

BENIGN BRAIN TUMORS: EVALUATION AND TREATMENT PARADIGMS

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Disclosures:

- **NO RELEVANT FINANCIAL DISCLOSURES OR CONFLICTS OF INTEREST IN REGARDS TO THIS PRESENTATION**

J K ROWLING:

- **“It is impossible to live without failing at something, unless you live so cautiously that you might as well not have lived at all – in which case, you fail by default.”**

BENIGN BRAIN TUMOR TYPES - A PERTINENT SELECT GROUP:

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- **Meningioma**
- **Acoustic Neuroma**
- **Pineal Tumors**
- **Choroid Plexus Tumors**
- **Pituitary Tumors**
- **Hemangioblastoma**

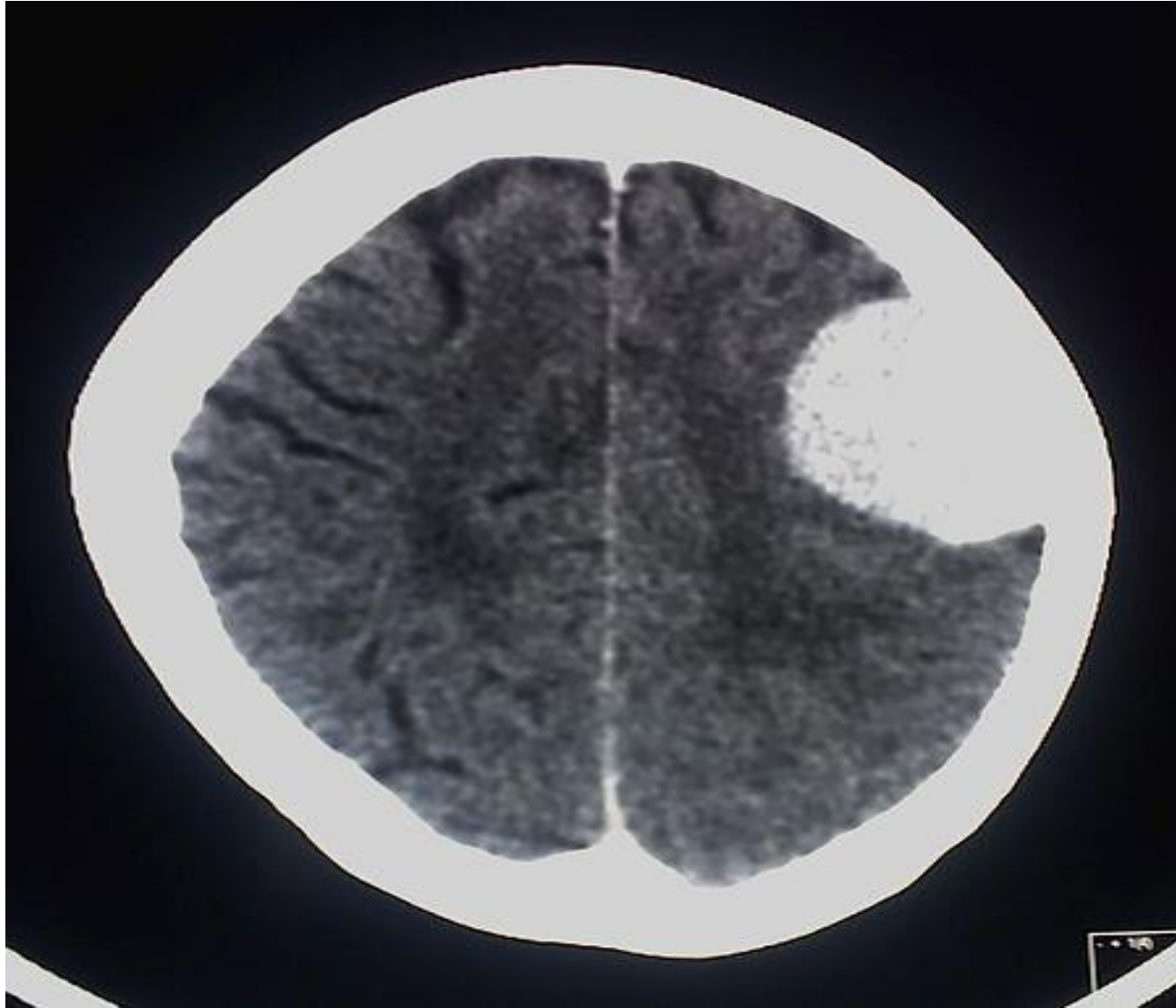
MENINGIOMA:

