

Linear accelerator	Gamma knife	Proton beam therapy
LINAC machines produce controlled energy photons to treat cancerous and non-cancerous abnormalities in the brain and spine. These machines can perform SRS in a single session. For large tumors or abnormalities, it may take three to five sessions.	These machines use 192 or 201 small beams of X-rays to target brain abnormalities. It is used for small to medium tumors and lesions in the brain associated with various conditions.	This is the newest type of stereotactic radio surgery. It can treat brain cancers in a single session.

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