

Case 1: MJ

66 y o

Hx of progressive diplopia, post viral infection 10 y ago - resolved

Recurrence of diplopia 7 y a, post viral infection
c/o Double vision mainly when tired,
he can control sometimes.

No associated trauma/ no pain

No headaches, nausea or vomiting, hearing problems, loss of appetite, weight loss, jaw claudication, joints pain

MJ

POHx normal as a child

PMHx:

PAF

Hypercholesterolemia

Asthma

Sinus problems

Past trauma:

fell, forehead sutured- 17yo

Nose fracture- 30yo

MJ -Check up

BCVA: re 6/4cc le 6/5cc

IOP: 18/18

C-T sc (N) LT HyperT 25 pd LT XT -30 PD

sc (D) LT HyperT 20 pd LT XT -30 PD

(Mildly elevated ▲ compared to first visit in OMC 6 m ago)

25		18	
25-30-20	XT	18-14-16	LH
25		14	

OM: LSO 2- LIO 2+ → LT CN IV palsy



MJ

SACCADES Normal

Negative CL TWITCH , lid lag, Fatigue

Orbicularis Oculi - Normal

No proptosis (not in valsalva)

sensitivity to light - 90% on the Le.

Ishihara – N (slower on LE)

Normal VF, red desaturation,

Slit lamp: BE normal anterior chambers

Fd: BE normal discs, LE – excyclotorted macula

MJ-laboratory

- ESR, CPR- N
- CBC - N
- anti-thyroid peroxidase Ab's - Neg,
- anti thyro-globulin Ab's - Neg,
- anti TSH-rec Ab's - Neg

MJ

- MRI (2009):
 - SOM atrophy
 - LT Large maxillary polyp

MRI brain & orbits w Contrast (18/2/11)



T1 coronal

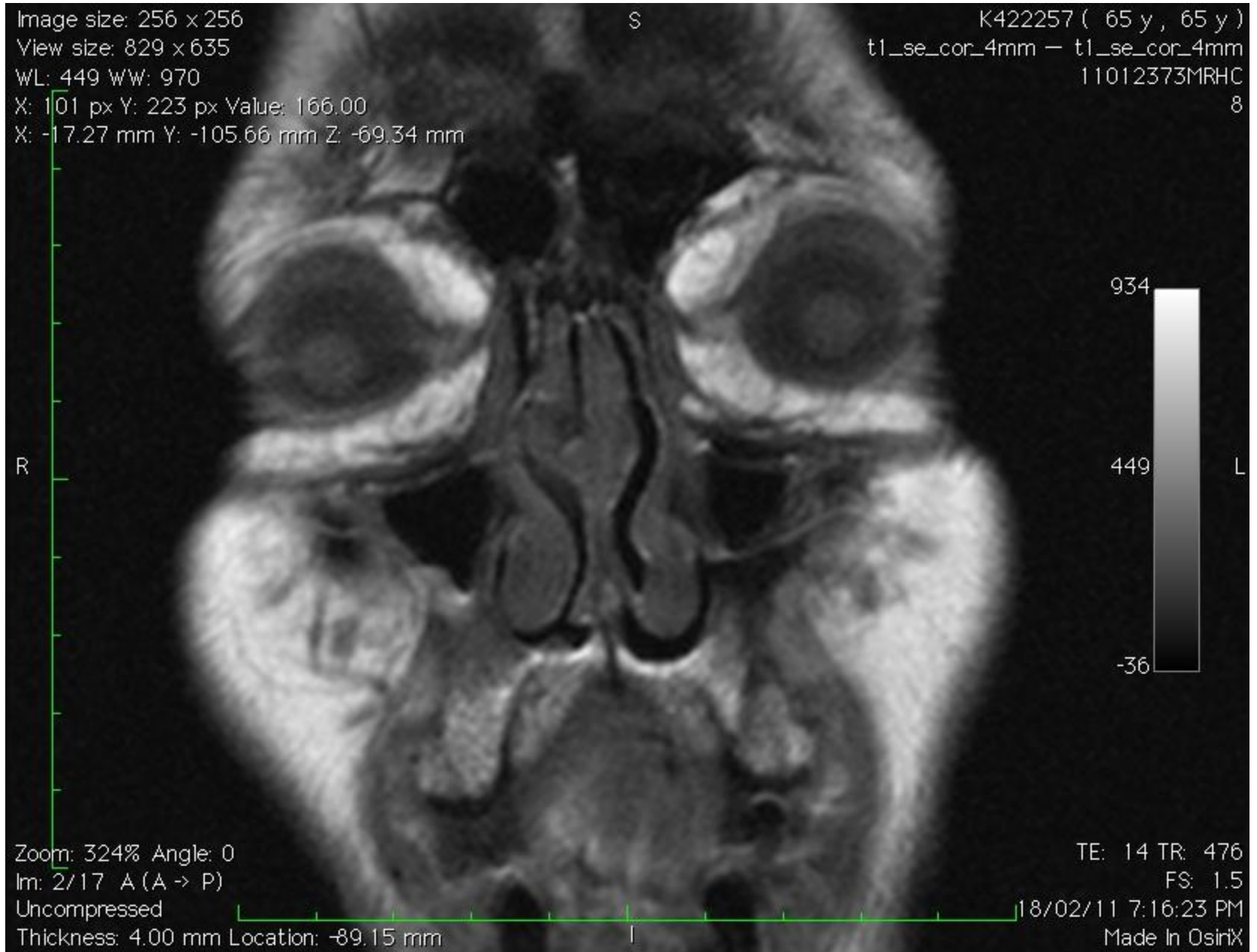


Image size: 256 x 256

View size: 829 x 635

WL: 449 W'W: 970

X: 101 px Y: 223 px Value: 48.00

X: -16.92 mm Y: -100.89 mm Z: -69.75 mm

S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8

R

934

449

L

-36

Zoom: 324% Angle: 0

Im: 3/17 A (A -> P)

Uncompressed

Thickness: 4.00 mm Location: -84.38 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsiriX

Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 42.00

X: -16.56 mm Y: -96.12 mm Z: -70.15 mm

S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8

R

934

449

L

-36

Zoom: 324% Angle: 0

Im: 4/17 A (A -> P)

Uncompressed

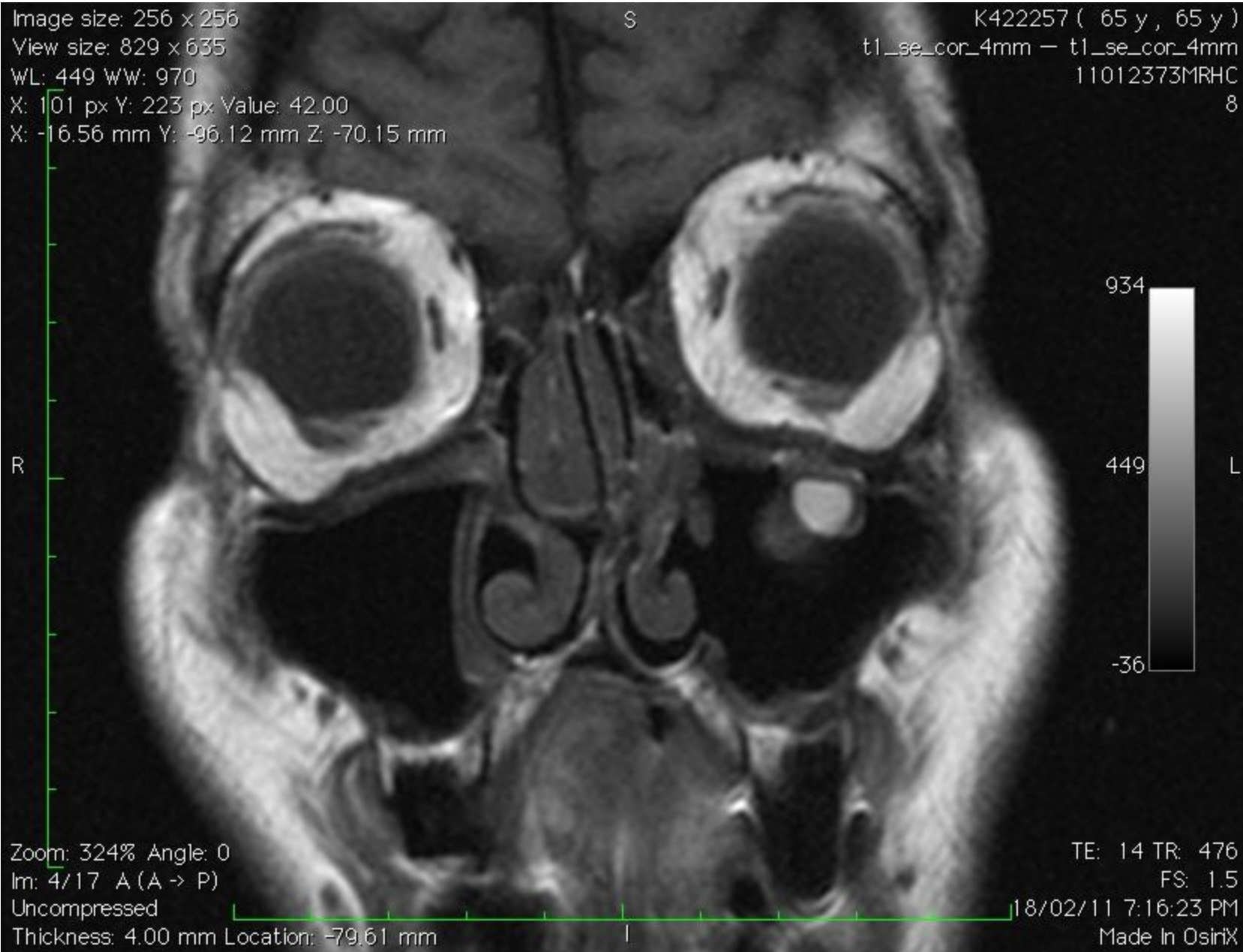
Thickness: 4.00 mm Location: -79.61 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsiriX



