SCaLPEL Erasmus+
Neurosurgical cases

Department of Neurosurgery
Clinical Hospital Centre Zagreb
Medical School, University of Zagreb

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April 11th, 2023

Neurovascular compression syndromes

Intro & Types

- usually compression or distortion of a cranial nerve due to a redundant or aberrant vascular structure
- Not all cases of neurovascular contact are clinically symptomatic
- types:
  - somatic sensory : trigeminal neuralgia , glossopharyngeal neuralgia
  - somatic motor : hemifacial spasm
  - special sensory : tinnitus and vertigo
  - essential hypertension

Most common types ?

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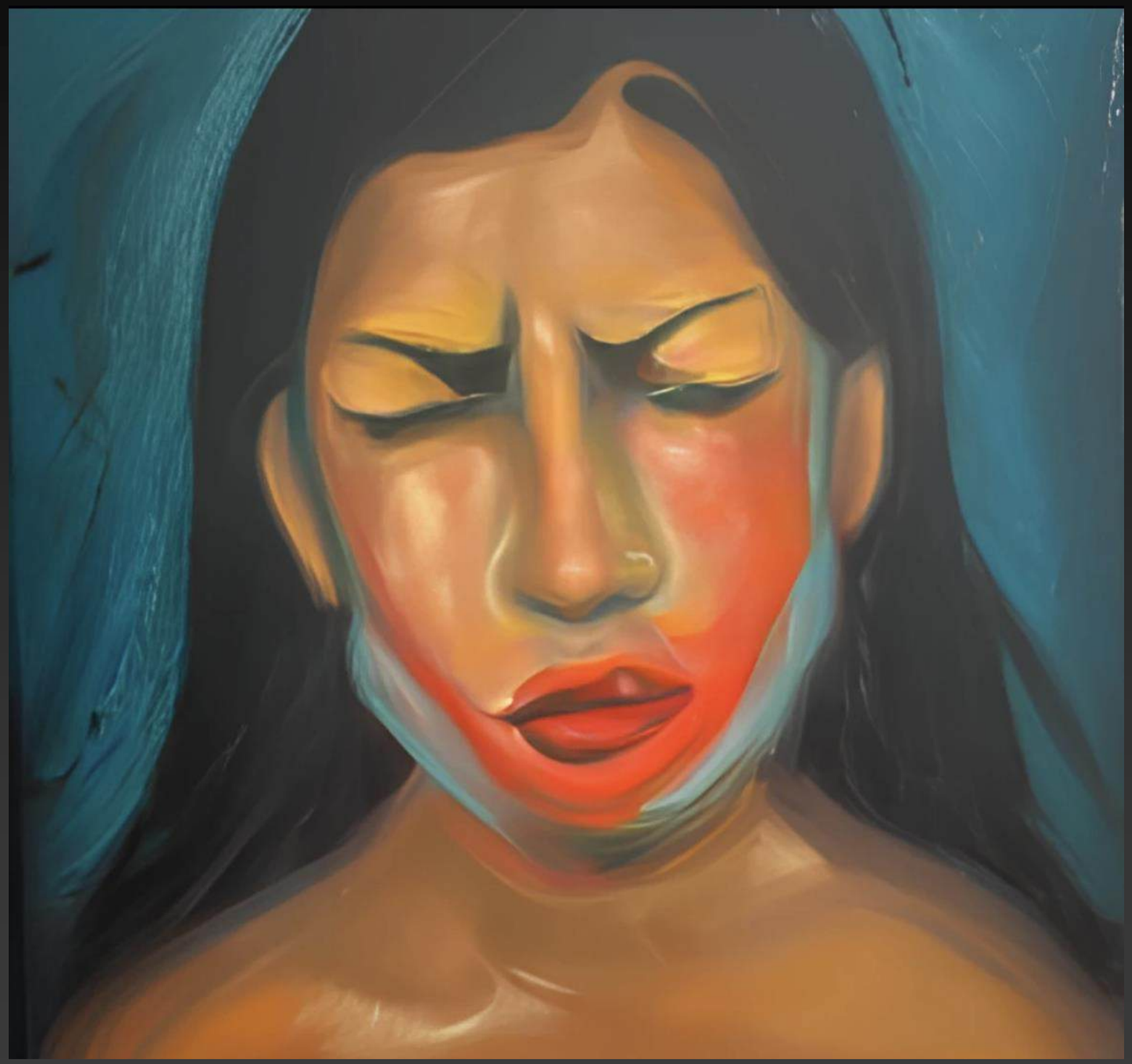
Trigeminal neuralgia



Trigeminal neuralgia

- A disorder characterized by
  - recurrent unilateral brief electric shock-like pains,
  - abrupt in onset and termination,
  - limited to the distribution of one or more divisions of the trigeminal nerve
  - triggered by innocuous stimuli.

- Classified as:
  - Classical (Idiopathic)
  - Secondary

IHS Classification ICHD-3

Trigeminal neuralgia

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  - purely paroxysmal
  - with concomitant continuous pain - previously Atypical (TN 2)
- Idiopathic
  - no electrophysiological or MRI abnormalities

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- **Neuropathy** - caused by another disorder and indicative of **neural damage**
  - **pain usually continuous, burning or squeezing**

Clinical Features

- rare, 4-5 / 100 000 in general population per year
- incidence increases with age
- sex predilection M F

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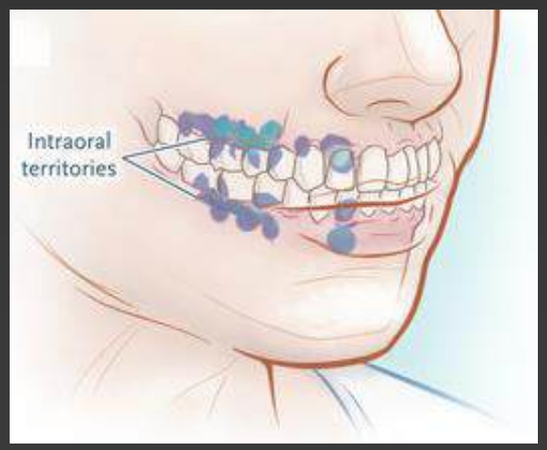
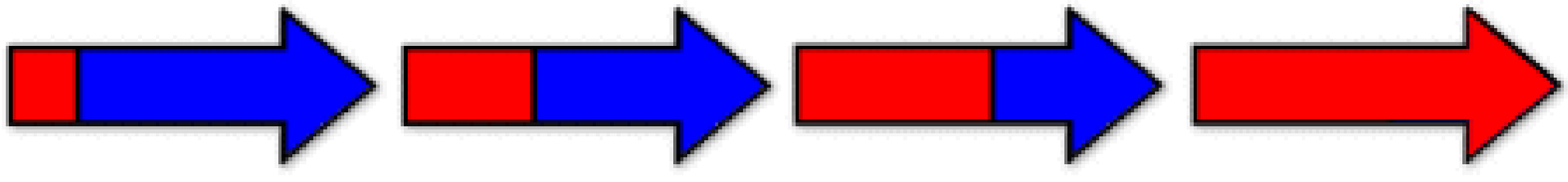
- trigger points



Ropper, Allan H.; Cruccu, Giorgio; Di Stefano, Giulia; Truini, Andrea (2020). *Trigeminal Neuralgia. New England Journal of Medicine, 383(8), 754–762.* doi:10.1056/NEJMra1914484

Progression of Trigeminal Neuralgia Over Time



Early in
Disease Course

Later in
Disease Course

Periods of Exacerbation

Periods of Remission

Differential diagnosis of classical trigeminal neuralgia

- Secondary trigeminal neuralgia
- Dental pain
- Neuropathic pain
- Neurovascular
- Psychogenic

Treatment

Modulation vs Ablation

Treatment

Modulation vs Ablation

i.e.

Non-destructive vs Destructive

Treatment

Modulation vs Ablation

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Non-destructive vs Destructive

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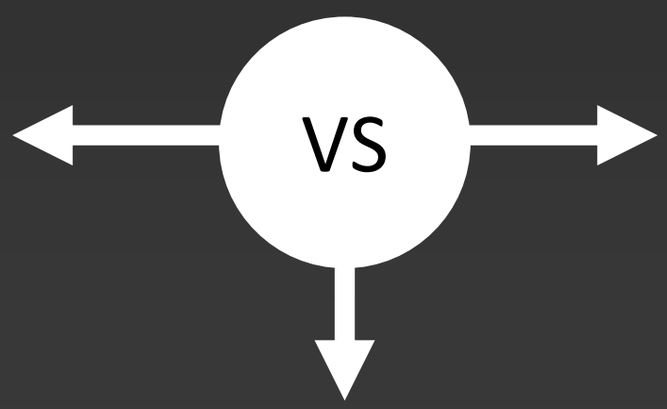
Medical

Surgical (MVD)



Surgical

percutaneous

(balloon, RF, chemical)

Treatment

- Medical (carbamazepine)
- Initial benefit in 75 - 90% on pts
- other medications
  - oxcarbazepine, gabapentine, lamotrigine, topamirate, baclofen, phenytoin, clonazepam, pregabalin…
- limitation in side effects
- offer MVD in all its who have neuromuscular conflict on MRI ?