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- **WHO Grade I Meningioma: ~ 90%**
- **WHO Grade II Meningioma**
 - ▣ **(Atypical): ~ 7%**
- **WHO Grade III Meningioma**
 - ▣ **(Anaplastic): ~ 3%**

CT BRAIN NON CONTRAST: CALCIFIED MENINGIOMA:

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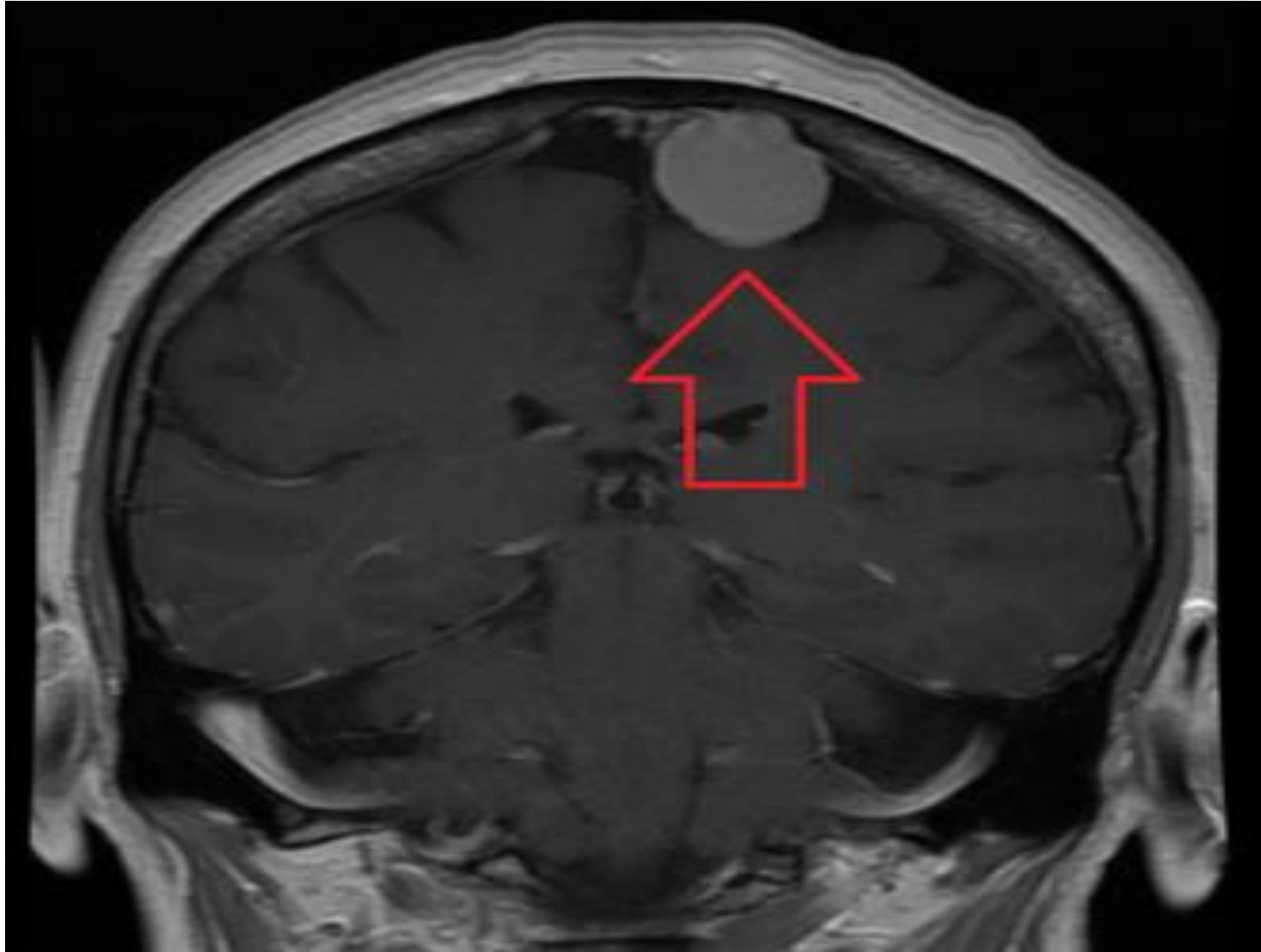
CLINIC CASE 1 PRESENTATION:

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- **Pleasant lady in her 80's, right handed**
- **Had a slip and fall at a New Years Eve party at her house**
- **4 days later presented to the ED with some ongoing headaches**
- **Subsequent MRI Brain with contrast revealed a meningioma**

MRI BRAIN WITH CONTRAST: PARASAGITTAL MENINGIOMA

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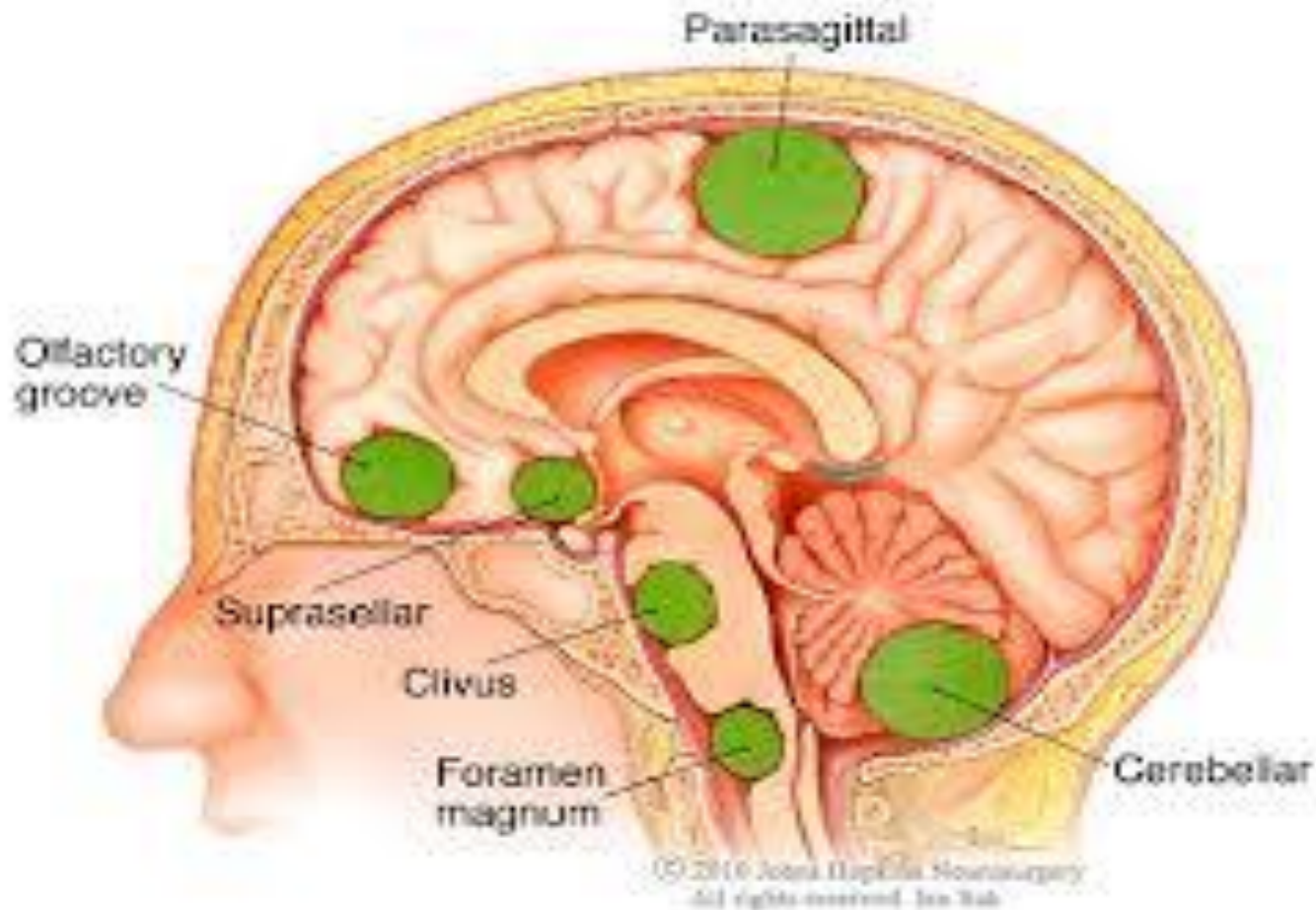
ADVISABLE TREATMENT STRATEGY FOR CASE 1:

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- **Do all meningiomas need to be treated?**
- **Low risk stratification for meningiomas:**
 - **Tumor Size**
 - **Surrounding Edema**
 - **No Acute Impending Complication risk**
(hydrocephalus risk, proximity to the optic apparatus, brain stem compression, spinal cord compression)

MENINGIOMA COMMON LOCATIONS:

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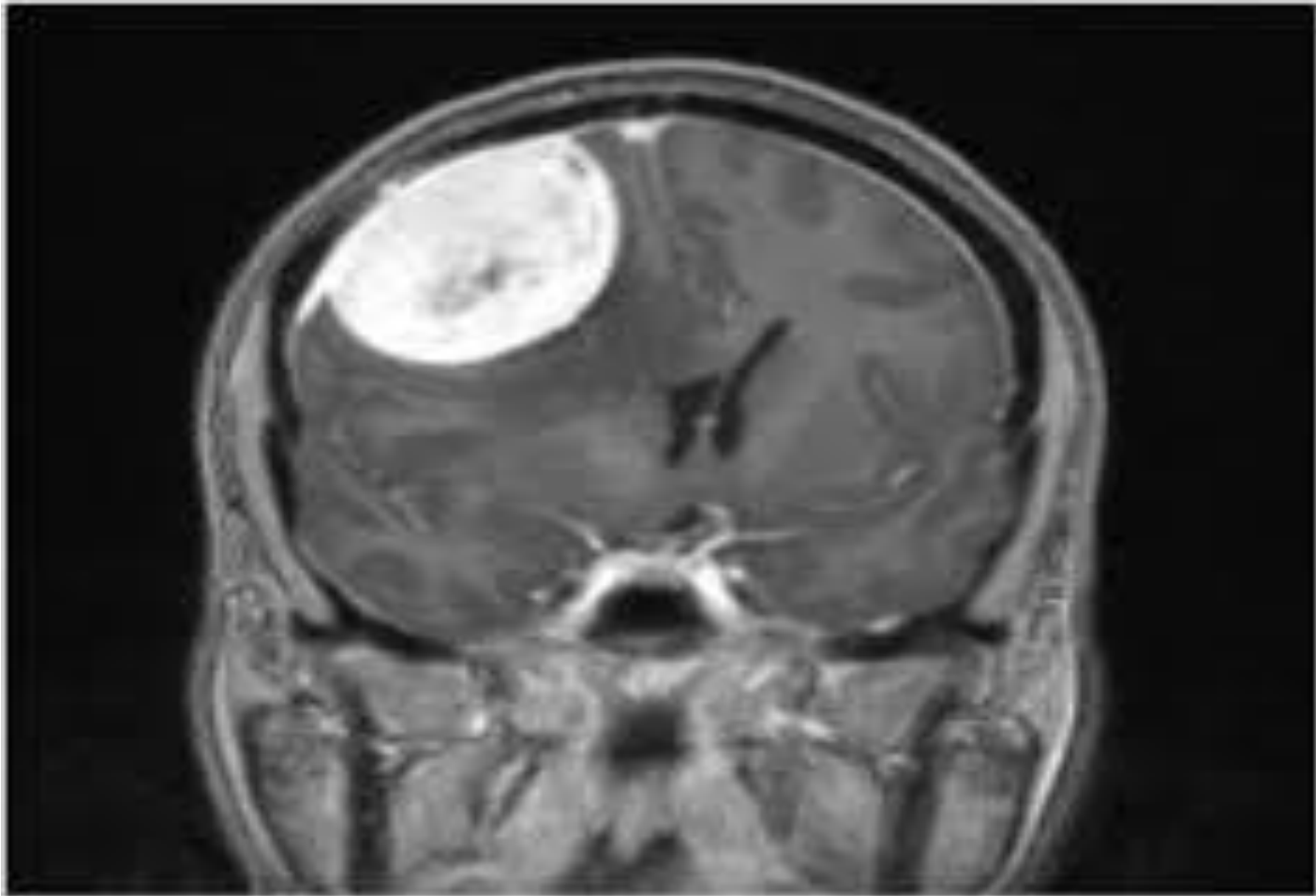
CLINIC CASE 2 PRESENTATION:

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- **Nice lady around 75 years of age left handed**
- **On line college professor and an avid swimmer**
- **Recognized some left hemi body weakness**
- **Evaluated by a Neurologist, left sided upper motor neuron signs**
- **MRI Brain with contrast completed**

MRI BRAIN + CONTRAST: MENINGIOMA

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ADVISABLE TREATMENT STRATEGY FOR CASE 2:

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- **High risk stratification for meningiomas:**
 - **Large size**
 - **Mass effect**
 - **Vasogenic edema and midline shift**
 - **Symptomatic patient**
 - **If patient is a good surgical candidate,
Maximal safe surgical resection would be ideal**
 - **Further recommendation based on WHO Grade
of the meningioma**

SURGICAL OPTIONS FOR MENINGIOMA:

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- **Maximal Safe Resections**
- **“Supra Maximal” Resections**
- **Intra – operative MRI capability**
- **MR Spectroscopy Guided Surgery**
- **MR Perfusion Guided Surgery**
- **Fluorescence Guided Surgery, 5 ALA (5 aminolevulinic acid) Protoporphyrin PP IX**
 - ▣ **Better delineation of tumor margins with 5 ALA versus conventional “white light microscopy”**

RADIATION OPTIONS FOR MENINGIOMA:

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- Radiation still has a major role in meningioma treatment with / without surgical resections**
- Photon based Intensity Modulated RT (IMRT)**
- Stereotactic Radio Surgery (SRS, Cyberknife, Gamma Knife)**

RADIATION OPTIONS FOR MENINGIOMA:

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- **Does Proton Beam Radiation have superiority?**
- **Not clear at the moment?**
- **Gamma Tile (Brachytherapy)**
- **NRG and ALLIANCE conducting clinical trials**

