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Opinion Article

Advancements in the Diagnosis and Treatment of Brain Cancer

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DESCRIPTION

The way cancer is treated is changing thanks to precision medicine. Precision medicine customizes treatment for each patient as opposed to adopting the same treatment for all cancer types. To determine the best course of treatment for an individual, precision medicine, sometimes referred to as customized medicine, takes into consideration that person's genes, lifestyle, and environment.

Ten years ago, the location of the disease and how it appeared under a microscope were used to diagnose and treat cancer, respectively. How do we block the biological process in this person that is causing the cancer to spread? Cancer is classified using precision medicine based on the tumor's genetic makeup rather than its location.

Clinical studies are underway for a variety of cutting-edge therapies to enhance and prolong the lives of people with brain tumours, including the notoriously challenging brain malignancy glioblastoma. Here are the developments in brain cancer treatment that are causing a stir.

In the past, surgery was followed by up to 10 visits of traditional radiation within a few weeks as the standard of care for treating metastatic brain cancers. After the resection of the tumour, one part of the brain is treated with radiation using the novel surgical radiation technique known as GammaTile. This is how it goes: Following surgery to remove a brain tumour, radiation is implanted into a titanium-encased collagen sponge and inserted into the brain.

The radiation starts treating the region nearby the site of the tumour removal, which is where most recurrences take place, right away. While receiving treatment, Gamma Tile enables you to carry on with your normal activities. The majority of the radiation will be absorbed by you in the first month. The radiation is almost completely gone by the third month. It's advised to avoid using public transportation, sharing a bed with anyone, and approaching pregnant women during the first few weeks. There aren't many other restrictions.

Liquid biopsy

In the past 15 years, we've discovered that all sorts of cells, including cancer cells, continuously release genetic code fragments into the circulation. This means that we can increasingly utilise a blood or spinal fluid sample, known as a liquid biopsy, in place of invasive, surgical biopsies to determine whether tumours are benign or malignant.

Avatars

Liquid biopsies can track a patient's reaction to treatment and perhaps distinguish between various tumours and malignancies.

A tumour sample from a patient is used to create an avatar, which is then grown externally (in a mouse for example). This enables medical professionals to examine the tumour and research potential treatments to determine which one will be most successful in curing it.

We have this model to examine how the tumour cells are growing while someone is receiving therapy (and while we hope the current treatment is effective), "We are able to administer various medications to the patient's tumour to observe how it reacts. It would advance customised medicine if we could treat a patient based on what we observe in their avatar. Tumor avatars are a promising field for future research, despite their early phases.

Immunotherapy

According to a neurological surgeon from Henry Ford Health, "your immune system assaults infected cells with various diseases to defend your body." But in cases of cancer, these tumour cells manage to evade the body's immune system. The immune system allows the tumour to develop because it is unaware that the cancer cells are dangerous. Particularly brain tumours are renowned for their capacity to evade the immune system.

Utilizing the power of your immune system to fight cancer, immunotherapy. We've made significant strides with

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immunotherapy in treating other cancers, so we're hopeful that it will be beneficial for people with brain tumours as well.

Gliomas are a type of brain tumour whose most aggressive grades are thought to be cancer, and the main treatment for all grades is safe surgical resection. Gross complete resection is the surgical goal; less aggressive resection is used for tumours that may involve the eloquent brain. Expectant surveillance with serial imaging is employed in several situations when comparing risk vs benefit.

Regarding treatment methods, there is a lot of disagreement, especially for grade II lesions like grade II astrocytomas. Institutions may use different radiation and chemotherapy regimens. The therapy methods from recent clinical studies are those indicated below. Treatment or prophylaxis for seizures is frequently necessary.