LSO atrophy



LSO atrophy



Image size: 256 x 256
View size: 829 x 635
WL: 449 WW: 970
X: 101 px Y: 223 px Value: 106.00
X: -15.49 mm Y: -81.81 mm Z: -71.38 mm

S

K422257 (65 y , 65 y)
t1_se_cor_4mm - t1_se_cor_4mm
11012373MRHC
8

R

L



Low T1
LE mass
lesion,
in post
orbit

Zoom: 324% Angle: 0
Im: 7/17 A (A → P)
Uncompressed
Thickness: 4.00 mm Location: -65.30 mm

TE: 14 TR: 476
FS: 1.5
18/02/11 7:16:23 PM
Made In OsiriX

Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 333.00

X: -14.78 mm Y: -72.27 mm Z: -72.19 mm

S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8

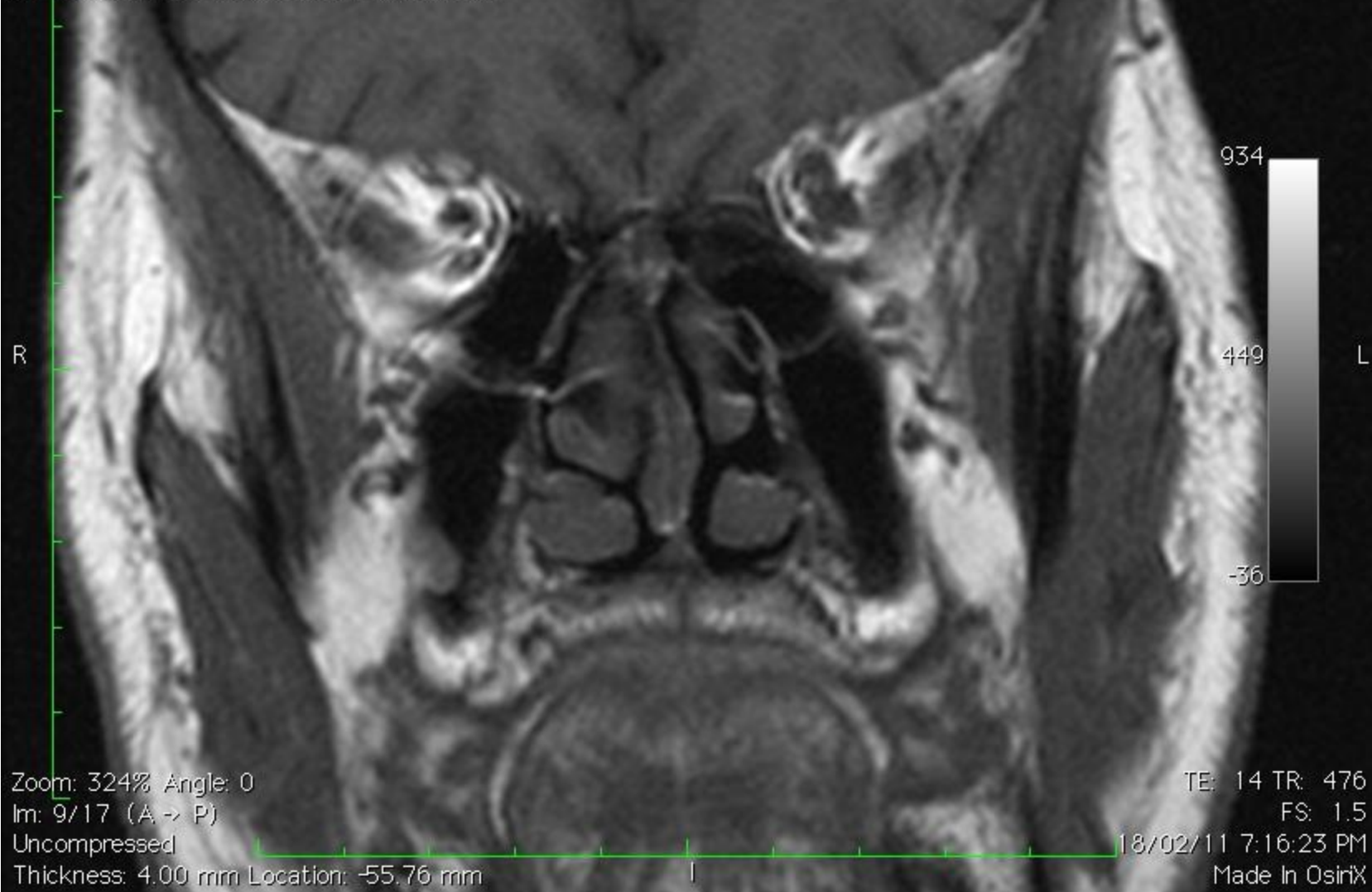


Image size: 256 x 256

S

K422257 (65 y , 65 y)