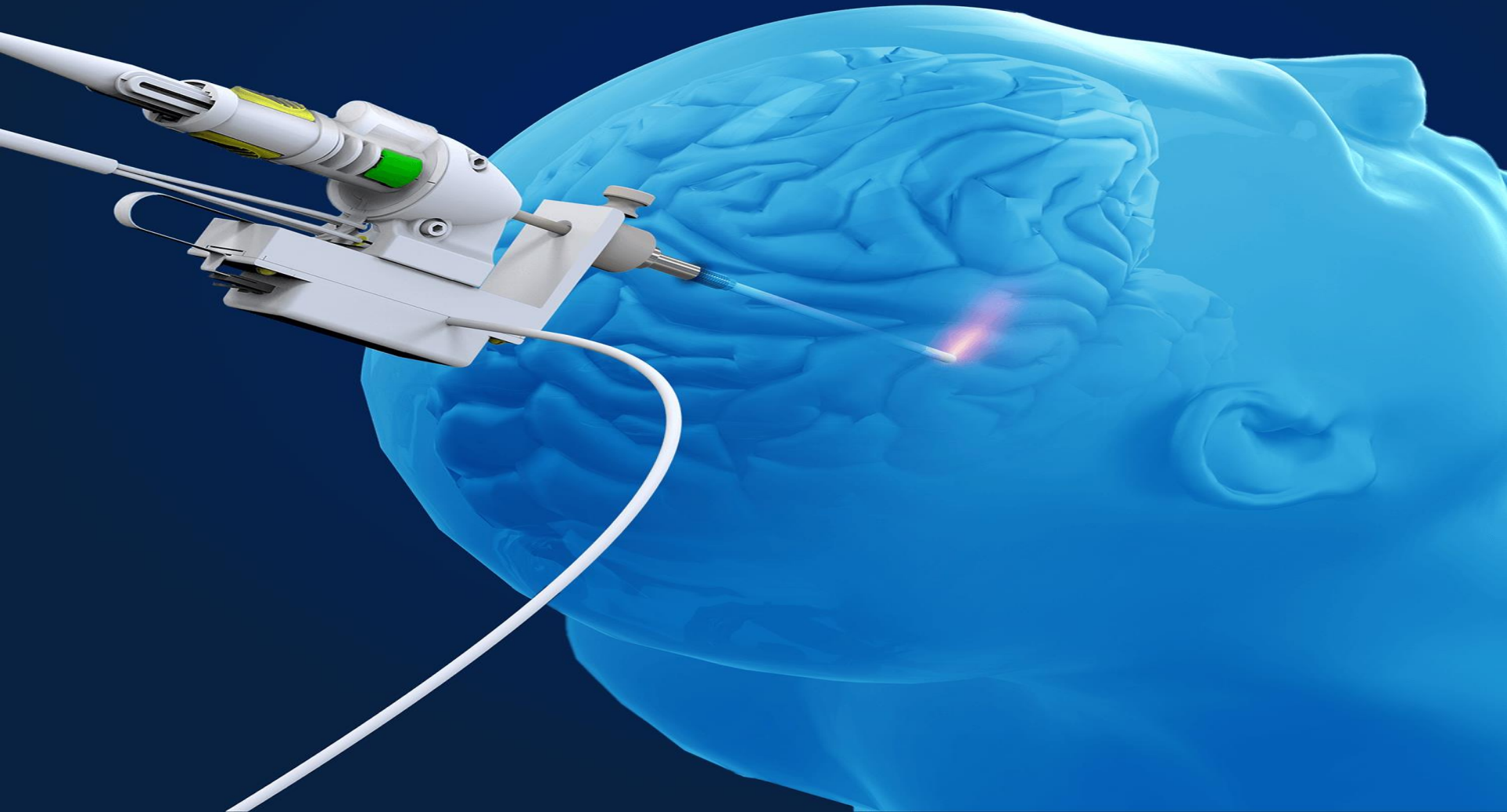
NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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- **Laser Interstitial Thermal Therapy (LITT)**
 - **Thermal ablation**
 - **Intra operative MRI guidance (could be without too)**
 - **Multiple tumor types can be treated as Gliomas, Meningiomas and CNS metastasis**
 - **Necrosis (as post RT necrosis) can also be treated successfully**

NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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- **Gamma Tiles**
 - ▣ **Surgically Targeted Radio Therapy (STaRT)**
 - ▣ **Surgically implanted local RT delivery system**

NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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- ▣ **Clinical Trials in the “Meningioma Space”**
 - **NRG BN 003, WHO Grade II Atypical Meningioma, ?is upfront radiation needed, based on the “Simpson Grading System” of the extent of meningioma resection (Grade 0, I,II, III, IV, V, VI)**
 - **ALLIANCE A071401, SMO / AKT / NF2 / CDK mutated meningiomas and targeting agents for each mutation**

NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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- **Tumor Treating Fields**
 - **Disrupts mitosis**
 - **Impairs microtubular assembly**
 - **Impedes midline localization of the cytokinetic band**
 - **Induction of intracellular dielectrophoresis**
 - **Mitotic failure**
 - **Apoptosis**

NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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batteries and charger



