

Meningiomas

**Radiotherapy
Chemotherapy
Clinical Trials**

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Overview

§ Radiation for meningiomas

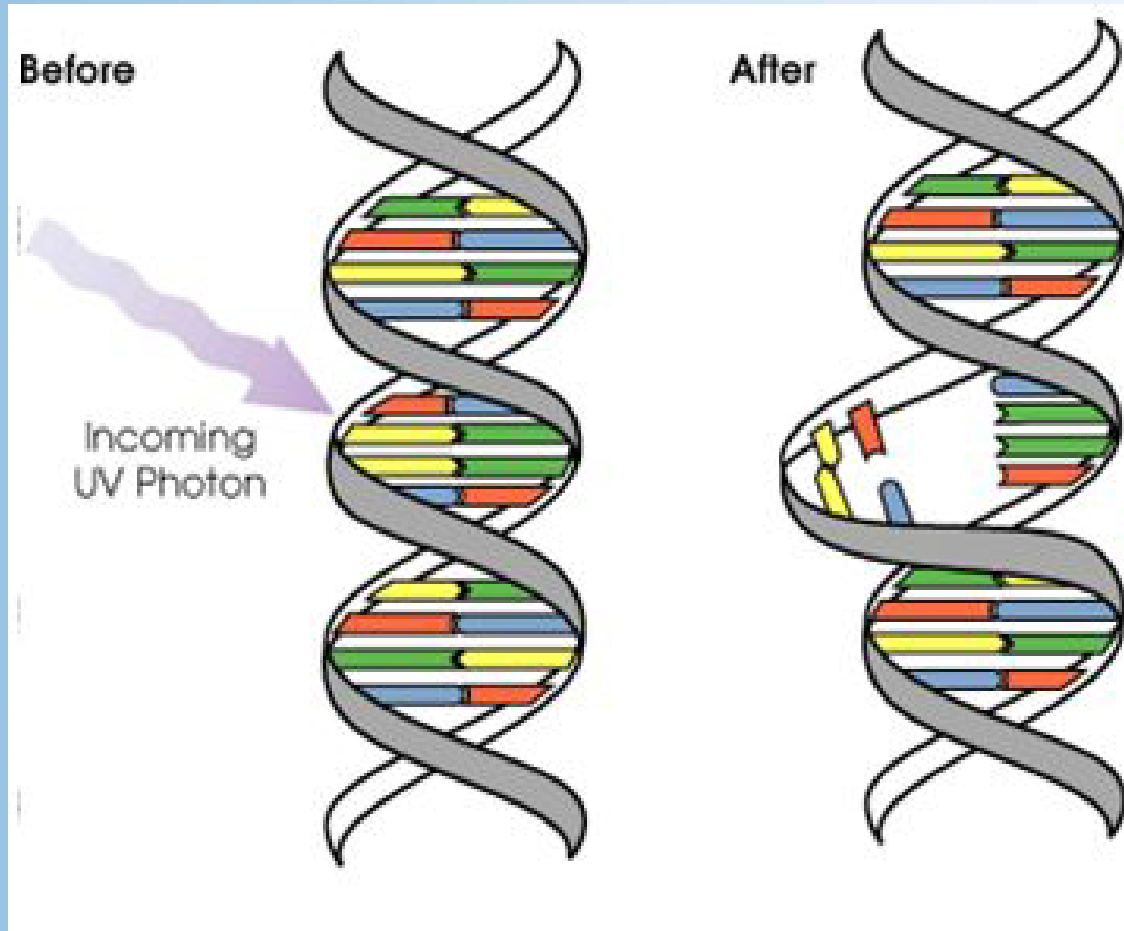
- When is it necessary?
- How is it done?