Surgical treatment

- Percutaneous procedures
- chemical (glycerol rhizolysis)
- mechanical (balloon compression)
- thermal (RF rhizotomy)

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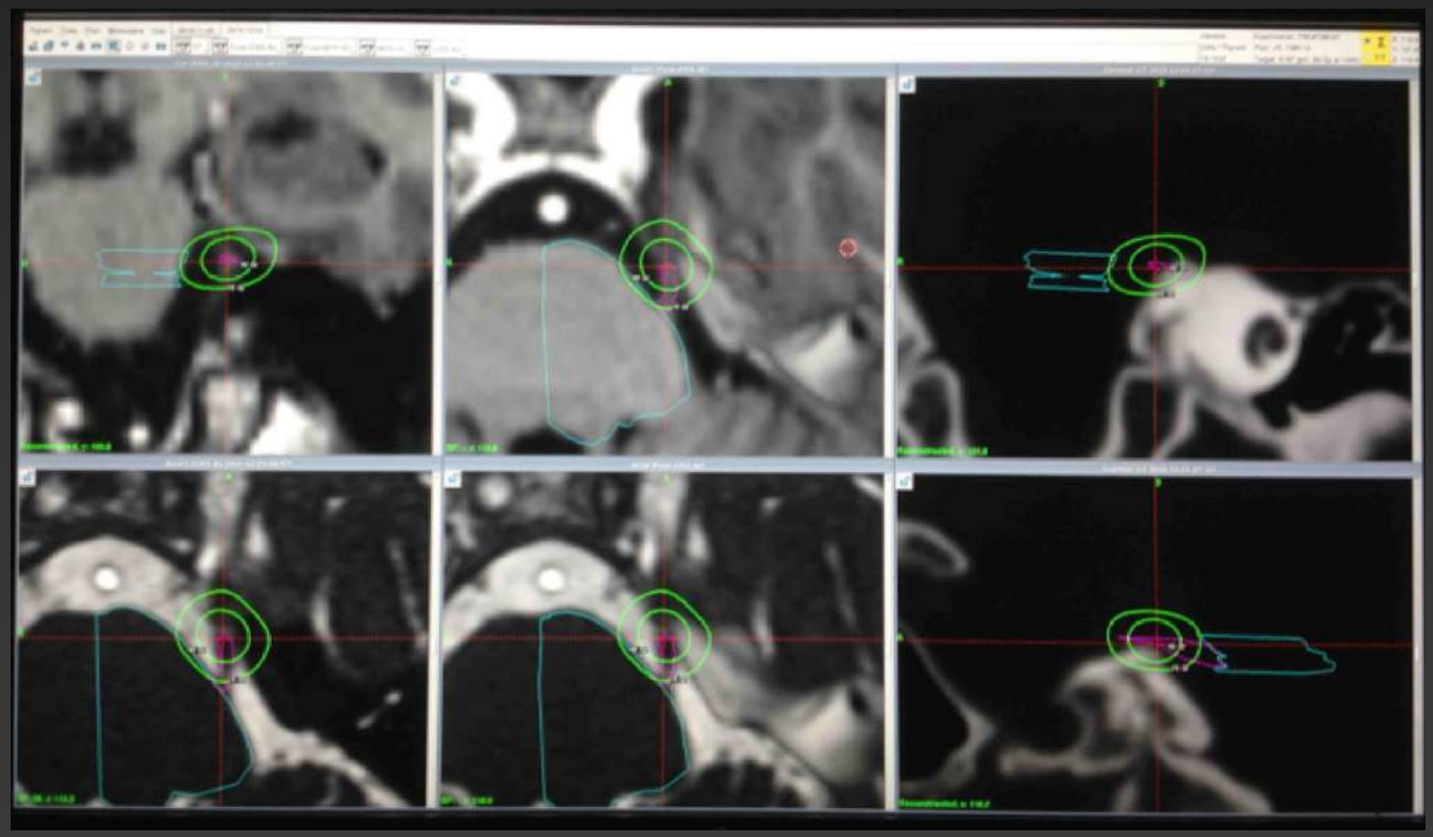
- selective injury to small unmyelinated nociceptive fibres, sparing heavily myelinated fibres serving touch, proprioception and motor function

Radiosurgery

- single dose of high radiation to cisternal portion of nerve
- control of pain BNI I - III achieved in 52% - 85%
- minimally invasive, low risk for paresthesias (25%)
- anaesthesia dolorosa < 1%



effect after 3-4 weeks

< 20% after 10 yrs

can be repeated

Hemifacial spasm

Hemifacial spasm

- neuromuscular disorder
- involves frequent involuntary contractions or spasms of the muscles on one side of the face
- more common in middle-aged or older women
- frequently due to neurovascular conflict

Case 1

Case 1

- 46 y.o. female
- Medical history - healthy
- 5-year history of involuntary twitching of right side of face
- predominantly blepharospasm, but also cheek
- seen many times by neurologist, prescribed clonazepam (Rivotril)
- brain MRI with CISS

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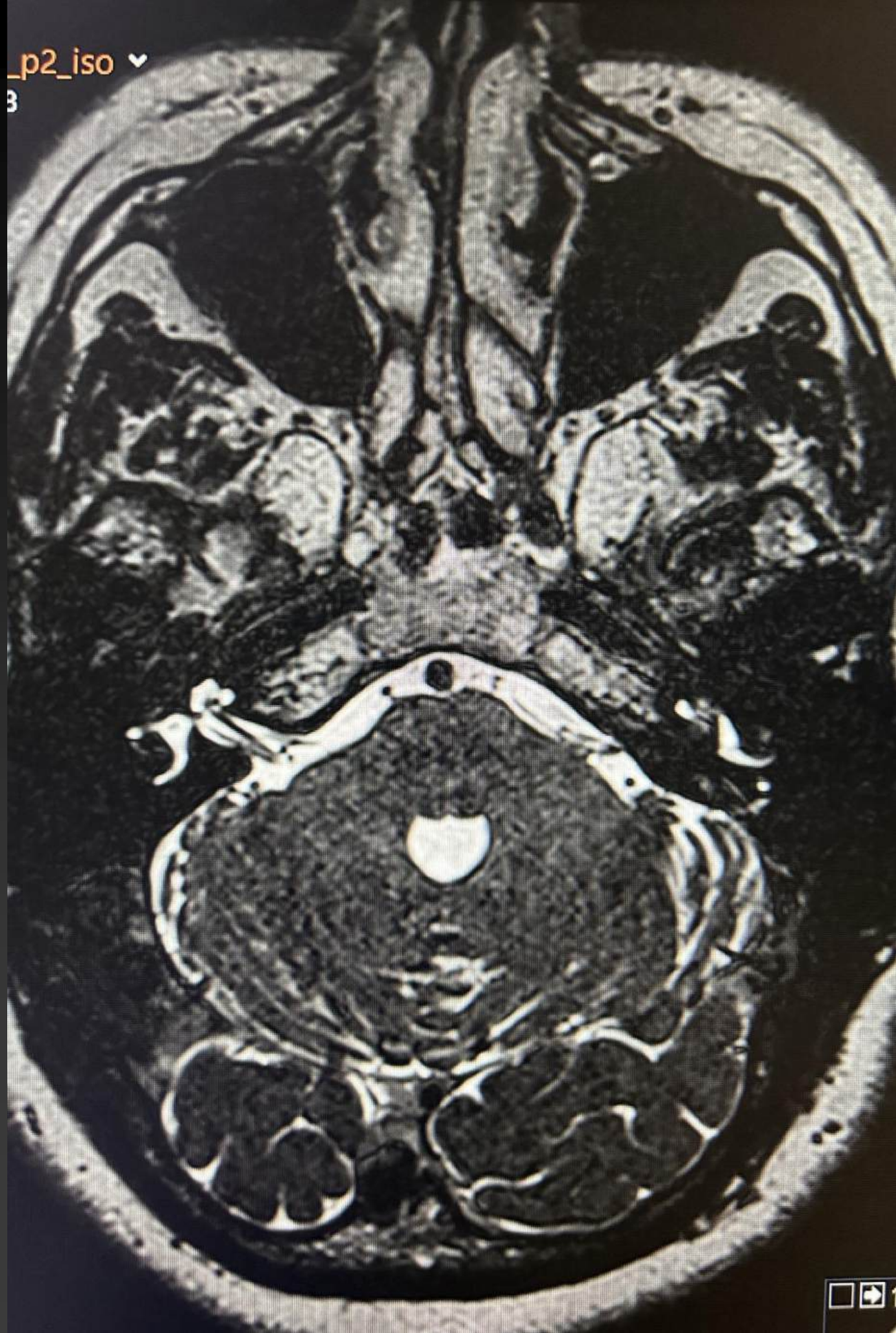

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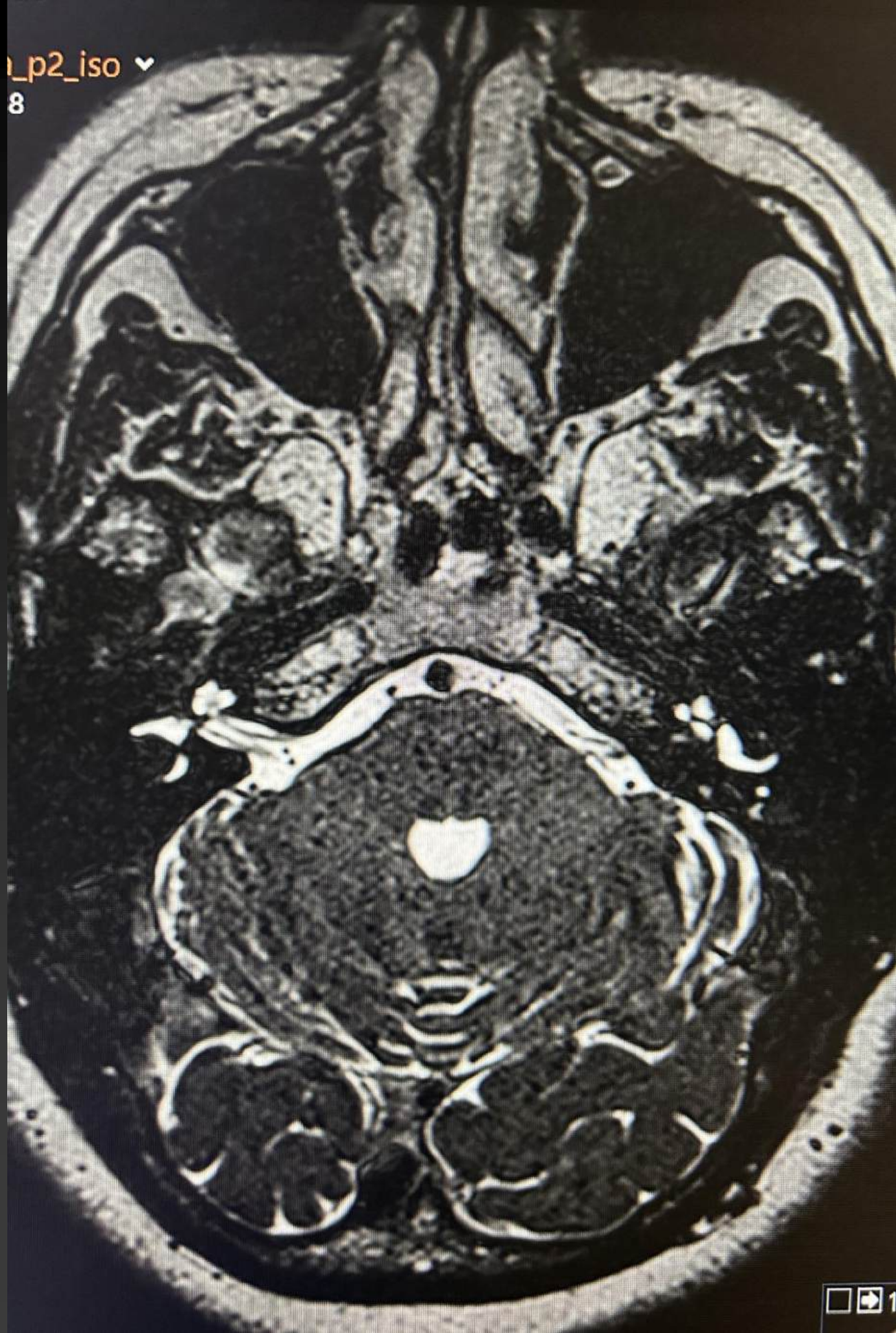