easy-access sleeve bag



convertible 5-in-1 bag



connection cable and box



transducer arrays

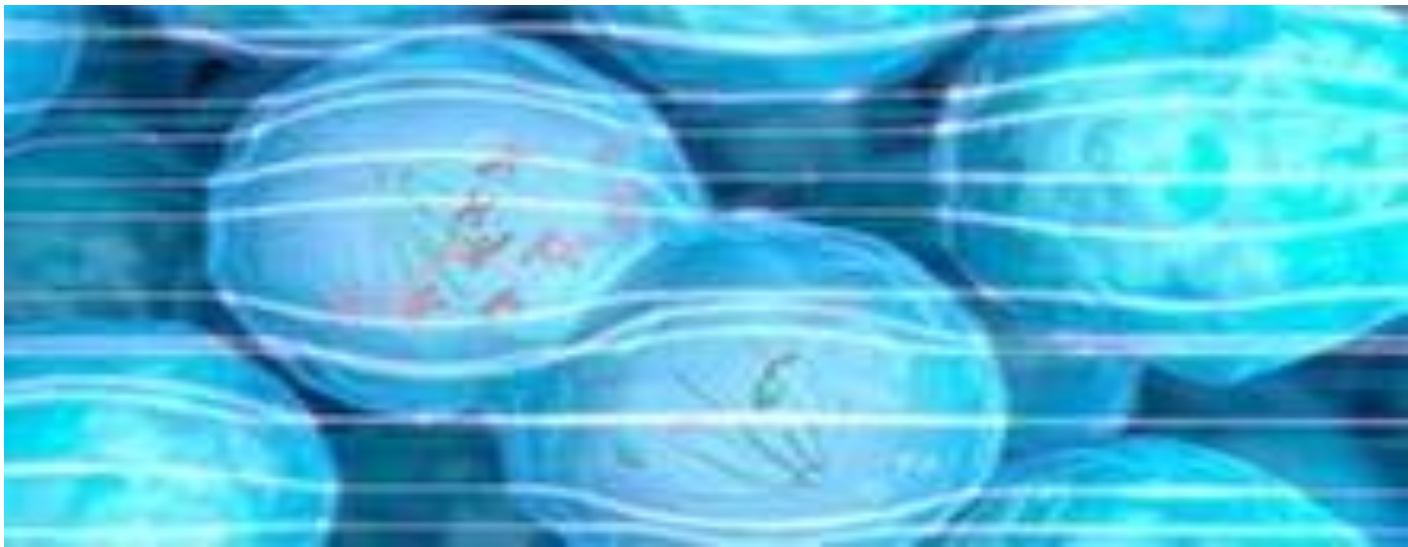


electric field generator



NEWLY DIAGNOSED AND RECURRENT MENINGIOMA:

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Acoustic Neuroma:

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- **8% of Skull base tumors**
- **100,000 cases per year in the US**
- **Generally are WHO Grade I Tumors**
- **Koo's Grading System of Vestibular Schwannoma's**
- **Treatment:**
 - ▣ **Observation (serial audiometry)**
 - ▣ **Surgery**
 - ▣ **Radiation (SRS, Cyberknife, Gammaknife)**

Acoustic Neuroma:

KOOS GRADING

Table 23.3 Koos acoustic schwannoma tumor size grading criteria

Koos Grade I	Purely intracanalicular tumor limited to the internal auditory canal only
Koos Grade II	< 2 cm extracanalicular/CPA extension without brainstem compression
Koos Grade III	Extracanalicular/CPA extension >2 cm, with no brainstem compression
Koos Grade IV	Extracanalicular/CPA extension with any degree of brainstem compression