View size: 829 x 635

t1_se_cor_4mm - t1_se_cor_4mm

WL: 449 WW: 970

11012373MRHC

X: 101 px Y: 223 px Value: 226.00

8

X: -14.42 mm Y: -67.50 mm Z: -72.60 mm

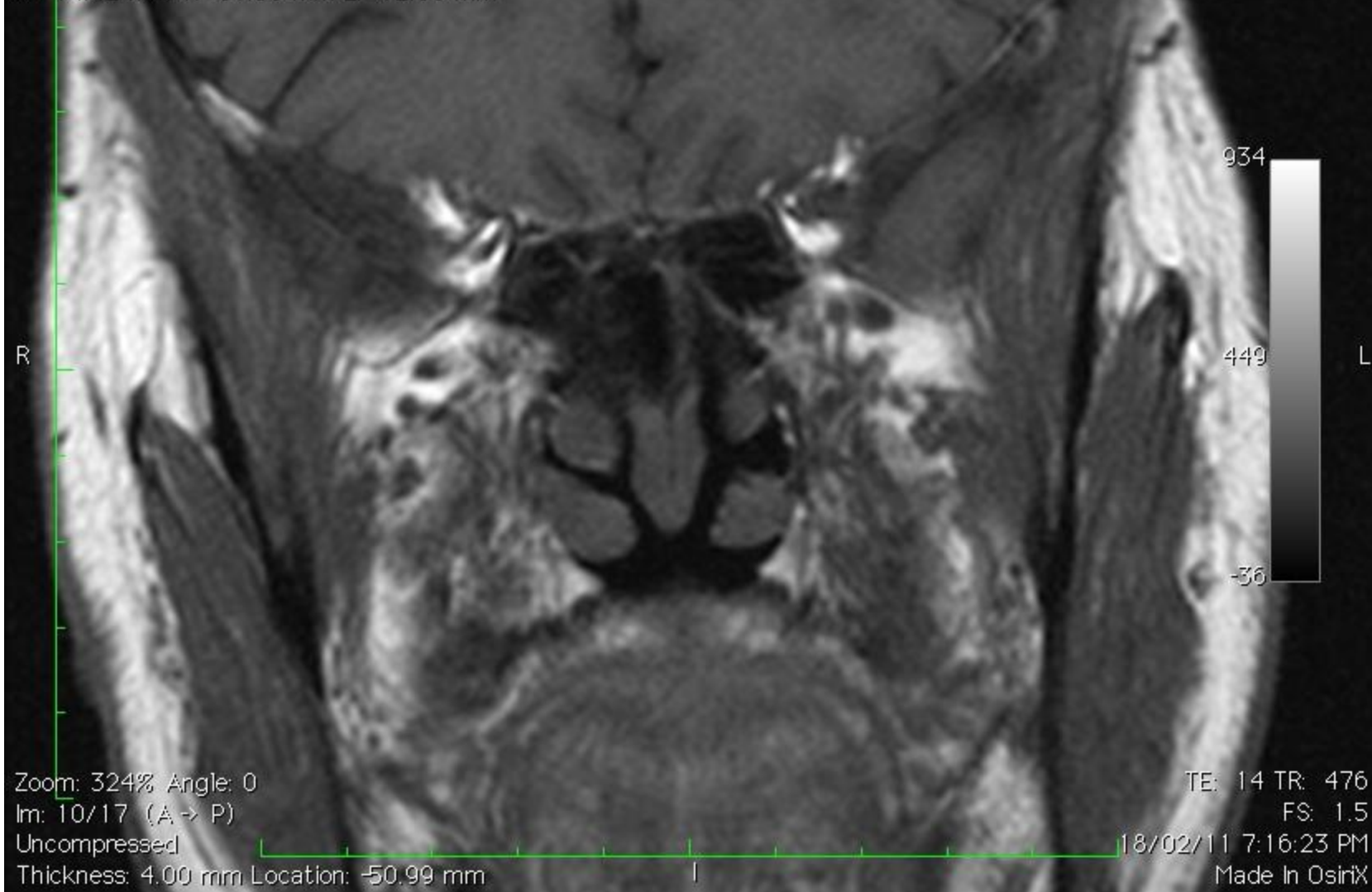


Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 267.00

X: -14.07 mm Y: -62.73 mm Z: -73.01 mm

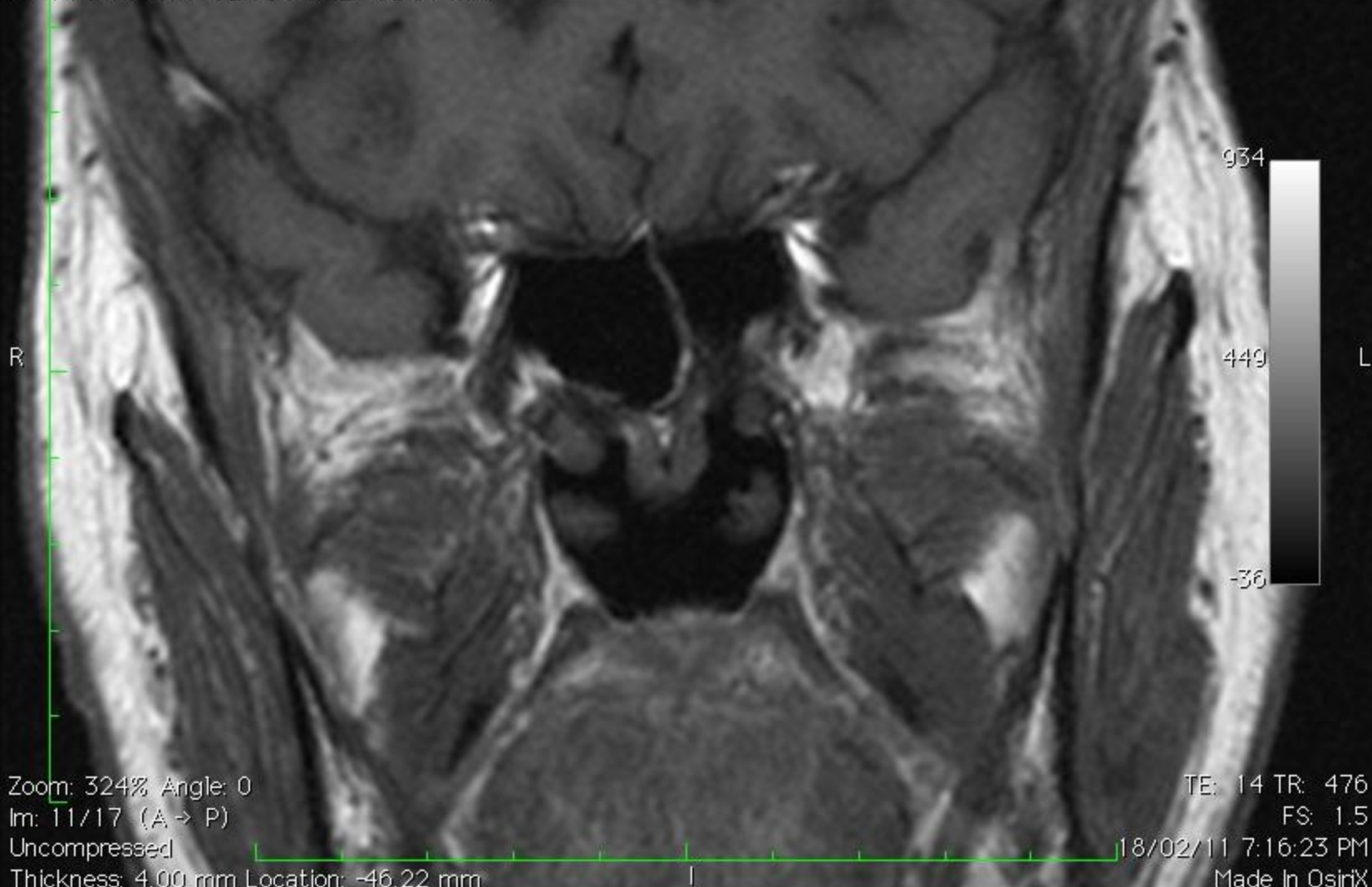
S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8



Zoom: 324% Angle: 0

Im: 11/17 (A -> P)

Uncompressed

Thickness: 4.00 mm Location: -46.22 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsiriX

Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 247.00

X: -13.71 mm Y: -57.97 mm Z: -73.42 mm

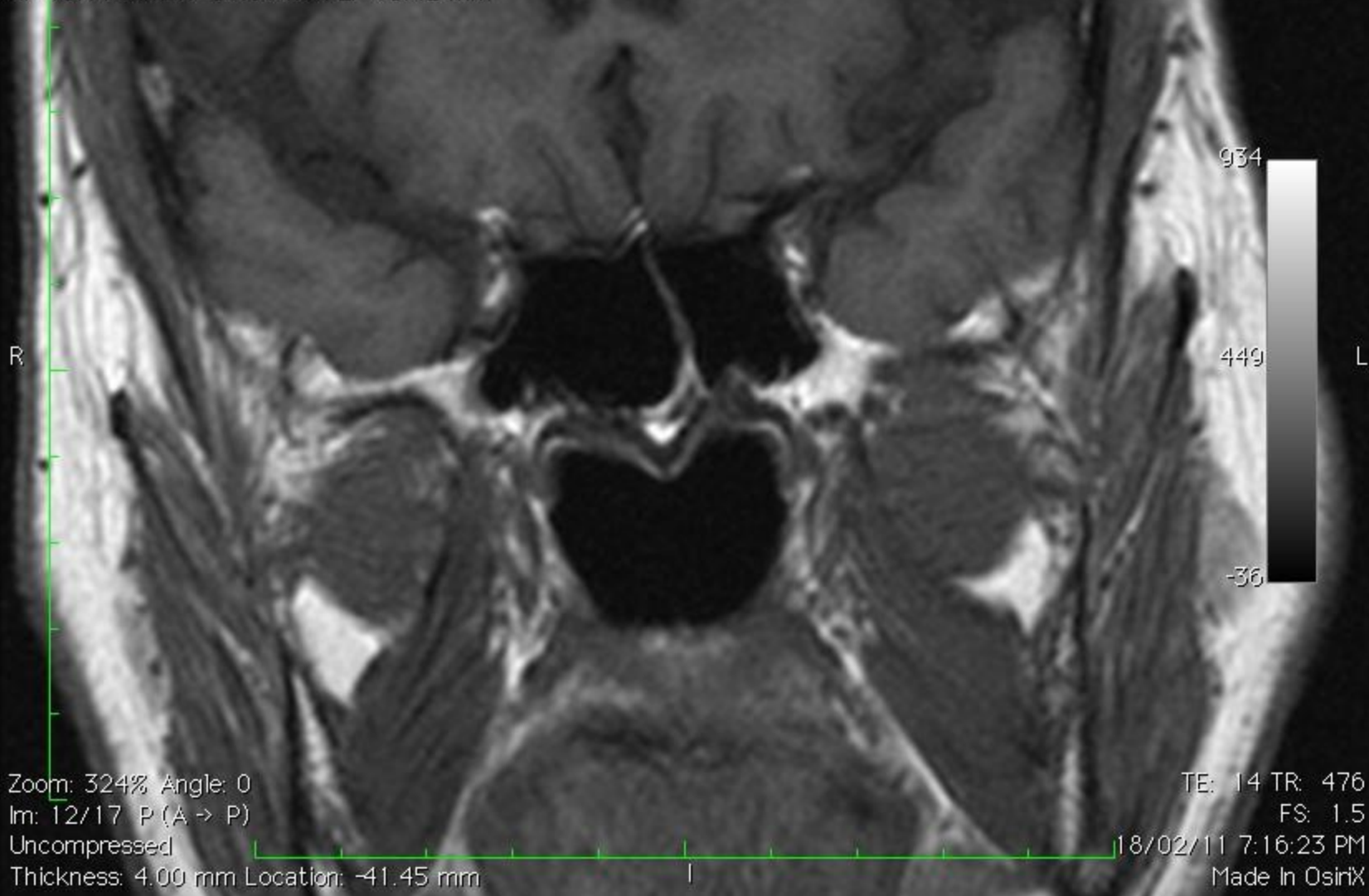
S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8



R

L

934

449

-36

Zoom: 324% Angle: 0

Im: 12/17 P (A -> P)

Uncompressed

Thickness: 4.00 mm Location: -41.45 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsiriX

Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 184.00

X: -13.35 mm Y: -53.20 mm Z: -73.82 mm

S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8

R

934

449

L

-36

Zoom: 324% Angle: 0

Im: 13/17 P (A -> P)

Uncompressed

Thickness: 4.00 mm Location: -36.68 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsirX

Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 193.00

X: -13.00 mm Y: -48.43 mm Z: -74.23 mm

S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8

R

934

449

L

-36

Zoom: 324% Angle: 0

Im: 14/17 P (A -> P)

Uncompressed

Thickness: 4.00 mm Location: -31.91 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsiriX

Image size: 256 x 256

View size: 829 x 635

WL: 449 WW: 970

X: 101 px Y: 223 px Value: 193.00

X: -13.00 mm Y: -48.43 mm Z: -74.23 mm

S

K422257 (65 y , 65 y)

t1_se_cor_4mm - t1_se_cor_4mm

11012373MRHC

8

934

449

-36

R

L

Zoom: 324% Angle: 0

Im: 14/17 P (A -> P)

Uncompressed

Thickness: 4.00 mm Location: -31.91 mm

TE: 14 TR: 476

FS: 1.5

18/02/11 7:16:23 PM

Made In OsiriX

T2 CORONAL



Image size: 384 x 512
View size: 1141 x 635
WL: 276 WW: 638
X: 129 px Y: 332 px Value: 213.00
X: -32.48 mm Y: -102.79 mm Z: -49.01 mm

S

K422257 (65 y , 65 y)
T2 Cor HI Res_FS — T2 Cor HI Res_FS
11012373MRHC
9

R

595

276

-43

Zoom: 396% Angle: 0
In: 2/17 A (A -> P)
Uncompressed
Thickness: 4.00 mm Location: -83.61 mm

TE: 72 TR: 3300
FS: 1.5
18/02/11 7:18:30 PM
Made In OsirX



384 x 512
141 x 635
/: 638
332 px Value: 355.00
m Y: -98.02 mm Z: -49.42 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(A -> P)
ed
.00 mm Location: -78.84 mm

TE: 1
18/02/11
M



384 x 512
141 x 635
/: 638
332 px Value: 238.00
m Y: -93.25 mm Z: -49.83 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(A → P)
ed
.00 mm Location: -74.07 mm

TE: 1
18/02/11
M



384 x 512
141 x 635
/: 638
332 px Value: 256.00
m Y: -88.48 mm Z: -50.24 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(A → P)
ed
.00 mm Location: -69.30 mm

TE: 7
18/02/11
M



384 x 512
141 x 635
/: 638
332 px Value: 78.00
m Y: -83.71 mm Z: -50.64 mm

K422257 (6
T2 Cor Hf Res_FS - T2 C
110

Angle: 0
(A -> P)
ed
.00 mm Location: -64.53 mm

TE: 7
18/02/11
M



High signal T2



384 x 512
141 x 635
/ 638
332 px Value: 227.00
m Y: -74.17 mm Z: -51.46 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(, -> P)
ed
.00 mm Location: -54.99 mm