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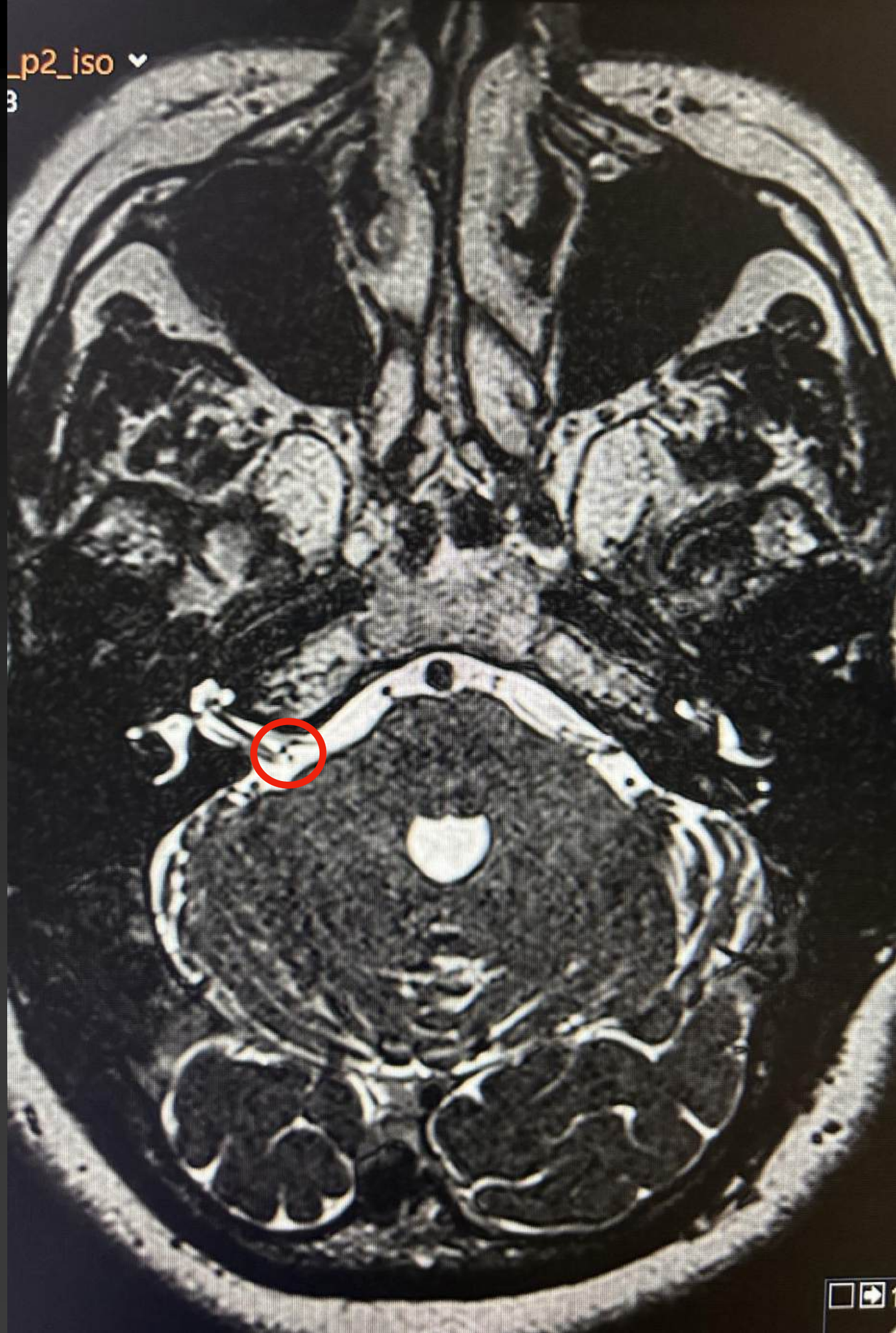
Sign of neurovascular conflict ?

- other possible neurological disturbances ?



Metastatic brain tumors

Intro

- most common brain tumour (slightly over 50%)
- classically, sign of stage IV cancer => less than 1 year of life

- this notion is challenged, because of
  - advancements in oncological treatment
  - … neurosurgery

Presentation

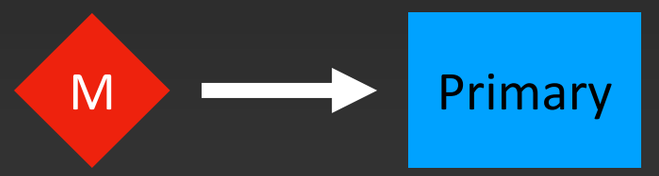
- Metachronous

80%

- Synchronous

14%

- Precocious



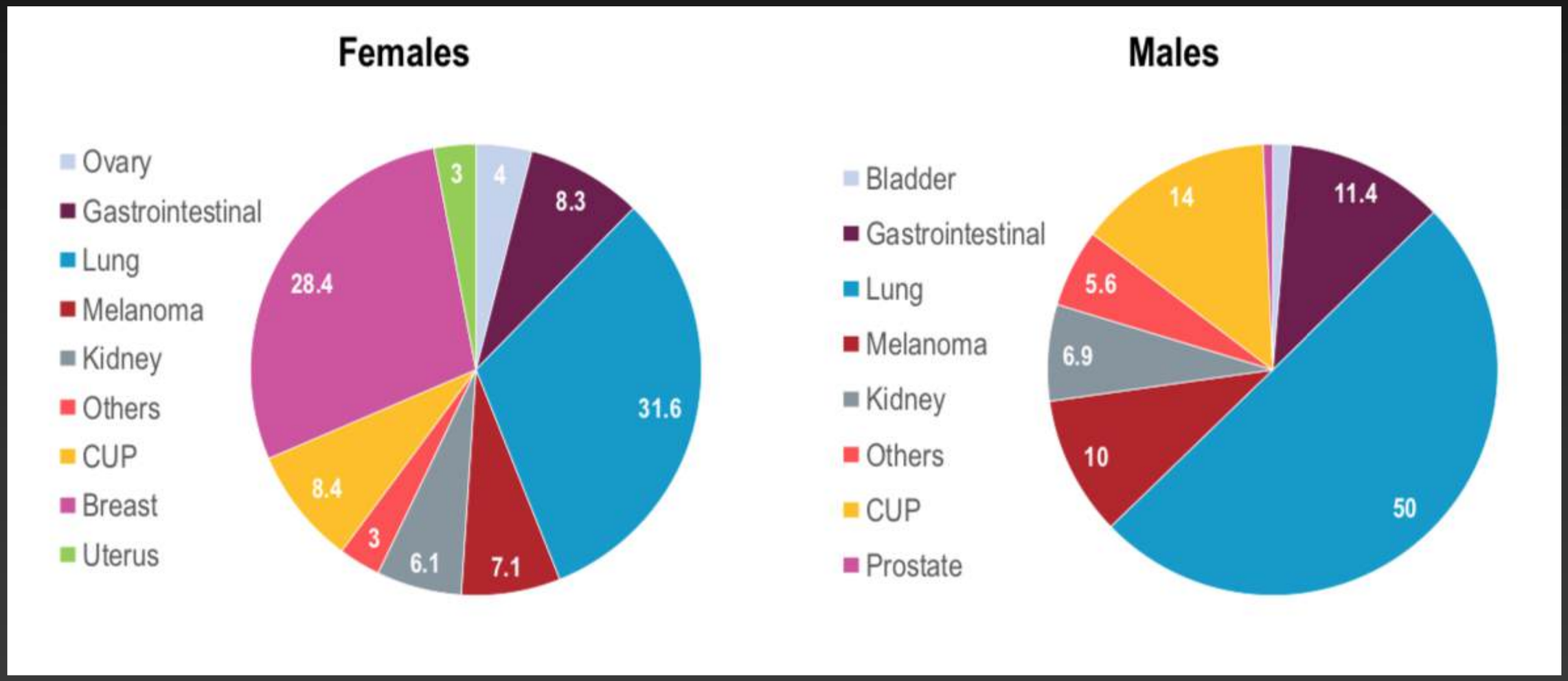
1%

- Unknown primary

5%

Impact on decision making regarding surgery?