§ Chemotherapy for meningiomas

- Current treatments
- What's on the horizon

Radiotherapy

§ How it works

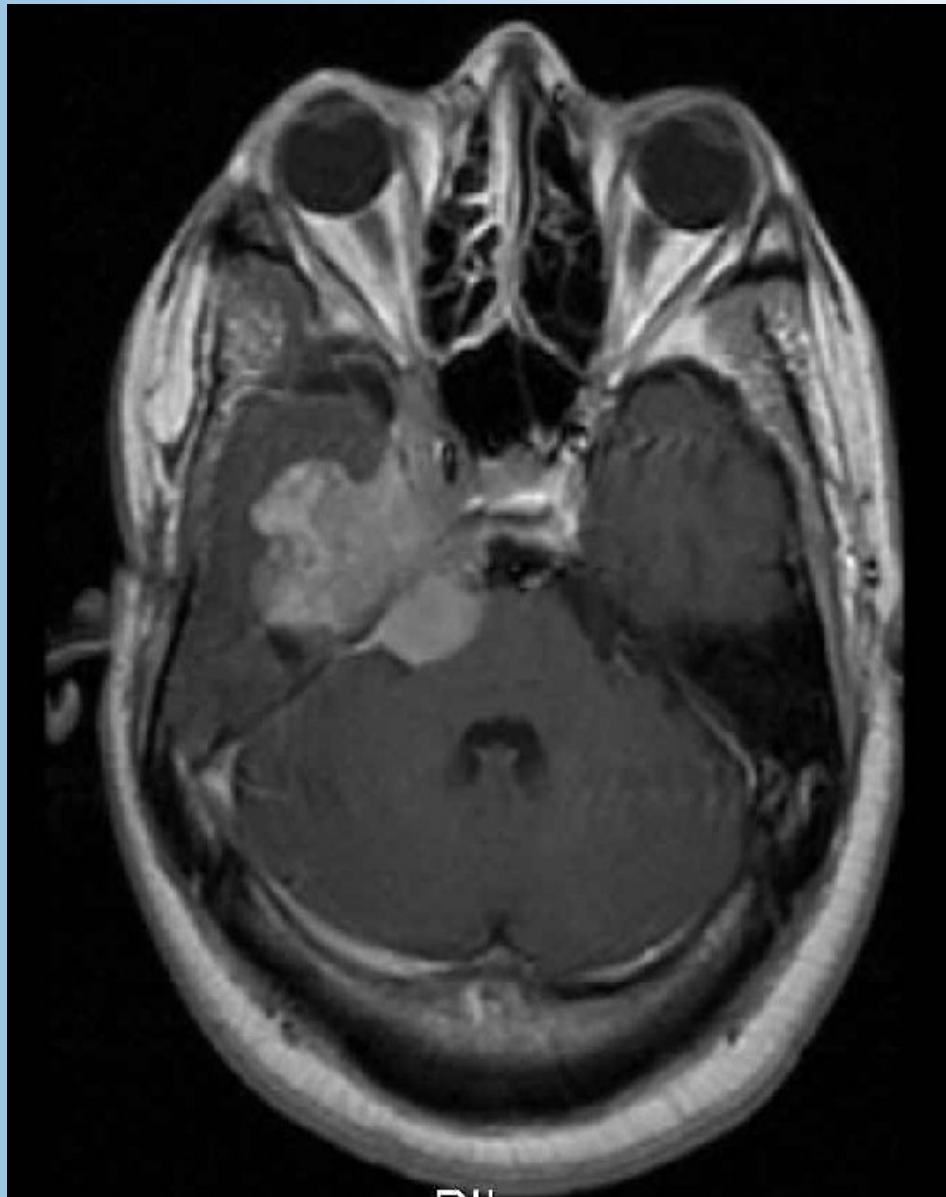


Radiotherapy

§ When is it used

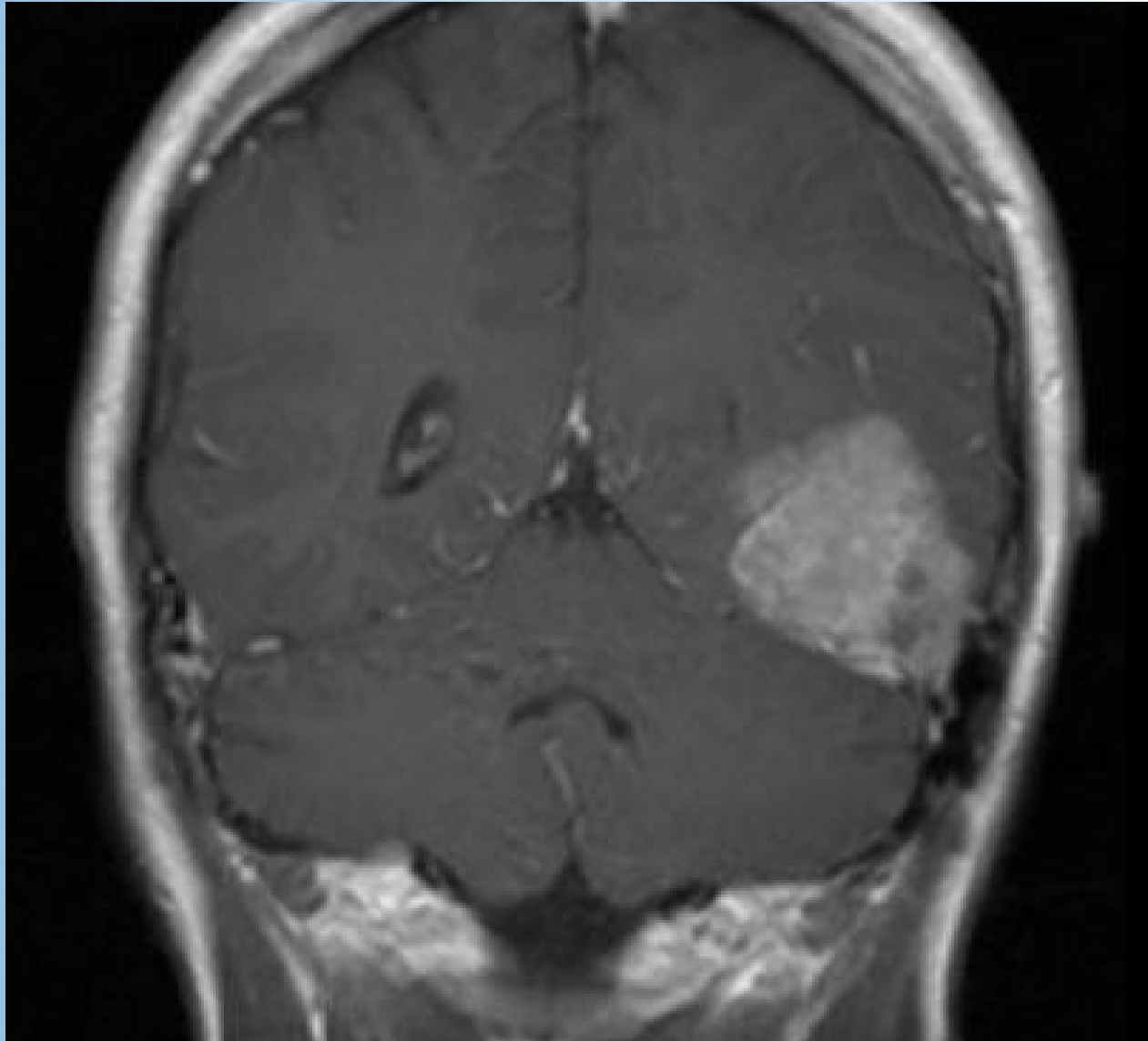
- Inoperable -- medically or surgically
- After surgery for incompletely resected or high grade tumors
- Recurrent tumors after previous surgery
- Co-existing medical problems or patient preference