TE: T
18/02/11
M

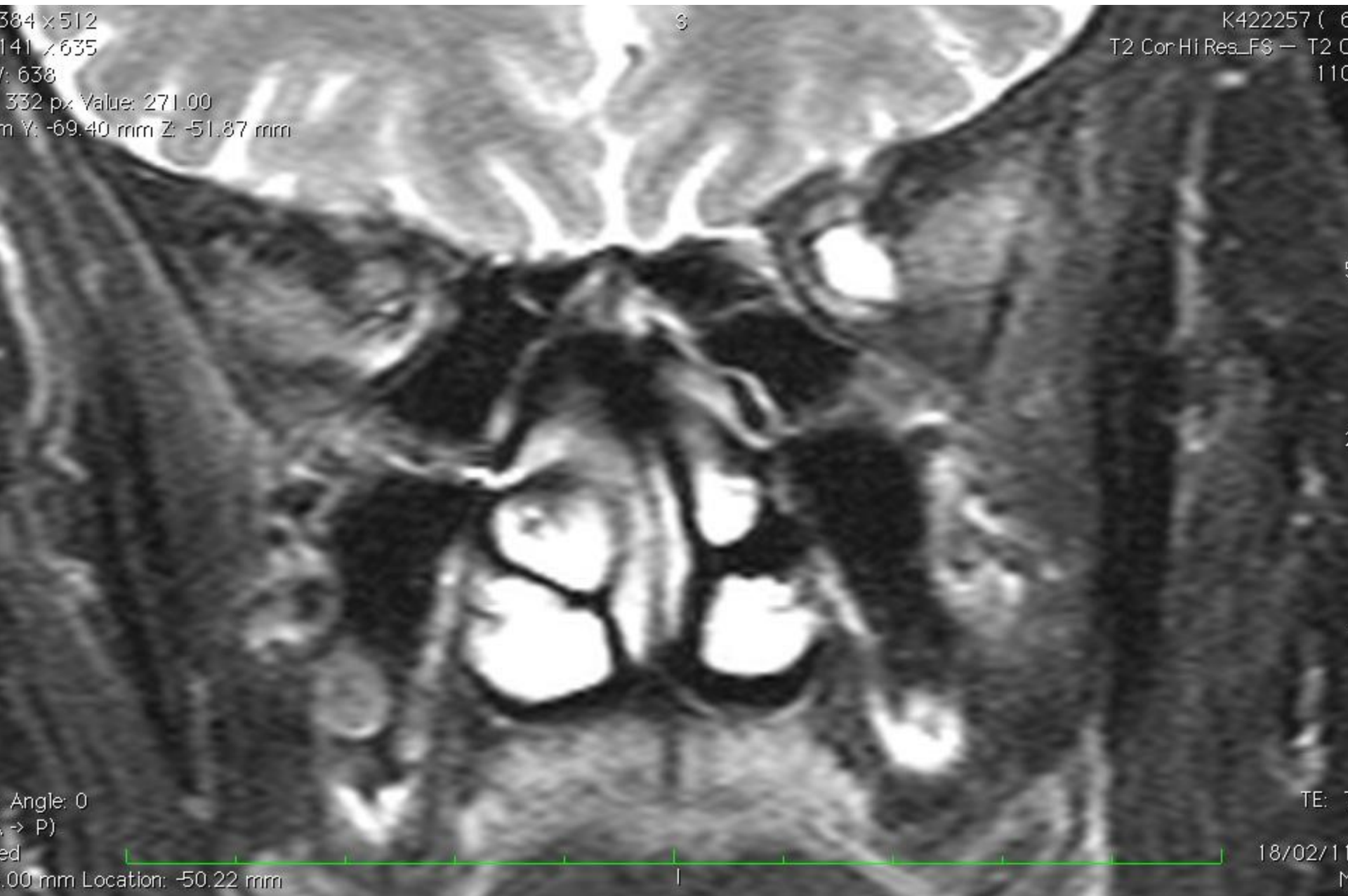


384 x 512
141 x 635
/: 638
332 px Value: 271.00
m Y: -69.40 mm Z: -51.87 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
, -> P)
ed
.00 mm Location: -50.22 mm

TE: 7
18/02/11
M

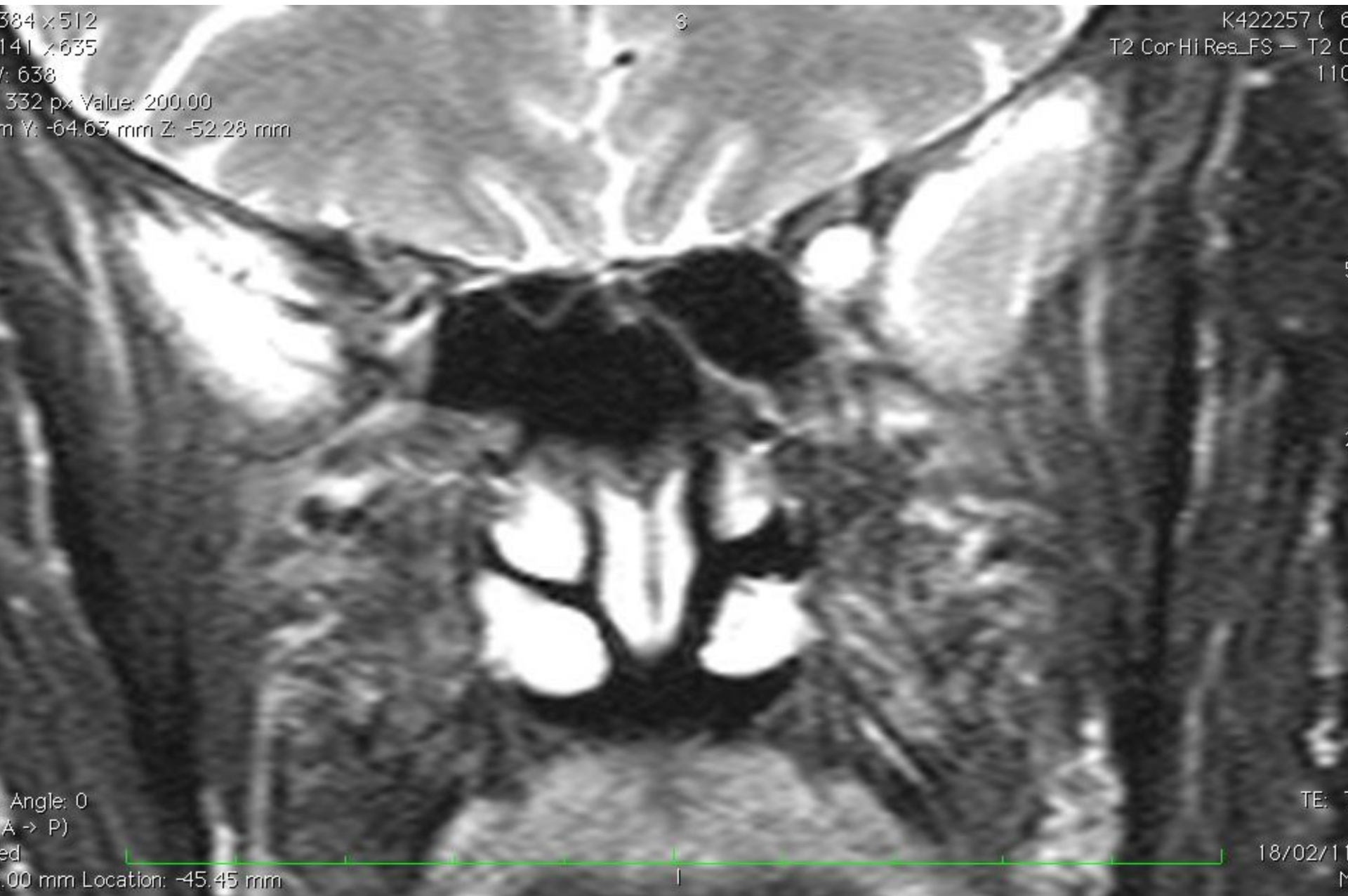


384 x 512
141 x 635
/: 638
332 px Value: 200.00
m Y: -64.63 mm Z: -52.28 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
A -> P)
ed
.00 mm Location: -45.45 mm

TE: 7
18/02/11
M



384 x 512
141 x 635
/: 638
332 px Value: 118.00
m Y: -59.86 mm Z: -52.68 mm

S

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
A -> P)
ed
.00 mm Location: -40.68 mm

TE: 7
18/02/11
M



384 x 512
141 x 635
/: 638

332 px Value: 138.00
m Y: -55.09 mm Z: -53.09 mm

9

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(A -> P)
ed
.00 mm Location: -35.91 mm