Primary tumor types



Primary tumor types

- Lung 30% - 60%
- Breast 15% - 20%
- Melanoma 10% - 12%
- Gastrointestinal (colorectal) 8% - 12%
- Kidney 6% - 8%
- Other 15%
- Unknown 10%

Location

- Cerebral hemispheres 80%
- Cerebellum 15%
- Brainstem 5%

Symptoms

1. Headache > 40%
2. Cognitive (mental) change > 30%
3. Focal weakness 25% - 30%
4. Seizure
5. …

Diagnosis

Neuroradiology

Treatment

Corticosteroids

Surgery

Radiotherapy - Radiosurgery

Chemotherapy

- targeted therapy
- immunotherapy

Best supportive care

Depending on:

- Intracranial pressure
- Symptoms
- Number, size & site of metastases
- Extra-CNS disease control
- Performance status
- Sensitivity to systemic therapy
- Prognostic index: DS-GPA (disease specific-graded prognostic assessment)

CASE 2

Case 2

- 54 y.o. male
- Medical history - kidney stones, otherwise healthy
- 1 month of fatigue, coughing
- chest X-ray - right sided pleural effusion
  - evacuation of 1700 mL of exudate => malignant cells
- CT scan
  - pleural carcinomatosis, parenhymal consolidation, lymphadenopathy
- PDL1 neg, ALK neg, EGFR >80%

Case 2

- Received 1st administration of chemotherapy

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  - head CT then MRI
    - larger parietal M
    - additional 3 minimal M

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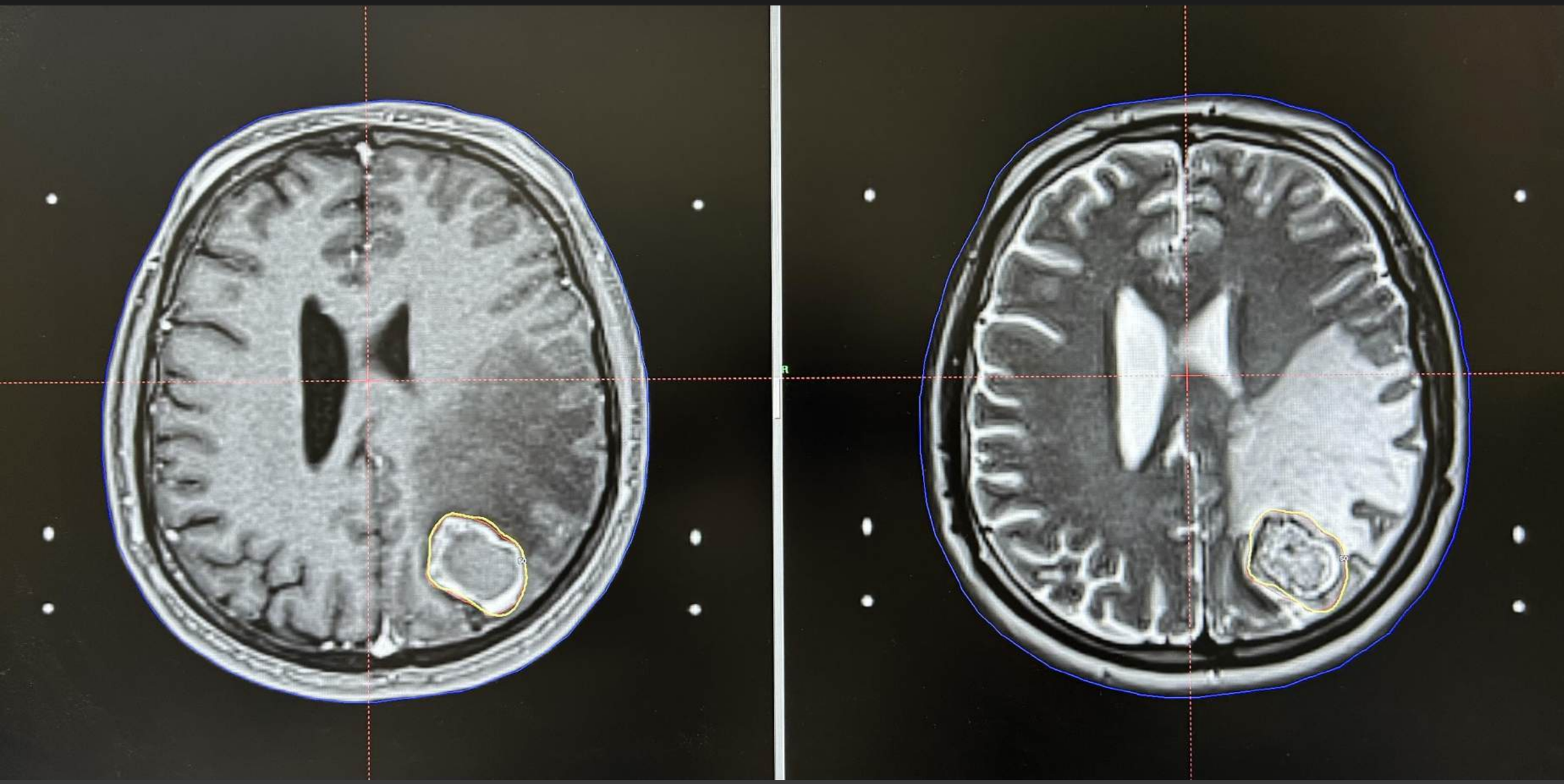
Treatment options ?

Case 2

Radiosurgery



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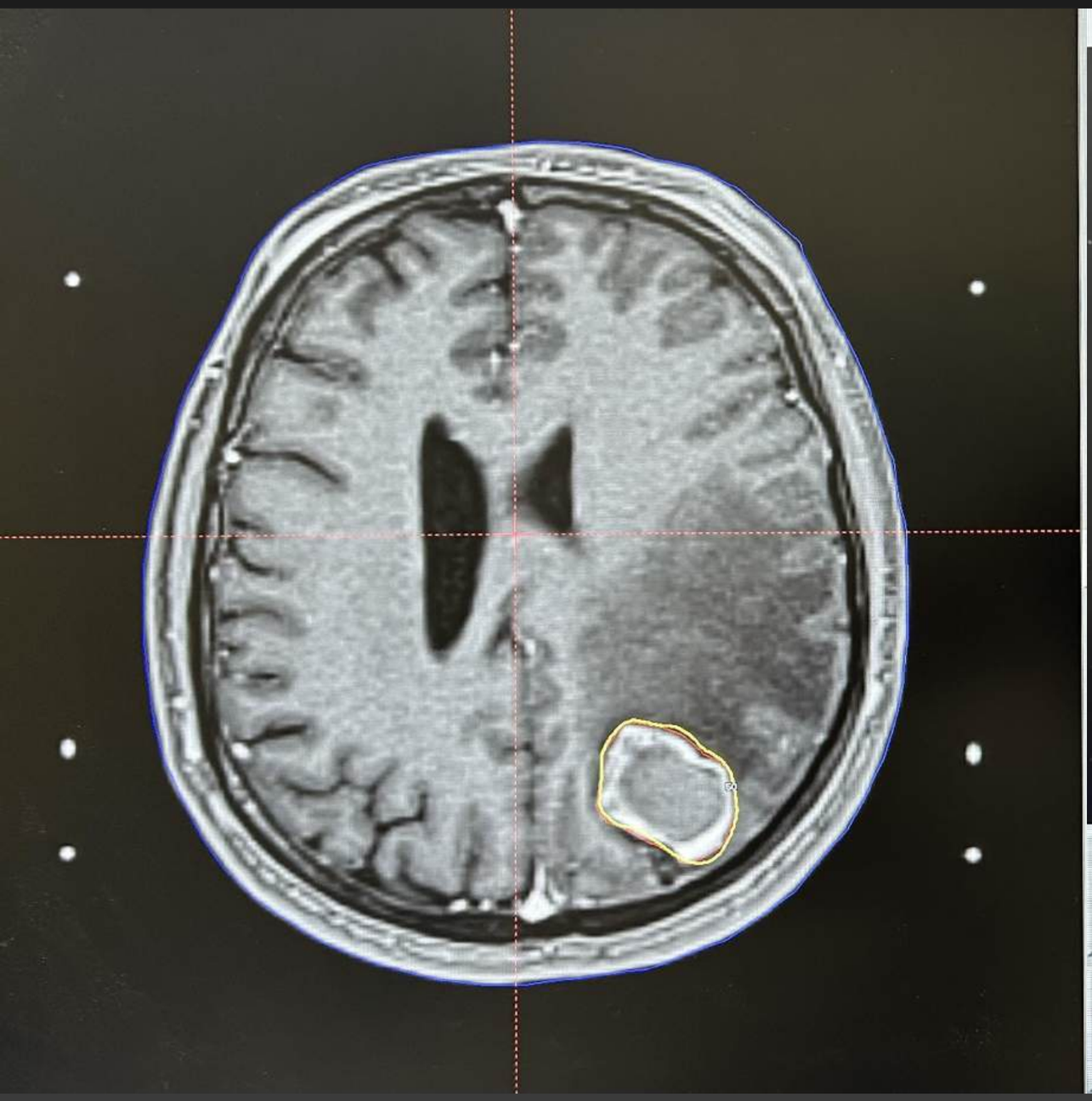