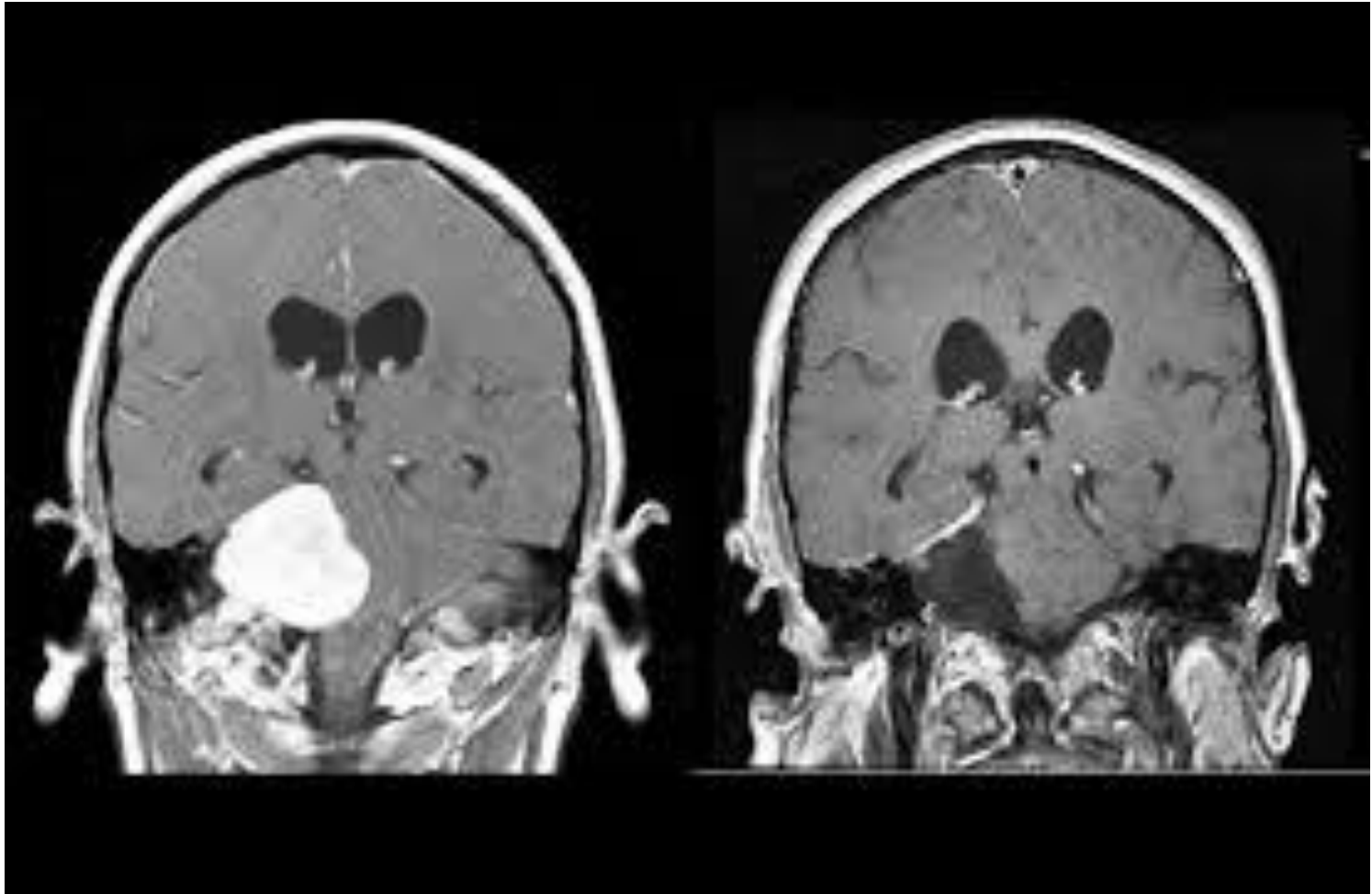
Acoustic Neuroma:

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Acoustic Neuroma:

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ARE WE REALLY WINNING?

J K ROWLING:

- **“Failure is so important. We speak about success all the time. It is the ability to resist failure or use failure that often leads to greater success.”**

HOW CAN WE DO BETTER IN THE MENINGIOMA / BENIGN CNS TUMOR SPACE:

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- **What is new out there?**
- **What are the new promising therapies being explored?**
- **New clinical trials with “real” promise?**
- **Why is the Brain Tumor “space” so convoluted?**
- **How can we use genomic profiling and next generation sequencing (NGS) in our favor?**

CURRENT CHALLENGES IN NEURO – ONCOLOGY:

- **INTRA-TUMORAL HETEROGENEITY**
- **INTER-TUMORAL HETEROGENEITY**
- **“TEMPORAL” HETEROGENEITY**
- **DRIVER MUTATIONS**

CURRENT CHALLENGES IN NEURO – ONCOLOGY:

- **DRUG**
- **TARGET**
- **DRUG DELIVERY (?DOES IT CROSS THE BLOOD BRAIN BARRIER)**
- **BLOOD BRAIN BARRIER DISRUPTION (?Focused Ultrasound)**
- **BETTER DESIGNED CLINICAL TRIALS**
- **“FREE SPIRITED” THINKING**

Upcoming important meetings:

- **ALLIANCE MEETING: MAY, 2021 (CHICAGO)**
- **NRG MEETING: JULY 2021 (VIRTUAL MEETING)**
- **SOCIETY FOR NEURO-ONCOLOGY (SNO)
MEETING: NOVEMBER 2021 (BOSTON)**

Discussion

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