Brain Tumor Detecting Device

Technology #20160360

Cancerous vs Healthy Brain Tissue

The brain tumor detector design uses a combination of electrical sensors and visual indicators and can intra-operatively determine whether brain tissue is healthy or cancerous. Electrical impedance (as well as mechanical or other tissue properties) can vary between healthy brain tissue and cancerous brain tissue, so the sensors (electrodes) measure these properties to distinguish between cancerous or healthy tissues. The detector features two sensors and two indicators. The sensors, located opposite of each other on the unit, detect electrical characteristics (permittivity and resistivity) of adjacent materials/tissues, measuring a quantity that varies between diseased and healthy tissues. Based on the properties detected, the indicators can light up (possibly in different colors or levels of brightness) when a sensor detects either cancerous tissue or healthy tissue. Leaving behind tumor tissue or resecting normal brain tissue can have devastating results, so this detector could help surgeons locate brain tumors as precisely as possible for complete removal without removing healthy brain tissue.

Brain Surgery Tool

Conventional devices and techniques cannot precisely locate tumor tissue. Intravenous fluorescent dyes that identify brain tumors intra-operatively are limited by the amount that can be used without injuring the patient. Guidance systems are inadequate as well, due to movement of the brain before and during procedures, as the brain may shift after a craniotomy and/or as the tumor is removed, adding uncertainty to the actual border of the tumor. By measuring electrical differences between cancerous and healthy tissue,
this detector surpasses current methods since it can be used while operating. In addition, it can distinguish between any types of tissues that have differing electrical characteristics allowing it to be used for other types of cancers or in other medical applications.

**BENEFITS AND FEATURES:**

- Distinguishes between healthy and cancerous brain tissue
- Intended to be used during surgery
- Features electrical sensors and visual indicators
- Sensors detect electrical characteristics (permittivity and resistivity) of different tissues
- Indicators light up differently for cancerous tissue or healthy tissue
- Can be used on other types of tissues

**APPLICATIONS:**

- Brain tumor surgery
- Brain resection
- Tissue differentiation
- Cancer diagnosis
- Determining cancer/tumor location
- Tumor detection

**Phase of Development** - Prototyped and being tested

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IP: UM Docket 20160360

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