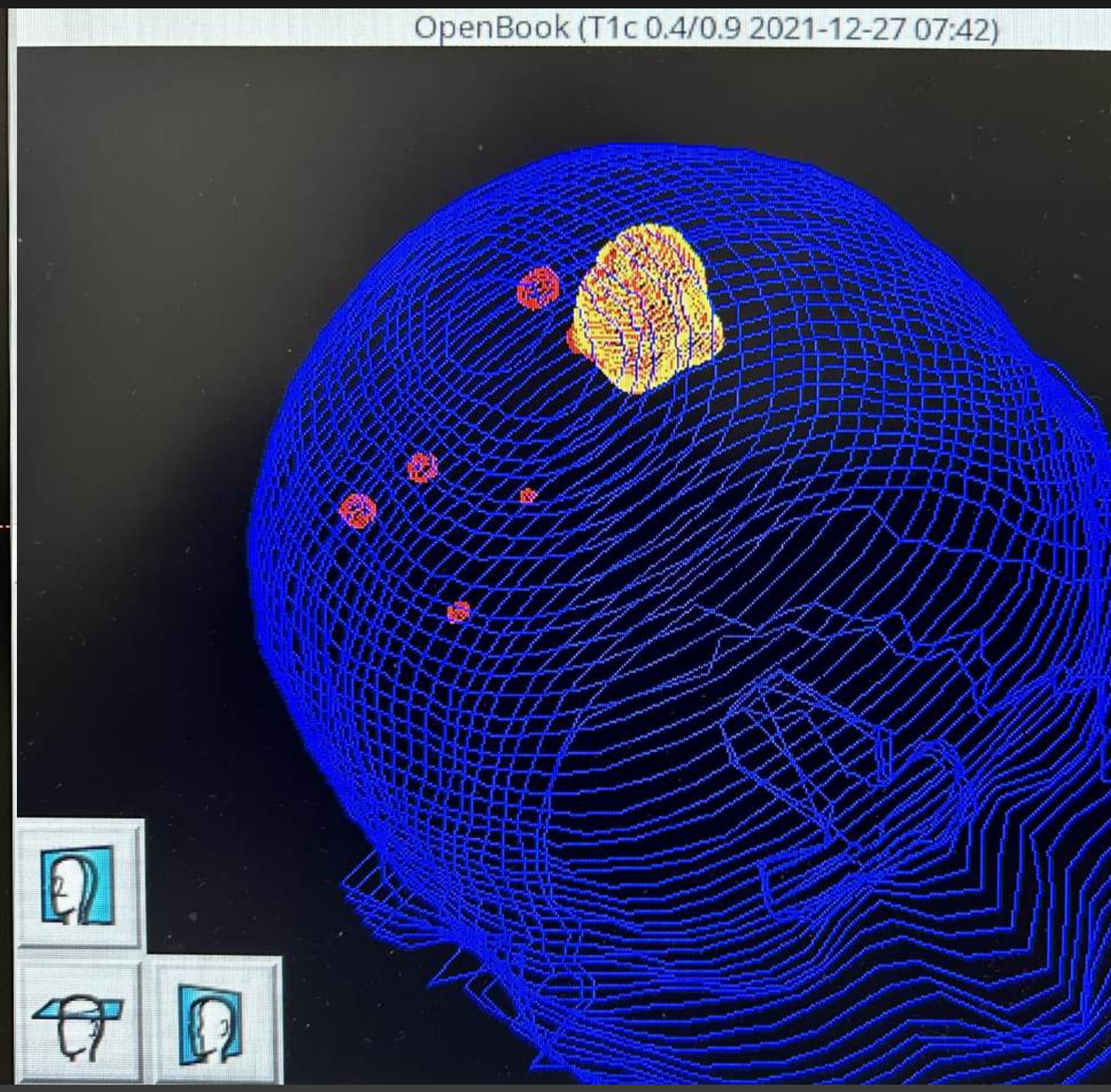

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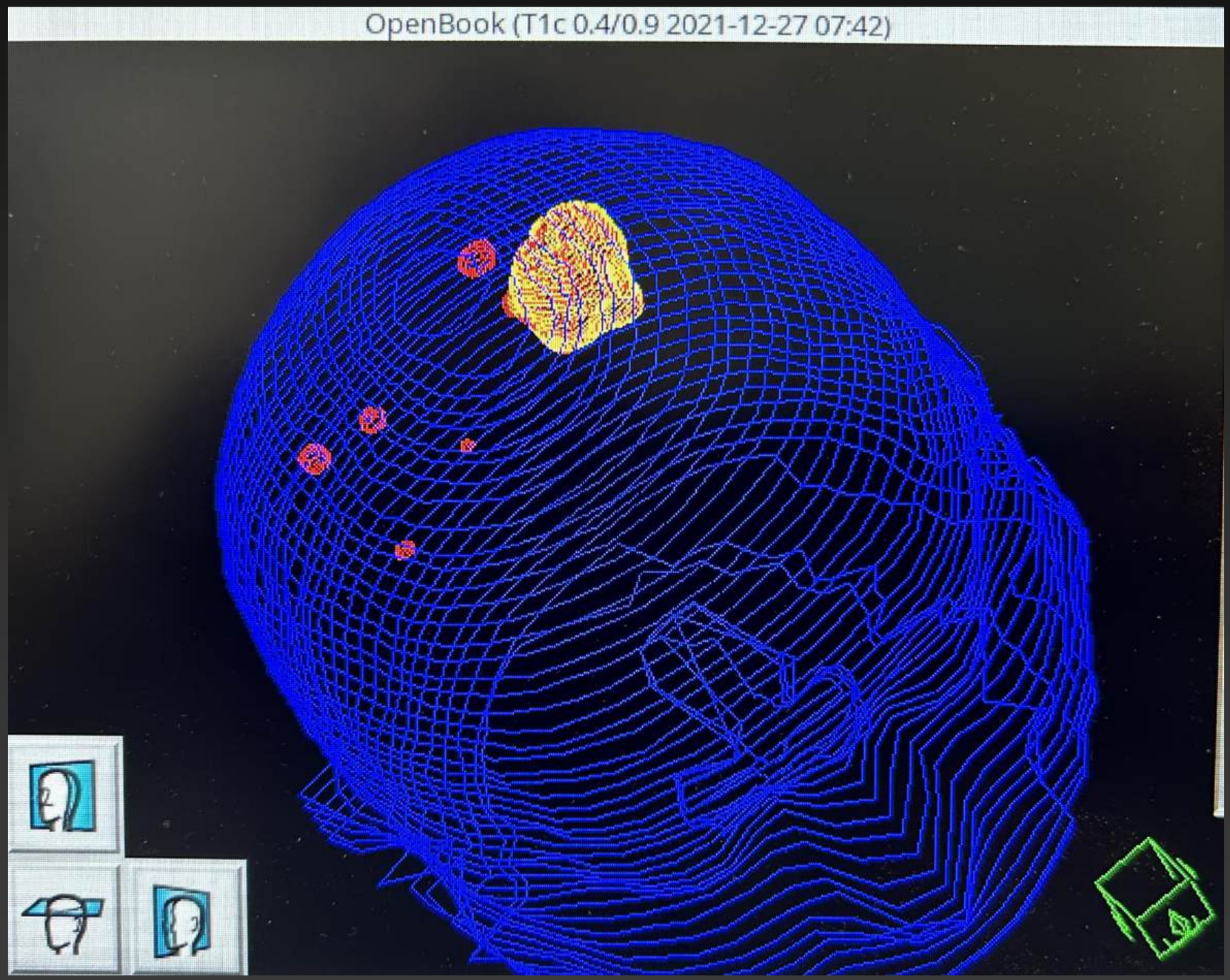

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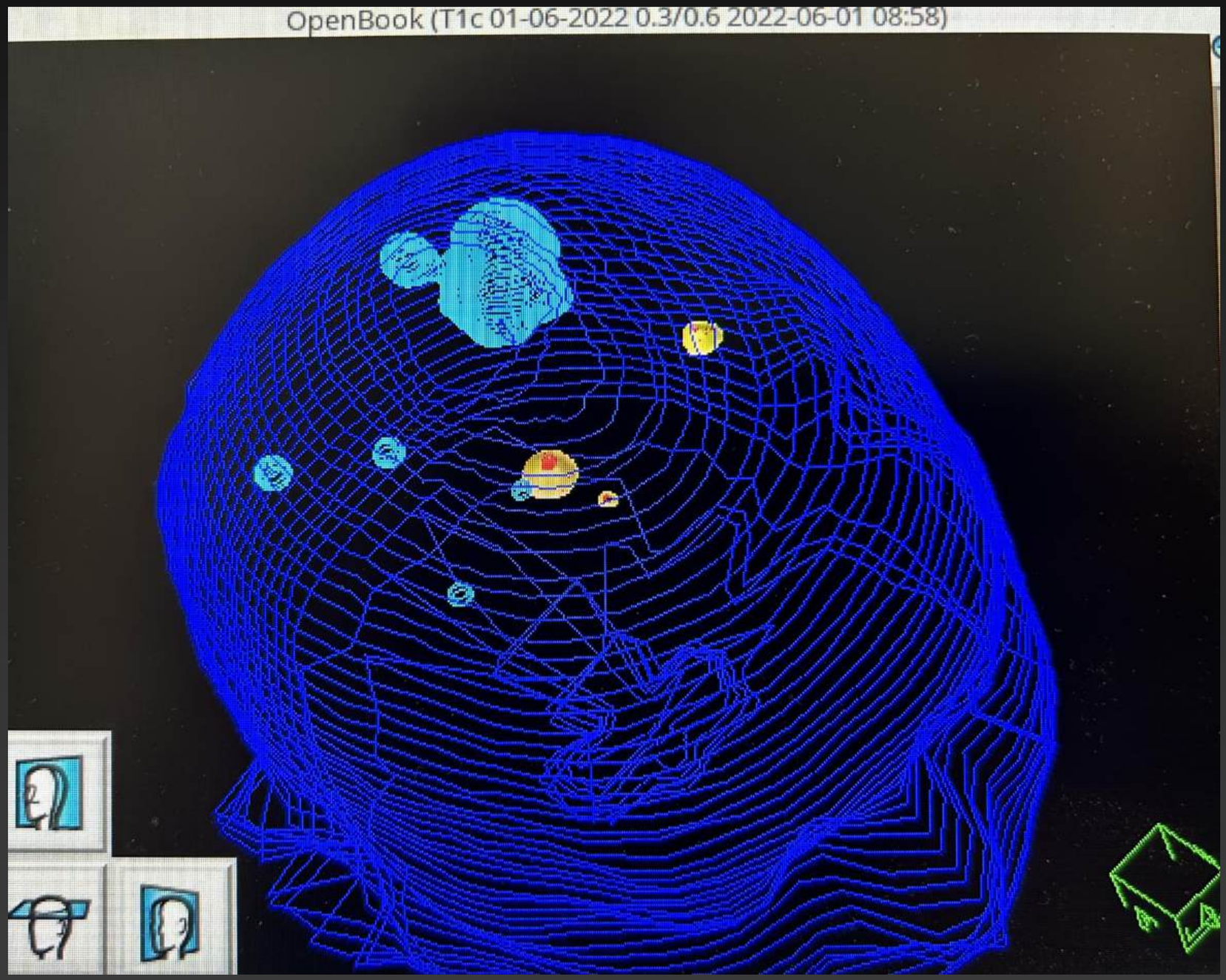
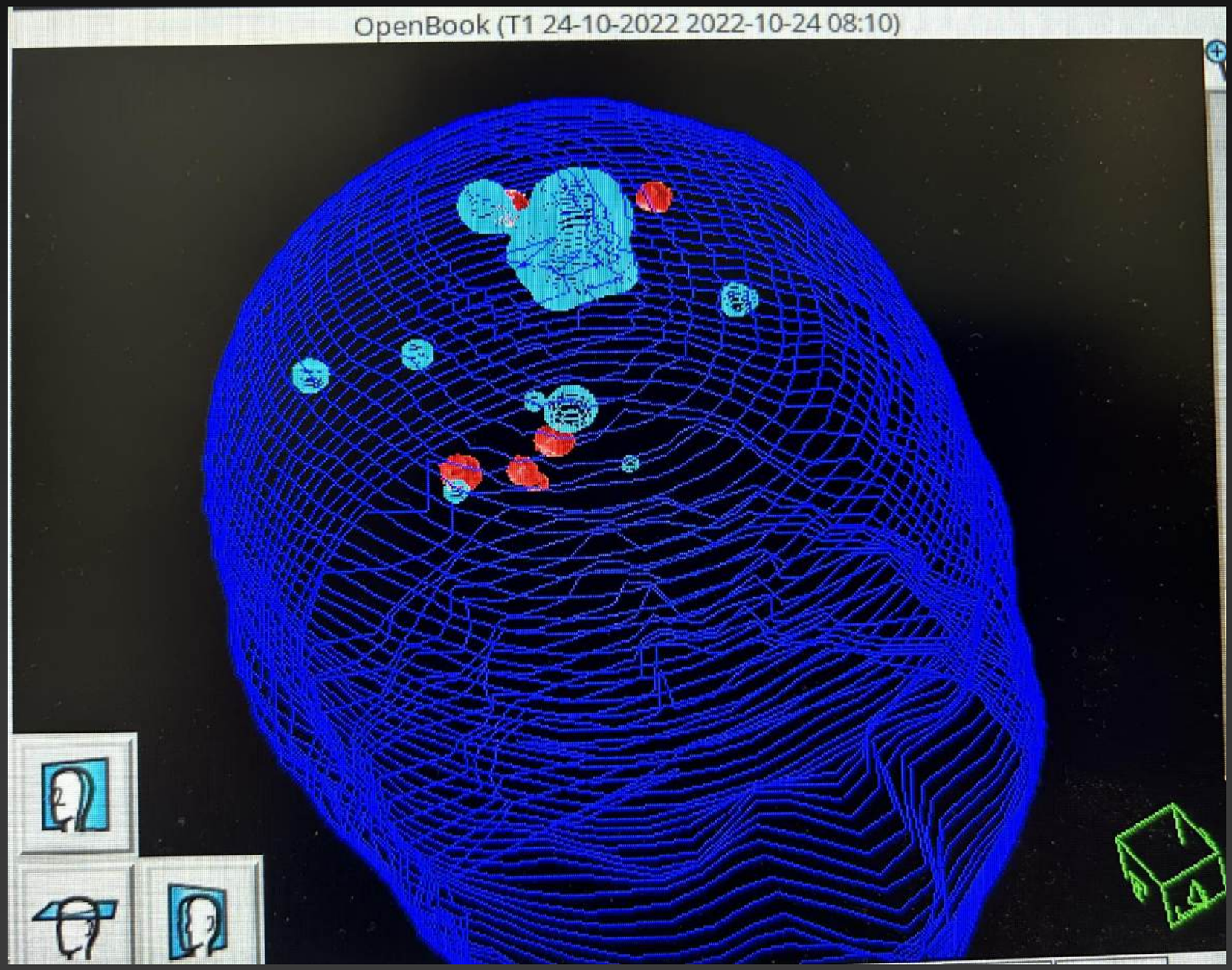