Inoperable

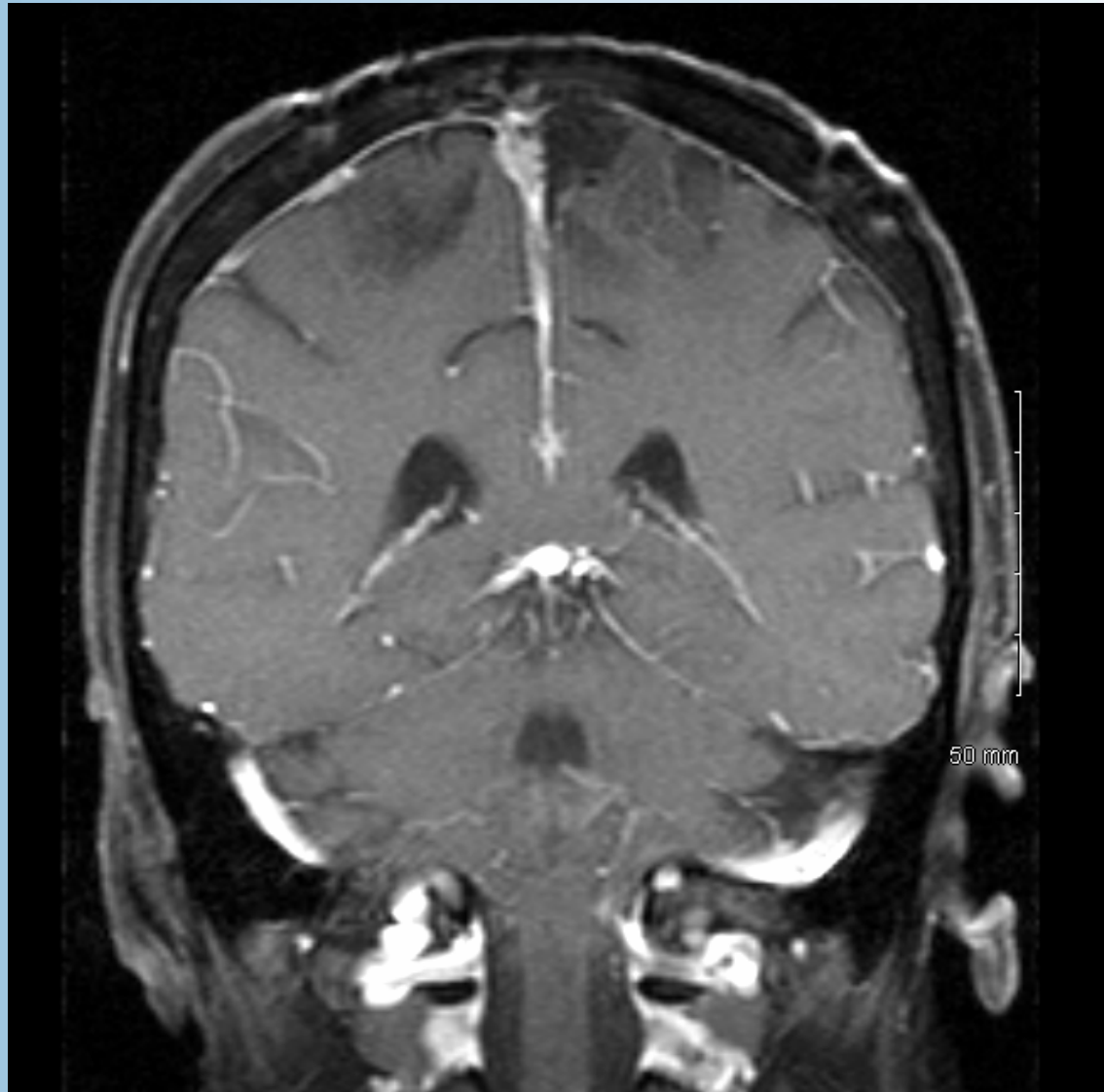


P11

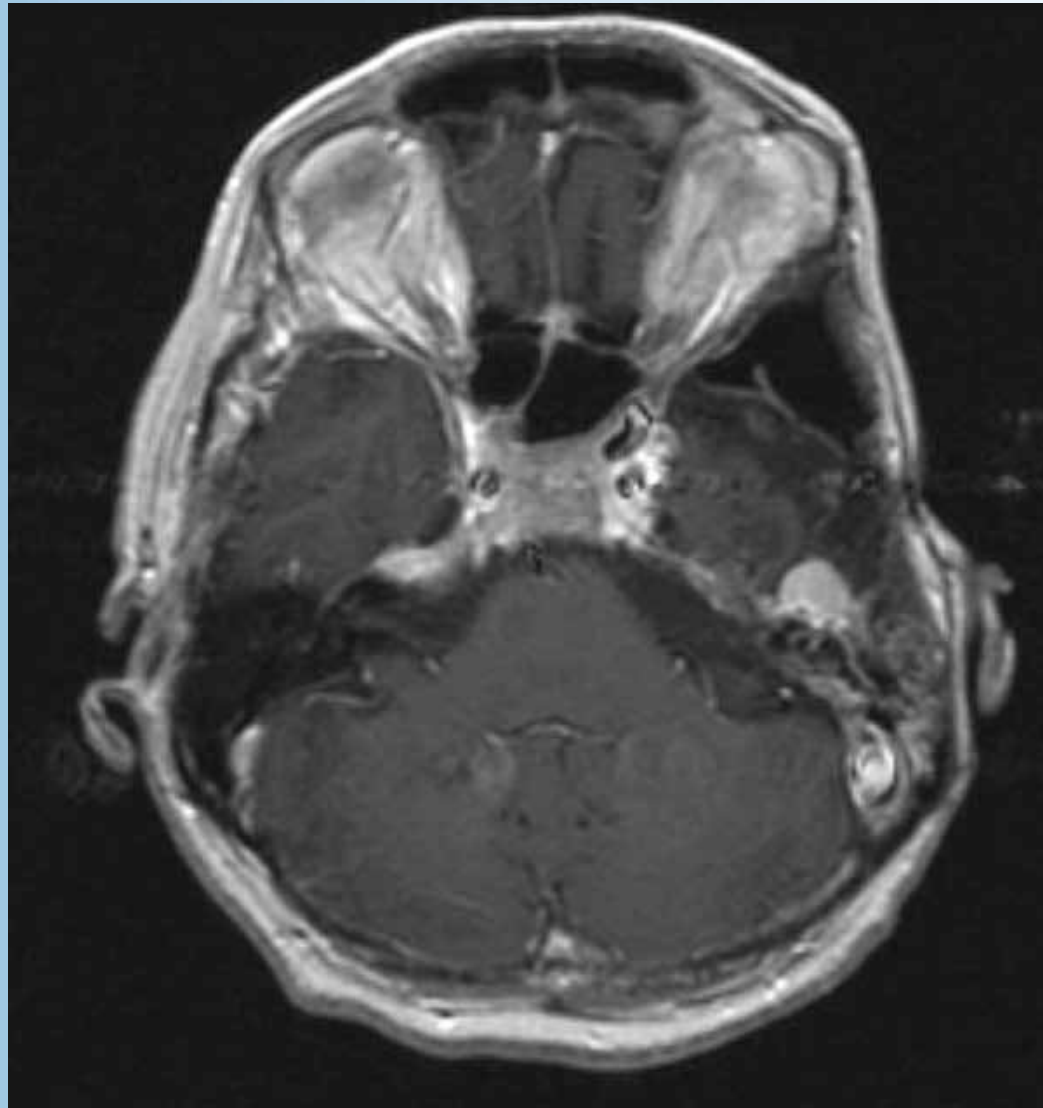
High Grade Tumor



Incomplete Resection



Recurrent Tumor



Co-existing Medical Problems



Radiotherapy Techniques



Conventional Radiotherapy

§ IMRT, DCA, 3D Conformal

Novalis Treatment Planning 5.2 © 1989/2002 by BrainLAB AG
File Edit Calculations AutoContour Settings Therapy Info

Isocenter
Store Select
Add... Remove
Pos. Isoc. O. Coll.
A-P : -0.35
Lat. : 20.03
Vert. : -20.43
Dose: 20.00
Margin: 0.0

Arc Plane
Select
Add Remove
Position Table
Start Stop
Split O. Coll.
Table: 330
Start: 230
Stop: 350
Coll.: 90
Dose: 4.00
Margin: 0.0

Dose Display
 Isodoses
 Dose Wash
 Thresh. Dose

Dosimetry
Normal Point
Parameters...
 Pencil Beam

Object
3D Database
 Fill Contours
Copy Delete
Draw

Main Window
 1 Image
 4 Images
 9 Images
 16 Images
 3D Display
 Arc Plane
 Beam's Eye

Tissue
 Split Screen
In Out