TE: 1
18/02/11
M

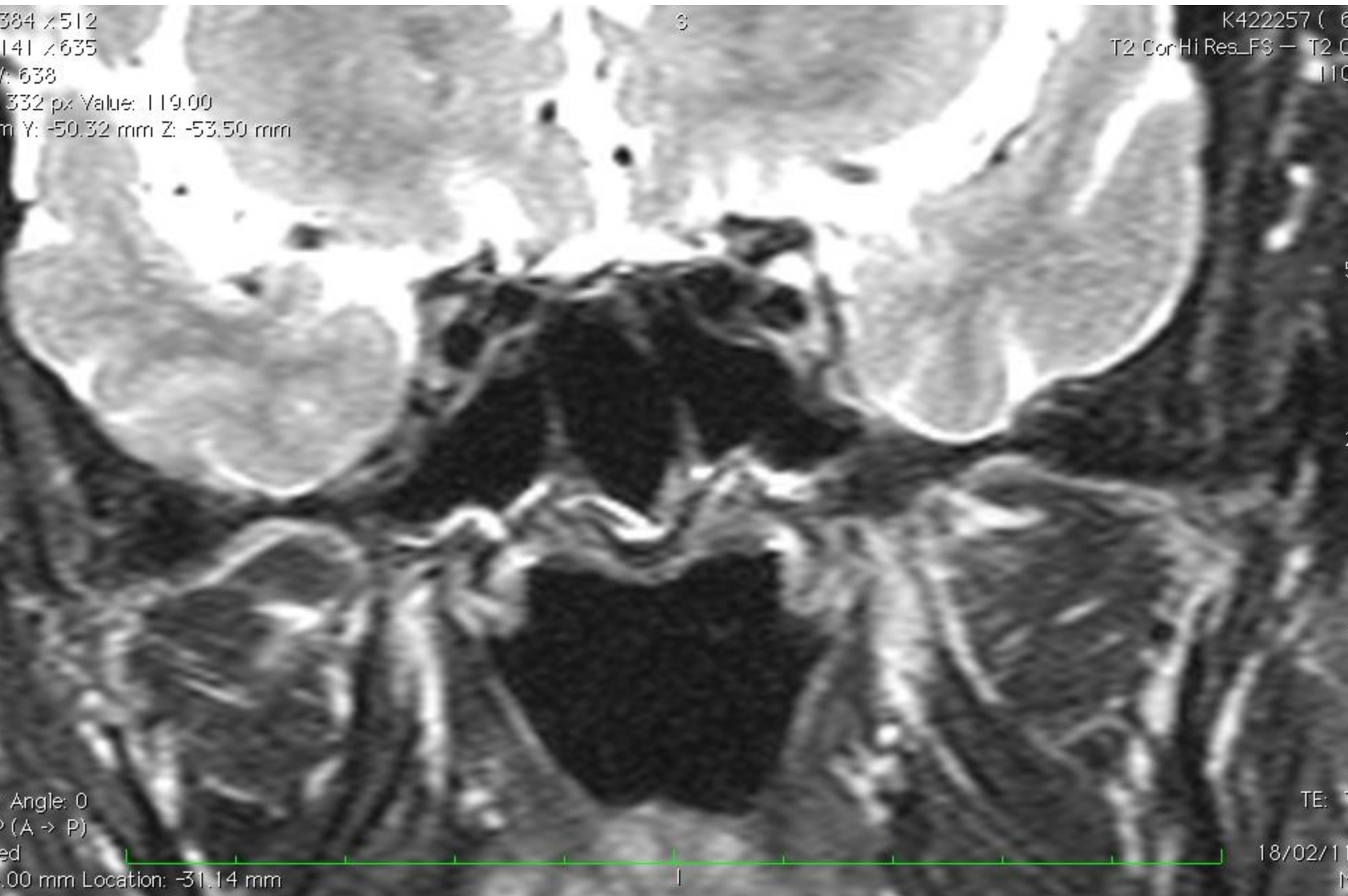


384 x 512
141 x 635
7: 638
332 px Value: 119.00
m Y: -50.32 mm Z: -53.50 mm

K422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(A -> P)
ed
0.00 mm Location: -31.14 mm

TE: 1
18/02/11
M



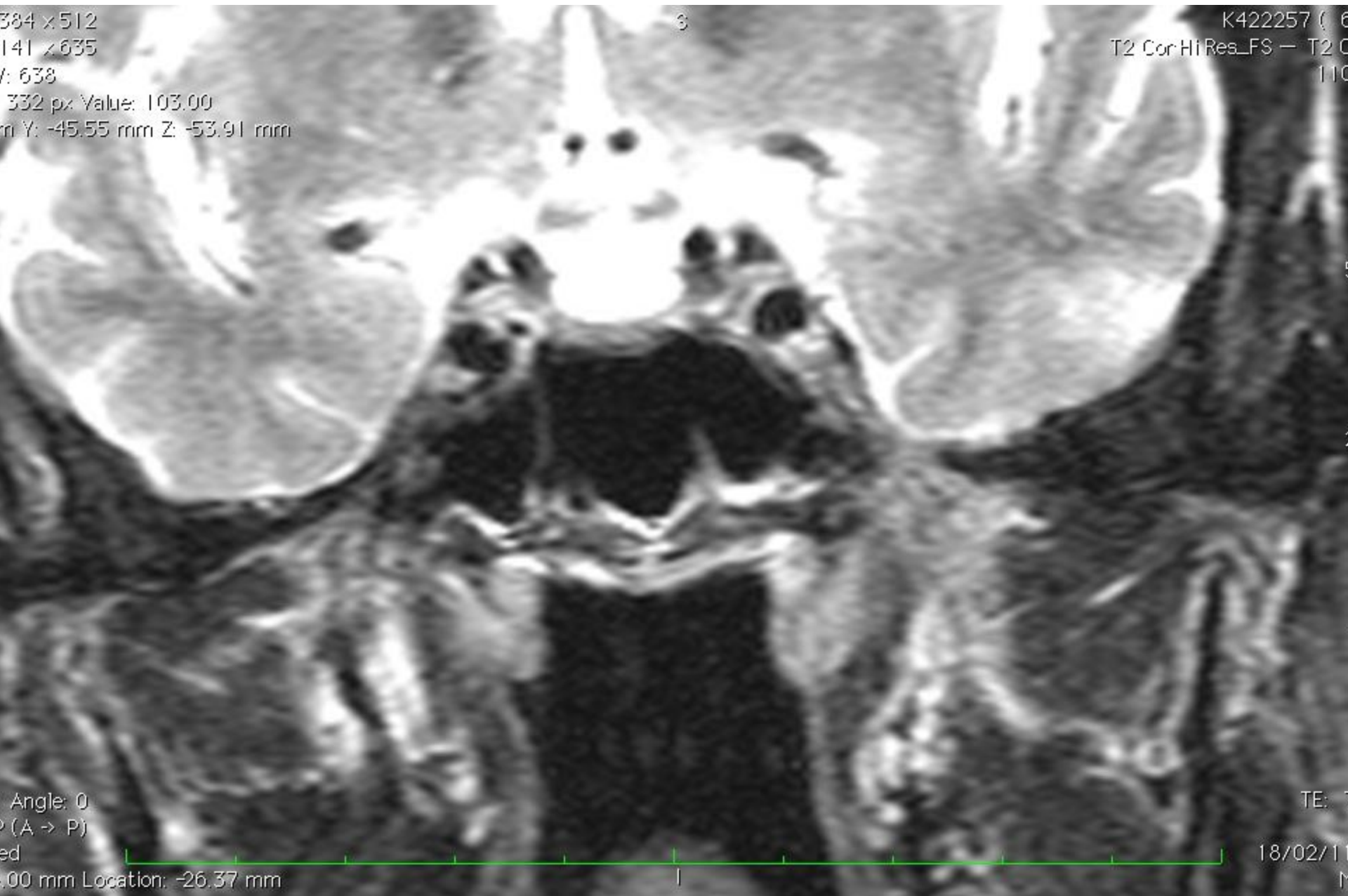
384 x 512
141 x 635
/: 638
332 px Value: 103.00
m Y: -45.55 mm Z: -53.91 mm