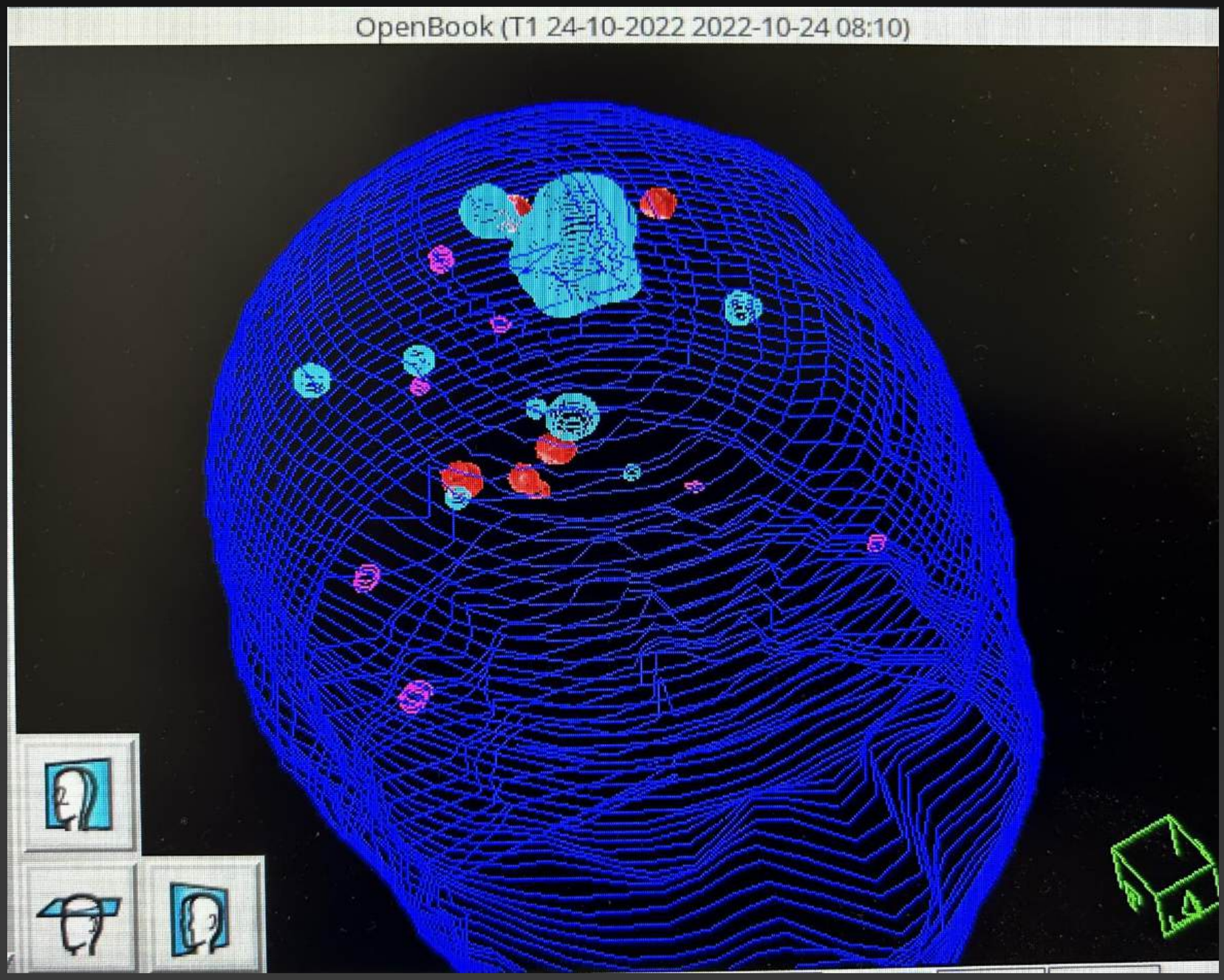
After 6 months - 2nd Gamma Knife radiosurgery

Case 2



After another 4 months - 3rd Gamma Knife radiosurgery

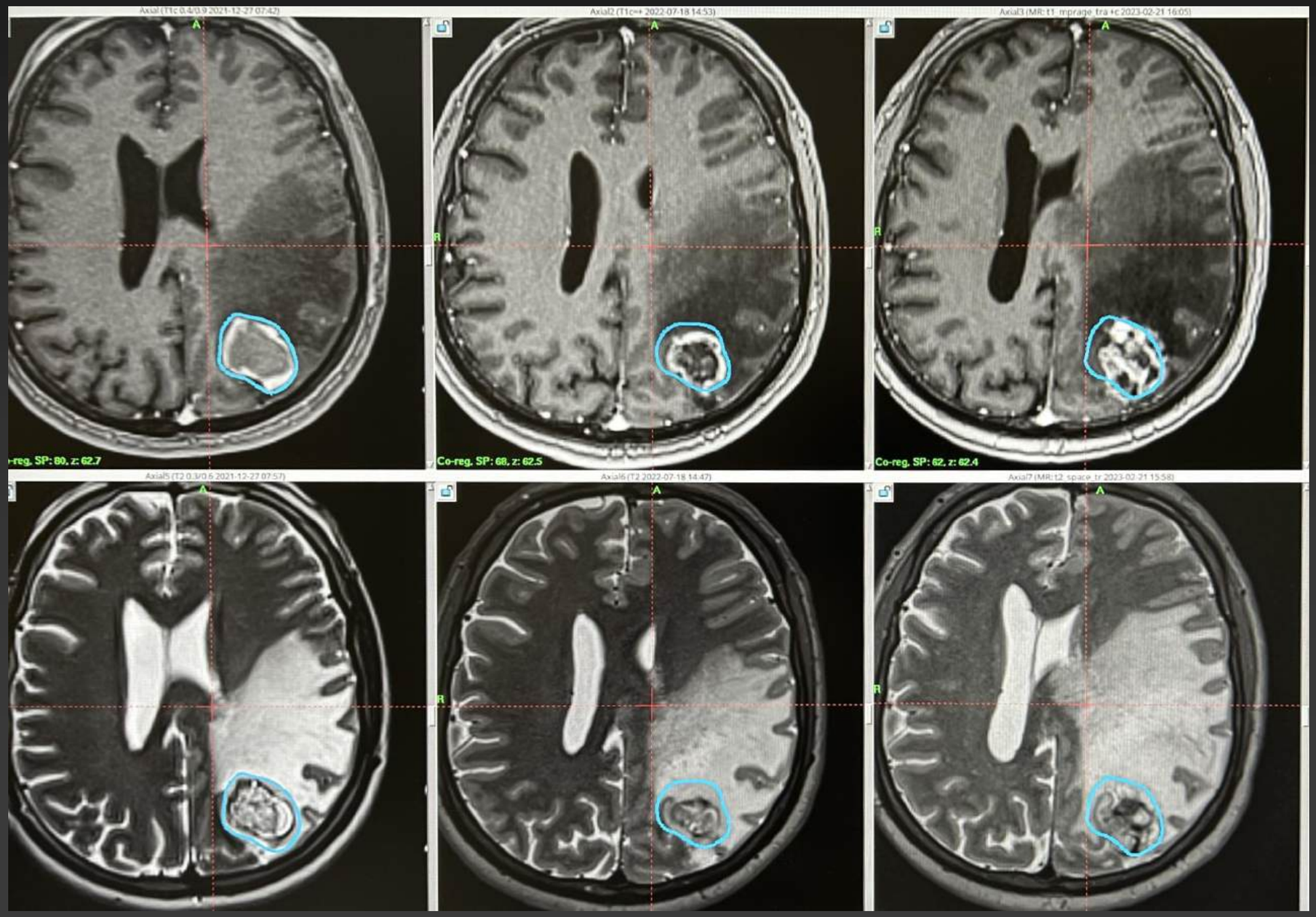
Case 2



After another 3 months - new M - 4th Gamma Knife radiosurgery ?