MR axial set #1
Prior Next

Options
 Reconstruct.
 Multiplanar
 Multiple Sets
 Other Views
Catalog
 Sketches
 3D Overview
In Out

radiosurgery

Nevalis Treatment Planning 5.2 © 1989/2002 by BrainLAB AG

File Edit Calculators AutoContour Settings Therapy Info

Isocenter

Store	Select
Add...	Remove
Pos. Inac	O. Coll.
A-P :	-0.35
Lat. :	20.03
Vert. :	-70.43
Dose :	20.00
Margin :	0.0

Arc Plane

Select	
Add	Remove
Position Table	
Start	Stop
Split	O. Coll.
Table :	70
Start :	30
Stop :	140
Coll. :	90
Dose :	4.00
Margin :	0.0

Dose Display

Isodoses
 Dose Wash
 Thresh. Dose

Dosimetry

Normal, Point
Parameters...
 Pencil Beam

0°

180°

CORONAL 693 MU

Arc 1 R

Slice no. 17

AXIAL

100.0 % = 20.00 Gy

8.00 Gy
10.00 Gy
12.00 Gy
15.00 Gy

Object

3D Database
 Fill Contours
Copy Delete
Draw

Main Window

1 Image
 4 Images
 9 Images
 16 Images
 3D Display
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 Tissue
 Split Screen