3

K422257 (6
T2 Cor Hi Res_FS - T2 C
110

Angle: 0
P (A -> P)
ed
0.00 mm Location: -26.37 mm

TE: 7
18/02/11
M



384 x 512
141 x 635
7: 638
332 px Value: 66.00
m Y: -40.78 mm Z: -54.32 mm

3

Y422257 (6
T2 Cor HI Res_FS - T2 C
110

Angle: 0
(A → P)
ed
.00 mm Location: -21.61 mm

TE: 7
18/02/11
M

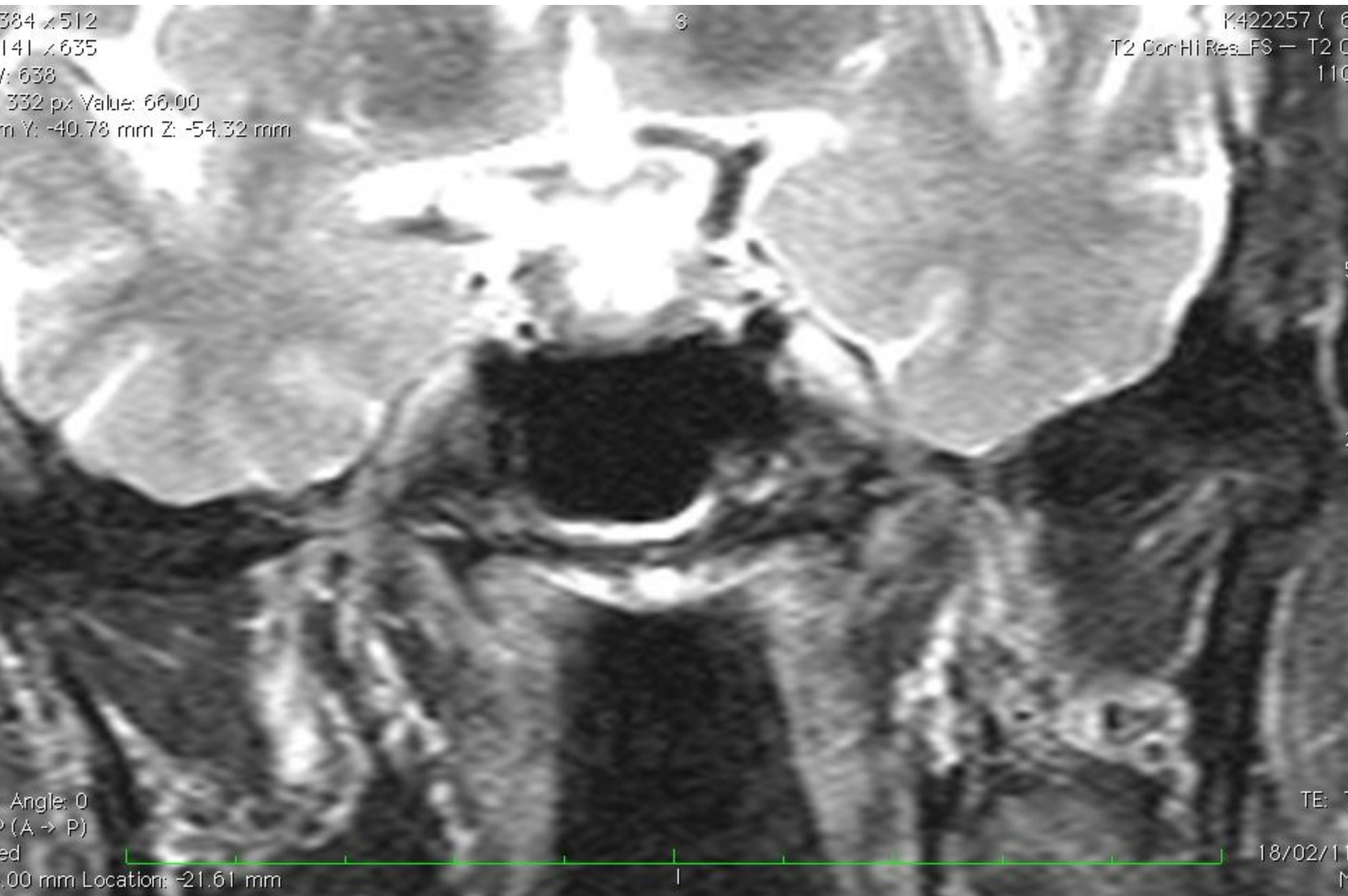


Image size: 256 x 256
View size: 972 x 635
WL: 673 WW: 1334
X: 66 px Y: 209 px Value: 319.00
X: -40.14 mm Y: -6.72 mm Z: -1.14 mm

K422257 (65 y , 65 y)
t1_se_tra_3mm - t1_se_tra_3mm
11012373MRHC
6

R

1340

673

6

Zoom: 380% Angle: 0
Im: 11/15 S (I -> S)
Uncompressed
Thickness: 4.00 mm Location: -0.68 mm

P

TE: 13 TR: 493
FS: 1.5
18/02/11 7:07:28 PM
Made In Osirix

Discussion

DD for isolated fourth CN palsy

- MG
- TED
- Orbital inflammatory pseudotumor
- Skew deviation
- Brown synd
- GCA

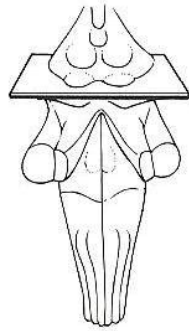
Etiology of CN4 palsy

– Common causes:

- congenital
- Trauma
- Vascular infarct (DM, IHD)
- Demyelinating disease
- Idiopathic

– Rare causes:

- Tumors
- hydrocephalus
- Aneurysm
- GCA



Trochlear nerve

Nucleus, inf
colliculus

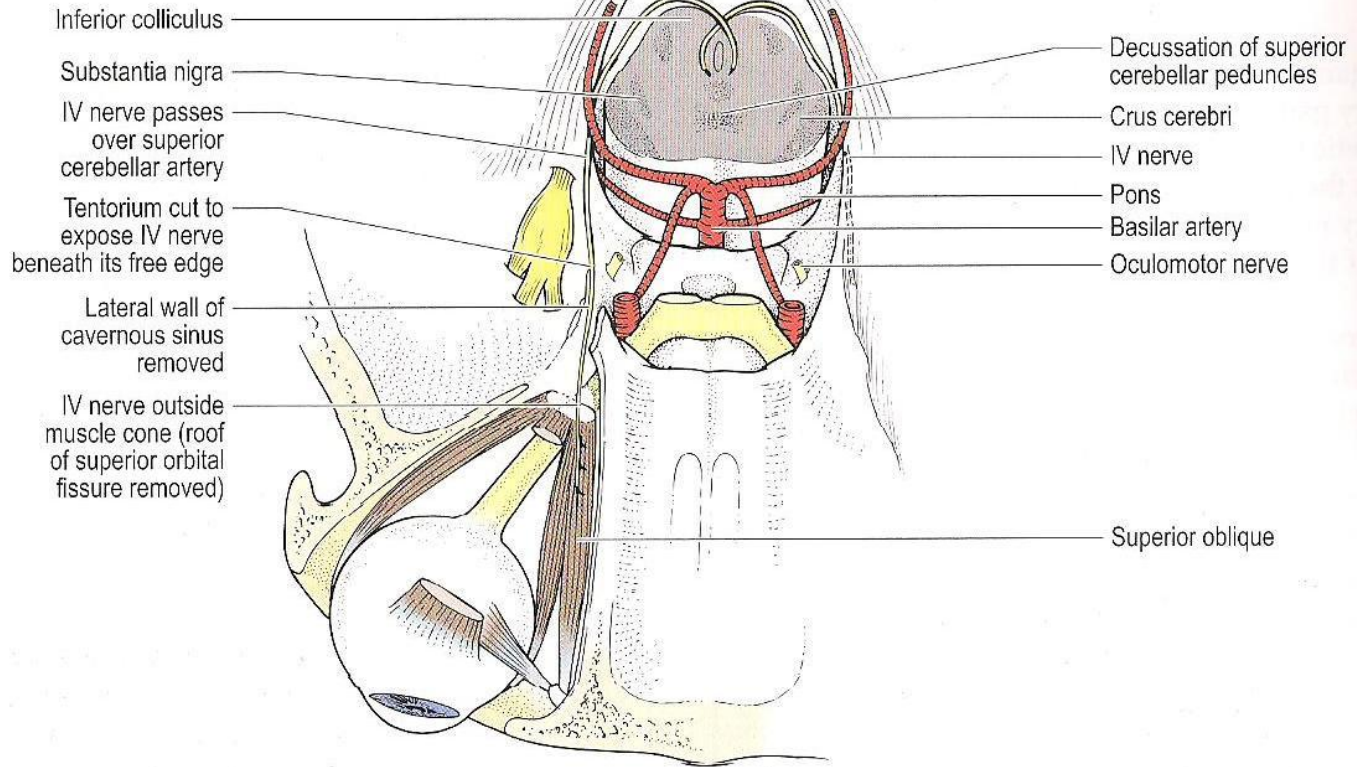
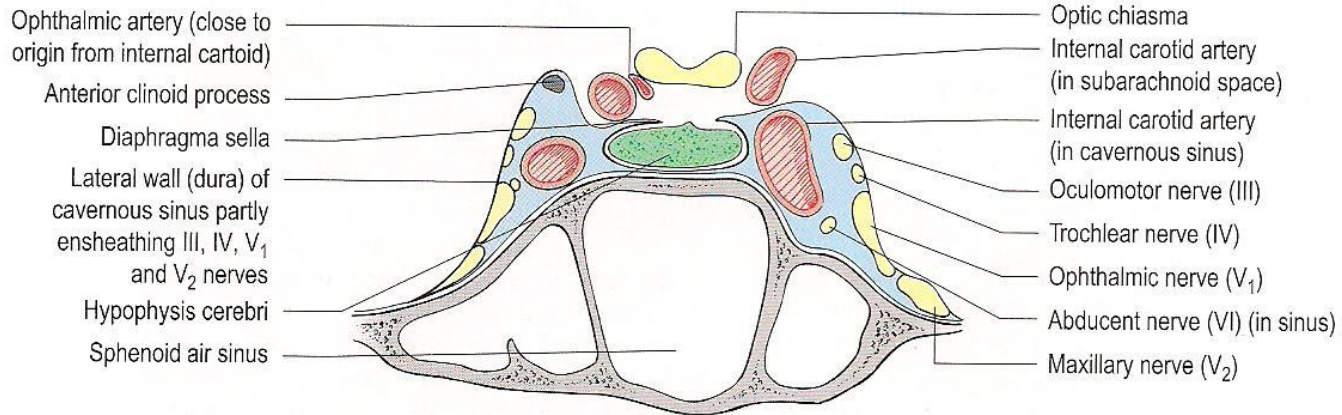
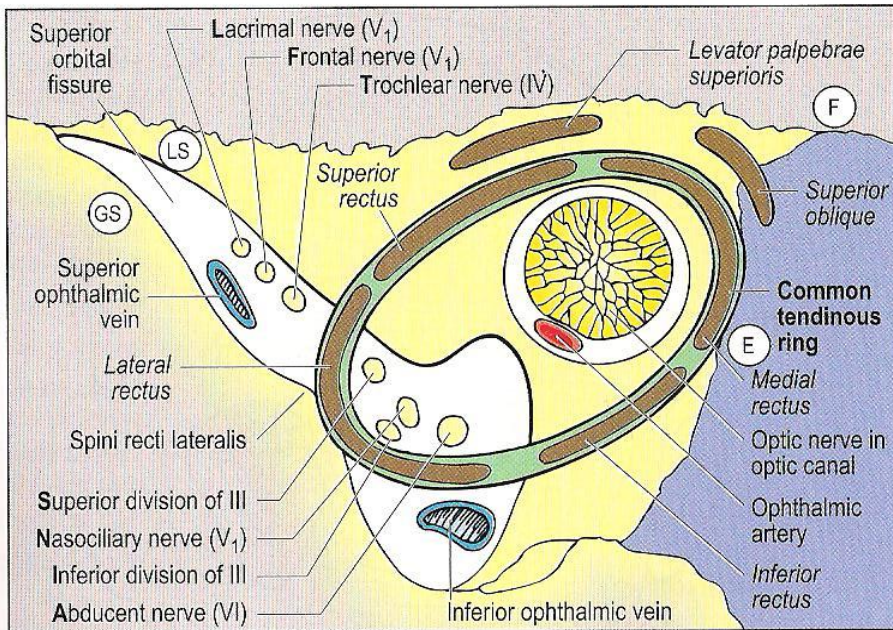