Case 2

- Patient worsening of headaches, no neurodeficit
- corticosteroids on / off



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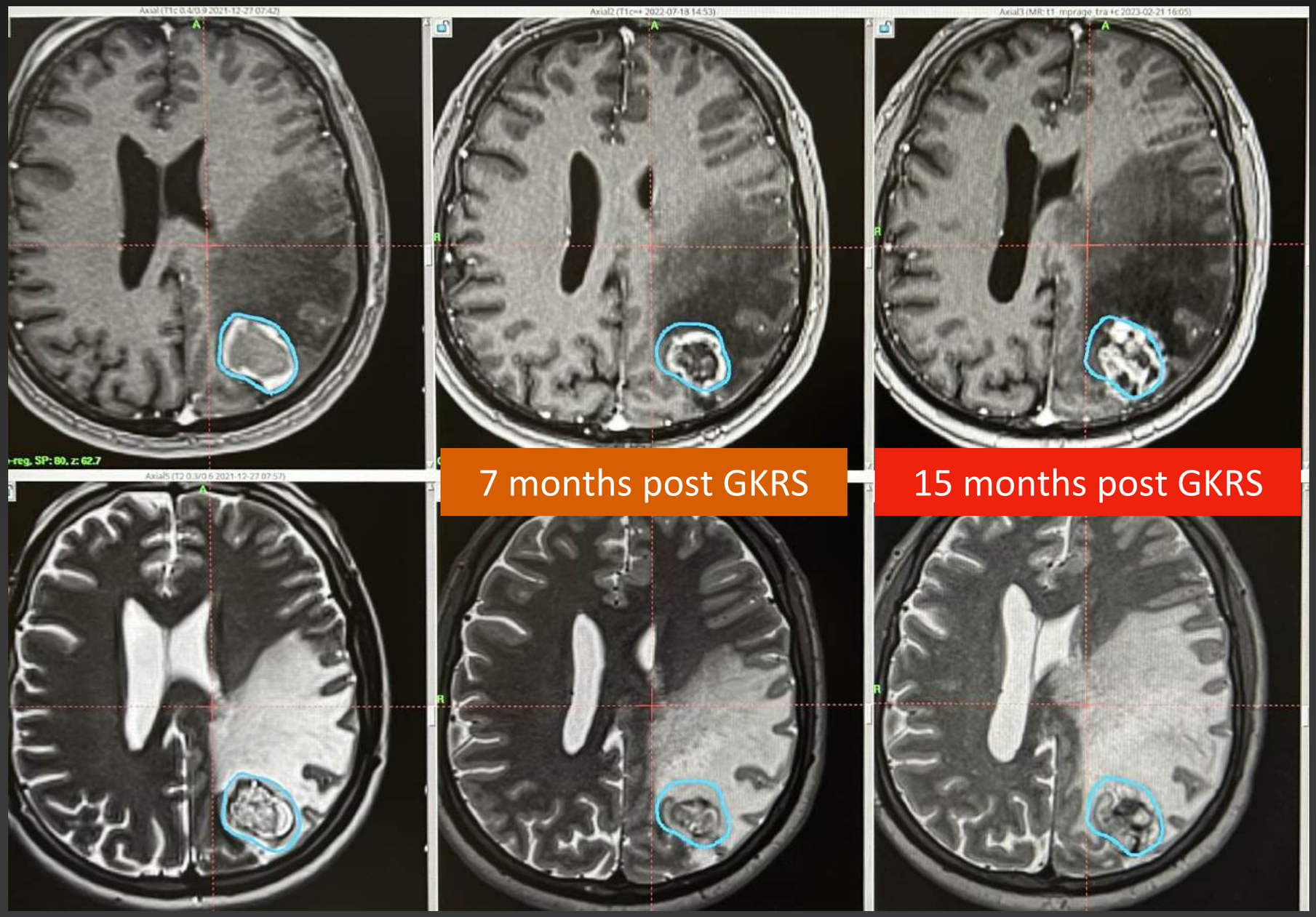

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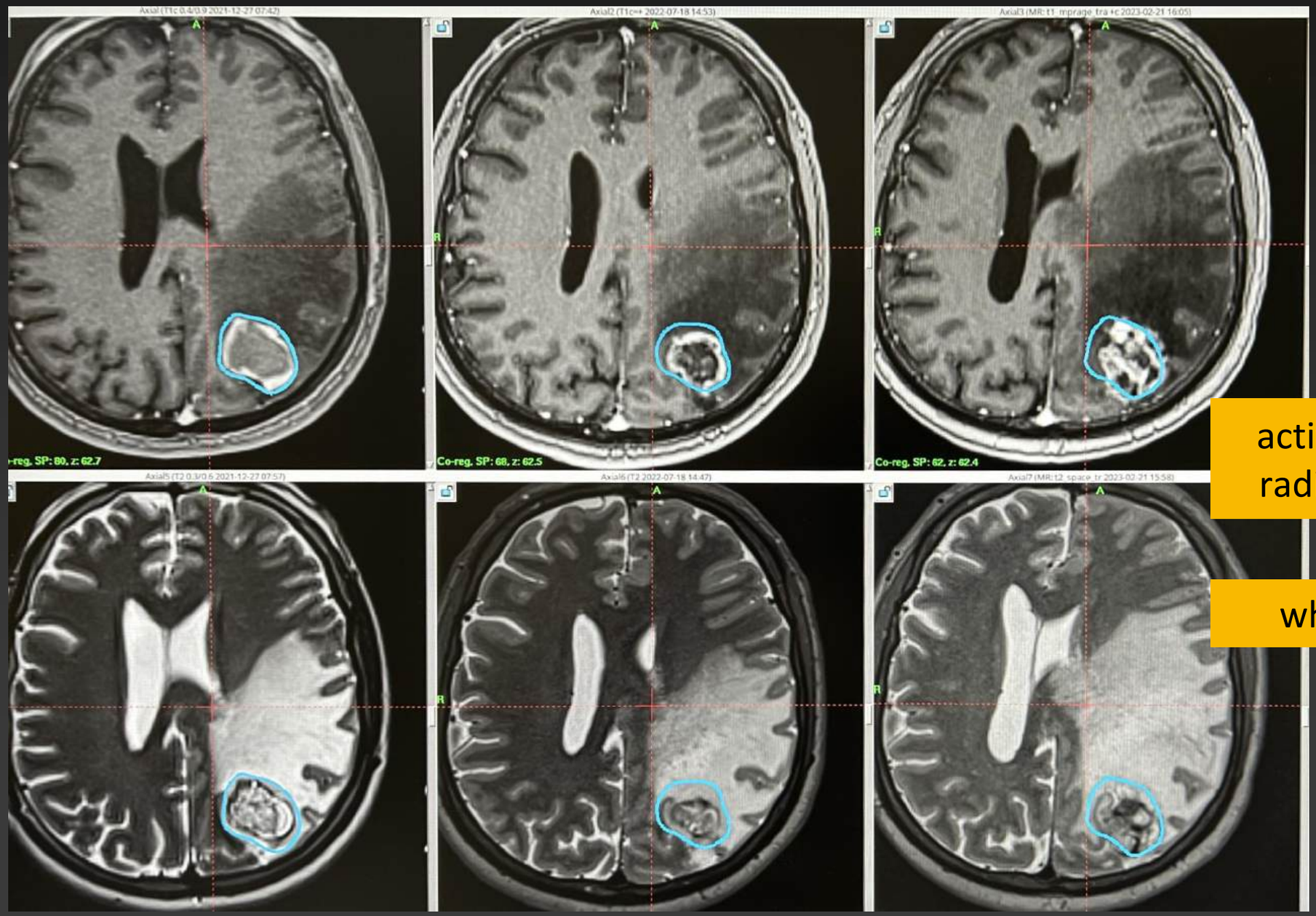


active tumor vs radionecrosis ?

what to do ?