In Out

MR axial set #1

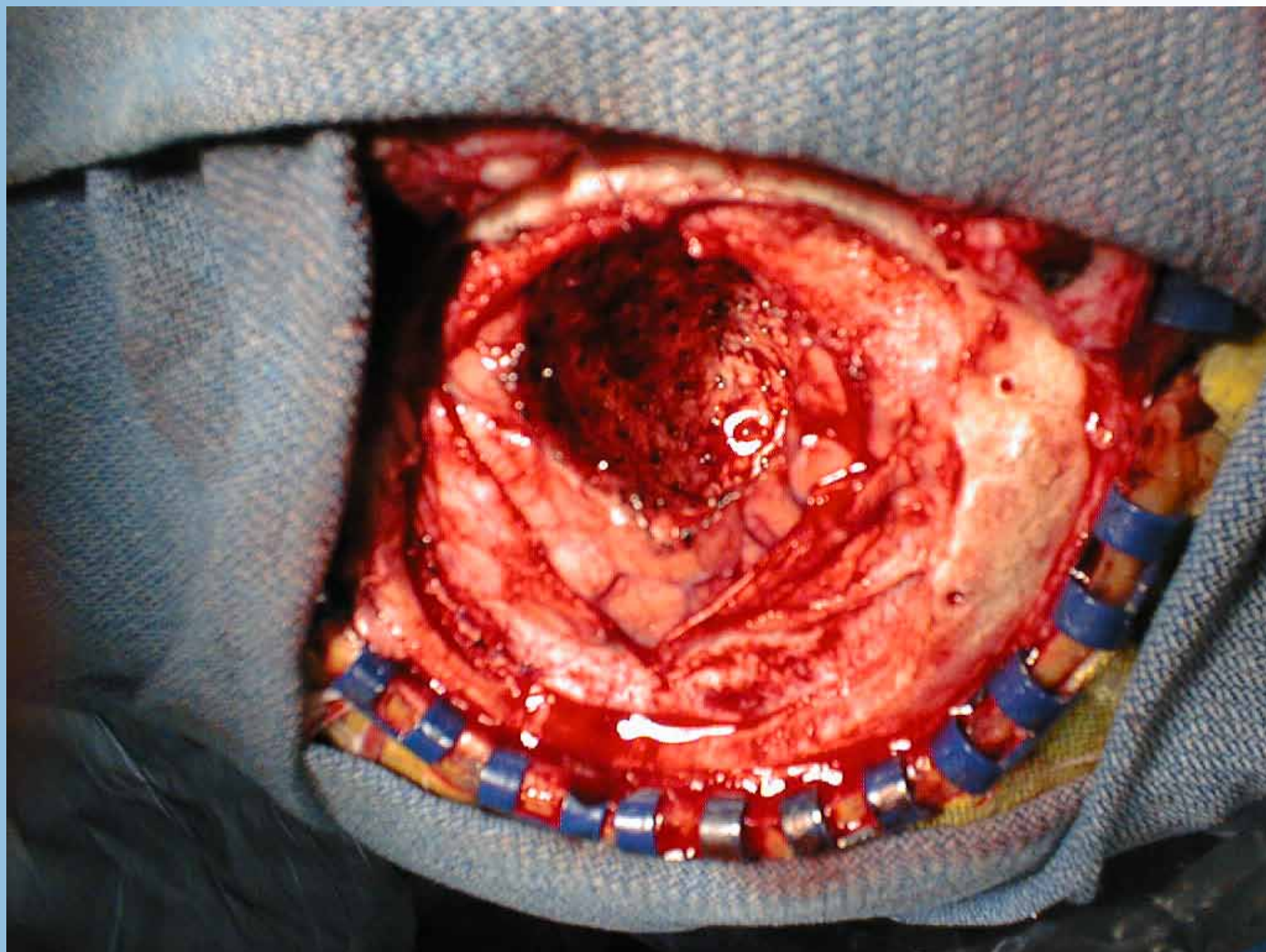
Print Next

Options

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† BrainLAB Novalis 5.2



Treatment results with RT

*Compiled series allowing for comparison in the rates of PFS for patients treated with GTR, STR, or with STR plus EBRT **

Authors & Year	No. of Patients	FU (mos)	5-yr PFS (%)		
			GTR	STR	STR & EBRT†
Adegbite et al., 1983	114	10–276	90	45	82
Mirimanoff et al., 1985	225	>60 (65%)	93	63	
Barbaro et al., 1987	135	78	96	60	80
Taylor et al., 1988	132	>60 (60%)	96	43	85
Glaholm et al., 1990	117	80			84
Miralbell et al., 1992	115	57		48	88 (8-yr PFS)
Goldsmith et al., 1994	117	40			89 (98 after 1980)
Mahmood et al., 1994	254	61	98	54	
Peele et al., 1996	86	46		52	100
Condra et al., 1997	246	98	95	53	86
Stafford et al., 1998	581	55	88	61	
Maguire et al., 1999	28	41			92 (4-yr PFS)
Nutting et al., 1999	82	108			92
Vendrely et al., 1999	156	40			89
Wenkel et al., 2000	46	53			100
Debus et al., 2001	189	35			98 (FSRT)
Dufour et al., 2001	31	73			93 (10-yr PFS)
Pourel et al., 2001	26	30			95
Uy et al., 2002	40	30			93
Pirzkall et al., 2003	20	36			100
Selch et al., 2004	45	36			98 (3-yr PFS)
Soyuer et al., 2004	92	92	77	38	91
Milker-Zabel et al., 2007	94	53			93.6 (Grade I 96.3)