Pathology

METASTASIS

KBC ZAGREB

KLINIČKI ZAVOD ZA PATOLOGIJU I CITOLOGIJU
Medicinskog fakulteta Sveučilišta u Zagrebu
10000 Zagreb, Kišpatićeva 12, tek +385 (1) 2388095
Predstojnik: prof. dr. sc. Marijana Ćorić, dr. med., specijalist patolog

tel. +385(0)1 2388365, fax: +385(0)1 2388060

SVEUČILIŠTE U ZAGREBU MEDICINSKI FAKULTET

NALAZ BIOPSIJE

Broj nalaza: **06362-23**
Primljeno: 23.03.2023
Uputio: NRK - NR4 - KLINIČKA JEDINICA - OPERACIJSKA DVORANA

Odgovoreno: 29.03.2023
Služba/Odjel: ZPA-JPR - ZAVOD ZA PATOLOGIJU REBRO

datum rođenja 30.03.1967,
A, ZAGREB, ZAGREB - DUBRAVA

KLINIČKA DIJAGNOZA: C79.3 - Sekundarna zloćudna novotvorina mozga i moždanih ovojnica;
Dodatak:
Meta cerebri reg P sin
Meta cerebri multiplices
Adenocarcinoma pulmonum
Prima se na Kliniku za neurokirurgiju radi operativnog liječenja zbog klinički i neuroradiološki verificirane metastaze parijetalno lijevo. Do sada više puta provedeno radiokirurško liječenje zametastaze. Kontrolna MR mozga pokazuje daljnju progresiju perifokalnog edema oko velike tretirane metastaze lijevo poarijetalno, sada s izraženijim pomakom struktura preko medijane linije i subfalcinom hernijacijom te umjerenim prioširenjem kalibra ventrikularnog sustava.

MATERIJAL
1. Mozak - tm.cerebri
DTP I: PHL06
DTP II: PHL12

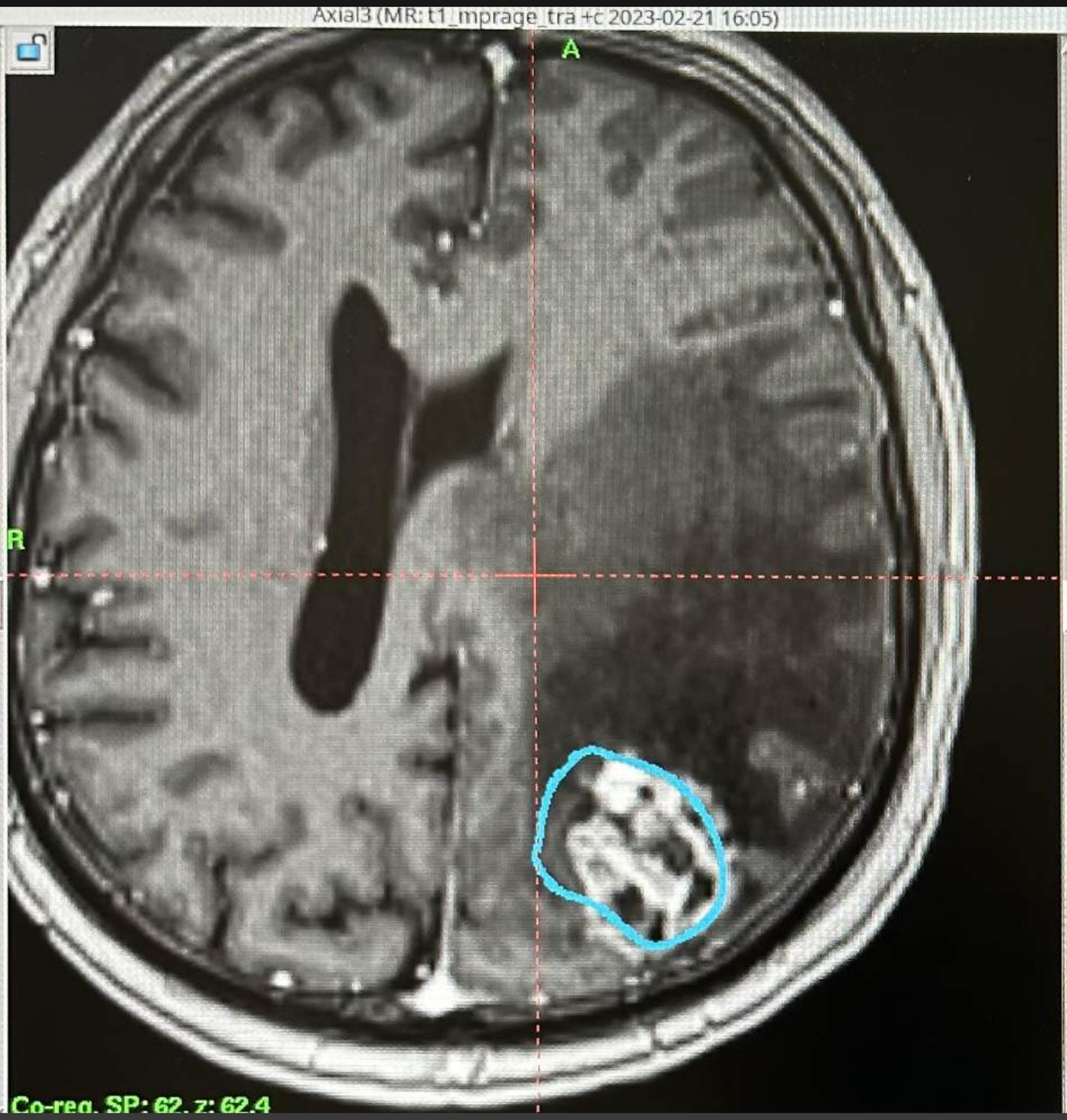
PATOHISTOLOŠKA DIJAGNOZA:
ADENOCARCINOMA METASTATICUM CEREBRI.

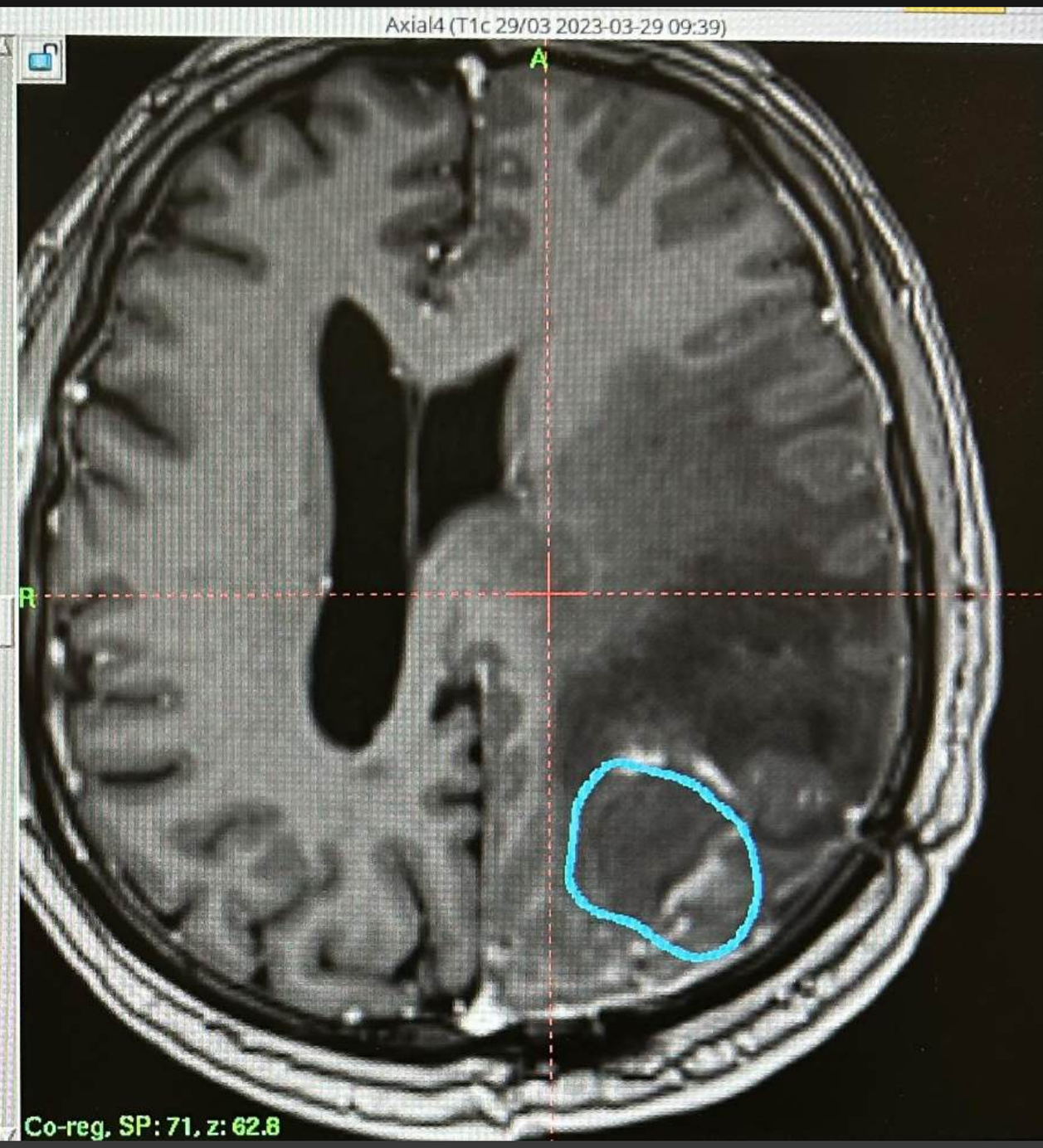
Nalaz i mišljenje

Primljen je nepravilan sivo smeđi komadić tkiva veličine 2,8x2,5x2,6 cm. Histološki nalazi se tumorsko tkivo, većim dijelom nekrotično i prožeto krvarenjem, građeno od solidnih nakupina i dijelom žljezdolikih formacija atipičnih epitelnih stanica koje su CK7+, TTF1+, napsin A+, CD56- i CK5/6-. Uz tumorsko tkivo rubno se nalazi i tkivo mozga.

Opisani nalaz u primljenom i pregledanom materijalu obzirom na kliničke podatke, histološku sliku i imunohistokemijski profil prvenstveno odgovara metastazi adenokarcinoma pluća.

Postoperative MRI





Further treatment ?

- tapering of dexamethasone
- GKRS vs fractionated WBRT ?

9TH CONGRESS OF THE CROATIAN NEUROSURGICAL SOCIETY

& Joint Meetings with the **German Society of Neurosurgery** and **Czech Neurosurgical Society** & **Croatian-Japanese Special CSF Symposium**

save the date

12 – 15 October 2023

Fortis Congress center, Petrčane, Croatia

Technical organization:
VIVID ORIGINAL Ltd.
Contact: Goran Grbić
M +385 98 1706 028
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