What Radiotherapy May Not Do

§ **Shrink meningiomas**

§ **Reverse damage previously done by tumor**

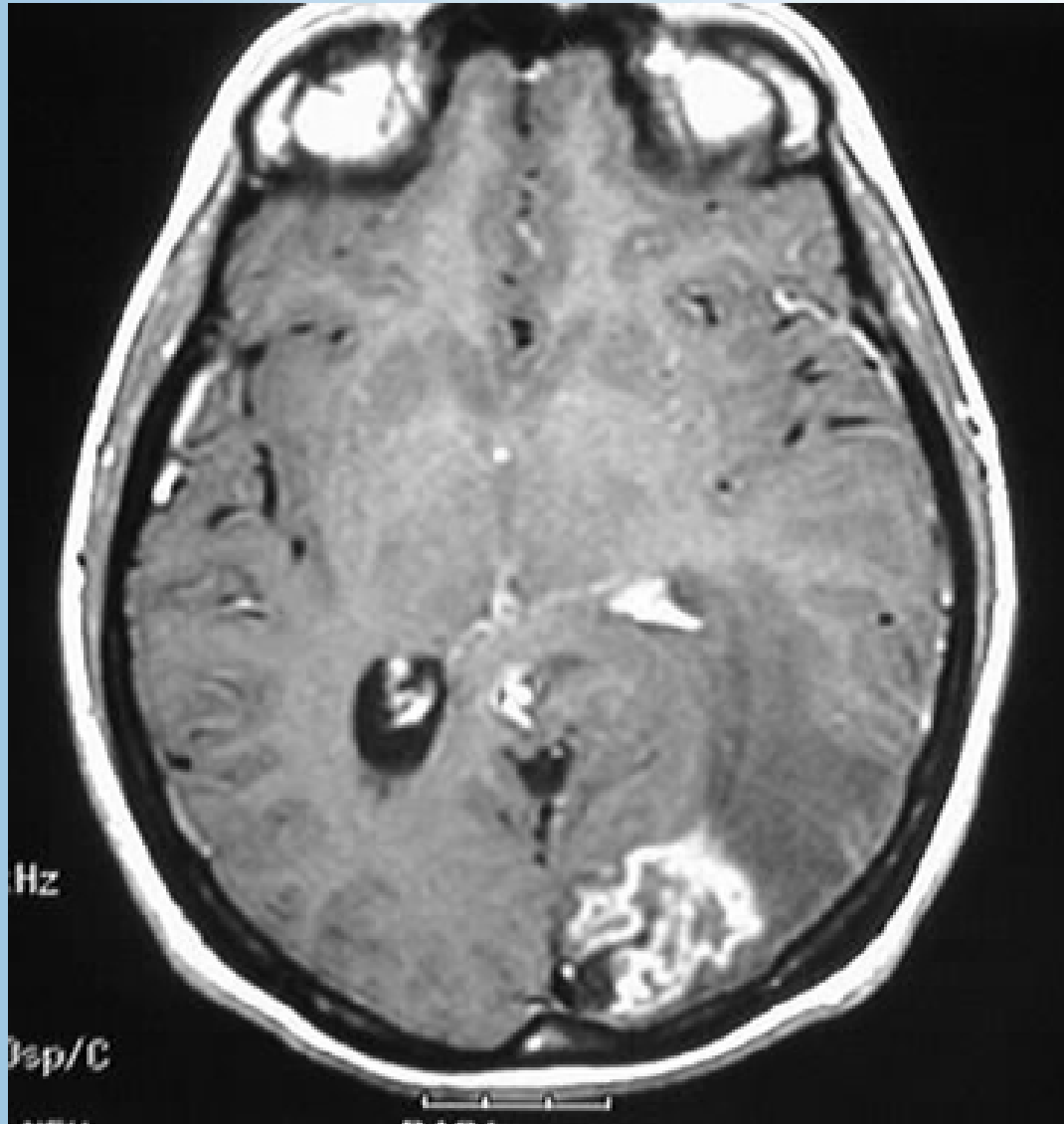
Risks and side effects



Fatigue



Hair Loss



Necrosis

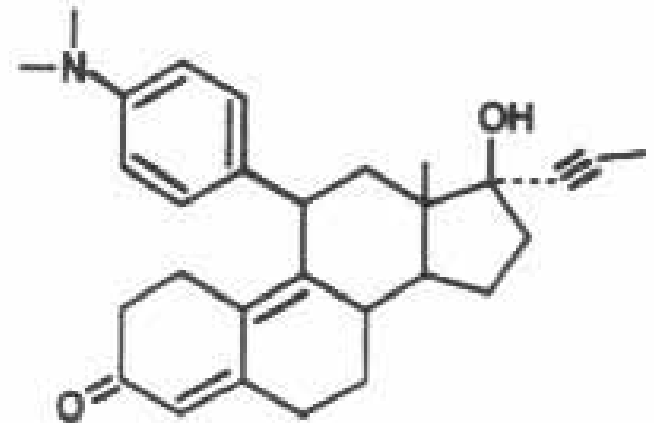
Chemotherapy

§ Hydroxyurea



Hormone Therapy

Progesterone Sandostatin

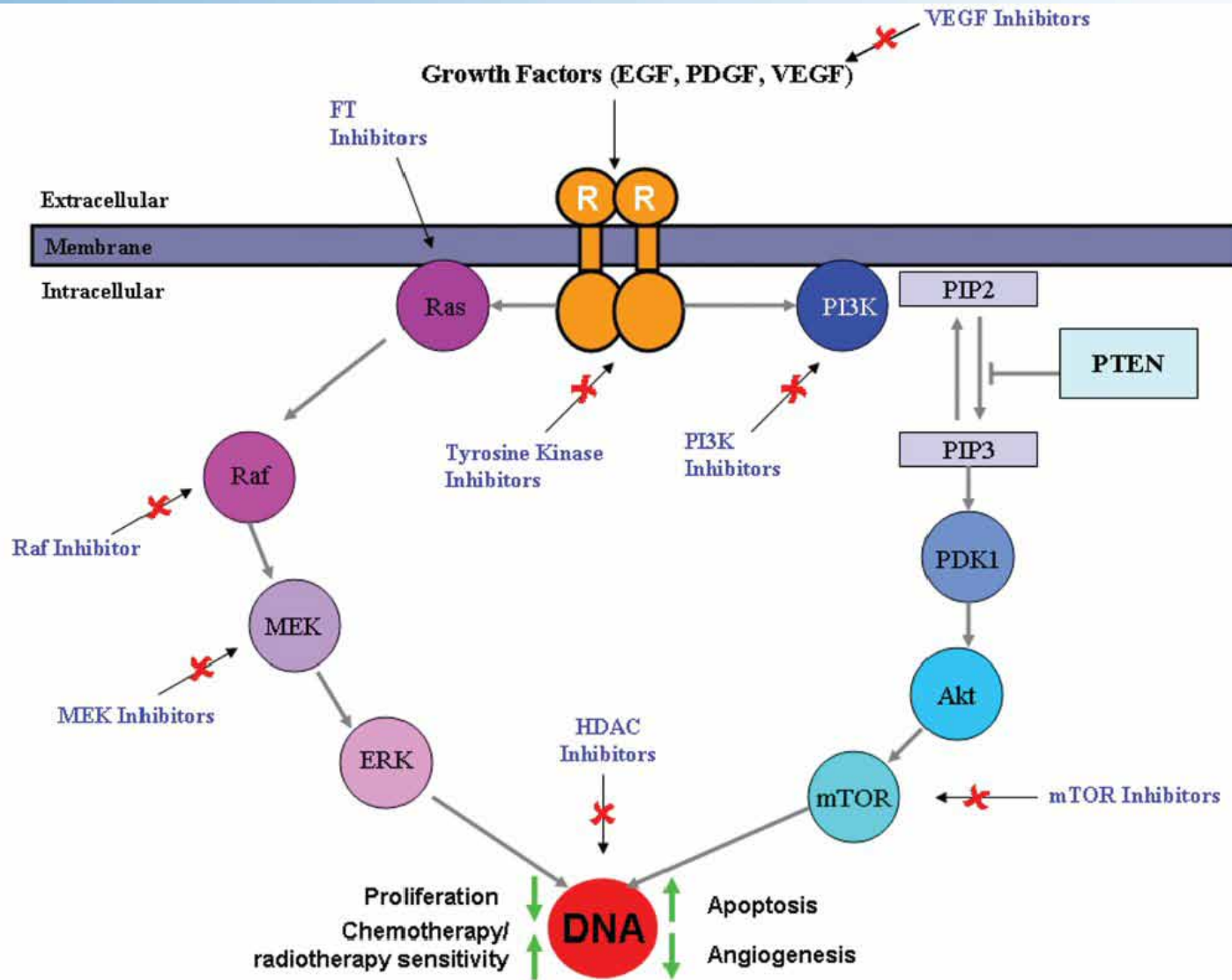


Immunotherapy

§ Interferon



Biologic Therapies



Clinical Trials

- § **Antineoplastic Therapy in Treating Patients With Brain Tumors**
- § **Trial of the Combination of Bevacizumab and Everolimus in Patients With Refractory, Progressive Intracranial Meningioma**
- § **Phase II Study of Imatinib Mesylate and Hydroxyurea in Patients With Recurrent or Progressive Meningioma**
- § **Vatalanib in Treating Patients With Recurrent or Progressive Meningioma**
- § **Phase II Study of Sunitinib Malate in Patients With Recurrent or Unresectable Meningioma, Intracranial Hemangiopericytoma, or Intracranial Hemangioblastoma**
- § **Combination of Hydroxyurea and Verapamil for Refractory Meningiomas**
- § **Monthly SOM230C for Recurrent or Progressive Meningioma**

Conclusions

- § **Radiotherapy is effective for halting the growth of meningiomas**
- § **Radiotherapy will sometimes improve symptoms caused by meningiomas**
- § **Current medical therapy is sub-optimal, though there are promising new drugs on the horizon**

Questions