Fig. 1.47 Diagram summarizing the brainstem origin (inset shows level of section), intracranial, intracavernous and intraorbital course of the trochlear nerve.



Cavernous sinus

E



C

Fig. 1.5 Continued (C) Diagram of the superior orbital fissure and optic canal in the right orbit. Note the origins of the extraocular muscles from the common tendinous ring and the relative position of the cranial nerves and vessels as they enter or exit the orbit. GS, greater wing of sphenoid; LS, lesser wing of sphenoid; F, frontal bone; E, ethmoid. The positions of the veins are variable. The first letters of each of the structures passing through the superior orbital fissure (LFTSNIA) form a well-known mnemonic.

Orbit,
SOF
outside
m cone

Varix

- Low flow vascular malformation, can be thrombosed
- Typically appear in young adults
- Characterized by positional proptosis (head down & valsalva)
- Imaging : round/irregular mass – inapperent until valsalva performed during scanning



Figure 3-85. Minimal proptosis of the left eye in a 38-year-old woman who complains of a full feeling behind the left eye when she bends forward.



Figure 3-86. Appearance when patient bends forward showing more proptosis of the left eye.

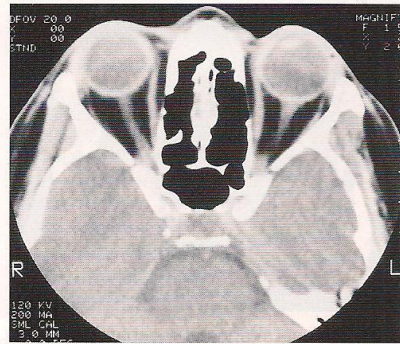


Figure 3-87. Axial computed tomogram of the same patient showing no apparent orbital mass.

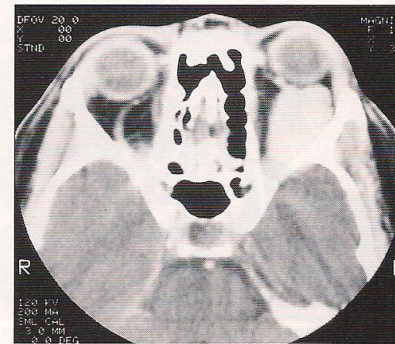


Figure 3-88. Axial computed tomogram of the same patient with contrast enhancement during Valsalva maneuver. Note that the enhancing orbital mass now is more prominent.



Figure 3-89. Axial magnetic resonance in T1-weighted image of the same patient showing no apparent mass.

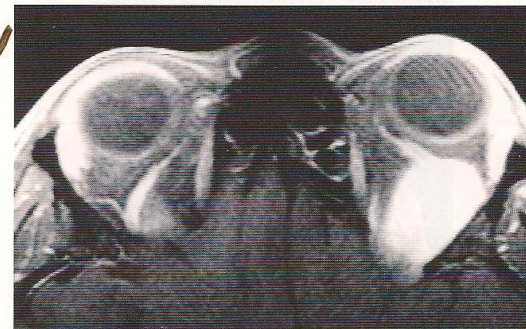


Figure 3-90. Axial magnetic resonance imaging during Valsalva maneuver demonstrated the mass.

Neurilemoma (schwannoma)

- Usually benign tumor that arise from schwann cells that unsheath peripheral nerves
- Usually in young-middle age adults
- Usually appear as a non inflammatory proptosis
- Rarely cause pain
- Imaging: A solid ovoid / elongated mass, usually outside the muscle cone, along the course of supratrochlear/supraorbital nerve, sometimes the infraorbital nerve

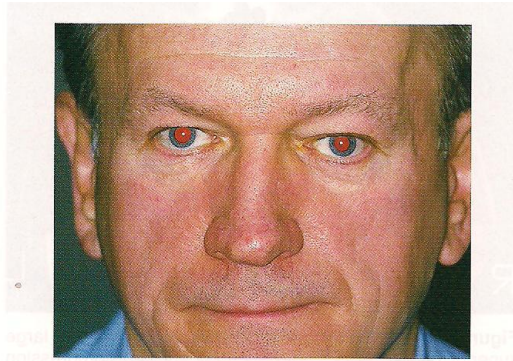


Figure 4-1. Proptosis and downward displacement of the left eye in a 57-year-old man.

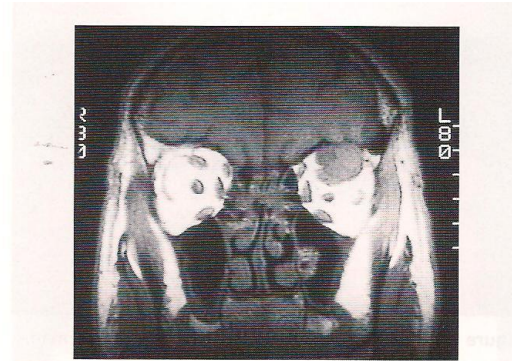


Figure 4-2. Coronal magnetic resonance imaging in T1-weighted image showing circumscribed superior orbital mass.

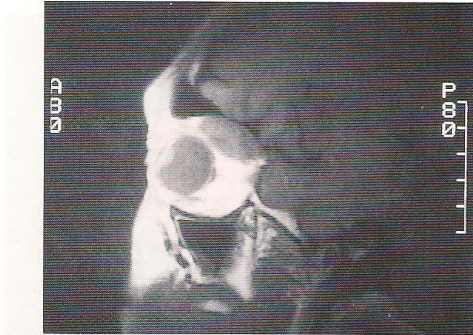


Figure 4-3. Sagittal magnetic resonance imaging in T1-weighted image showing ovoid shape of the superior orbital mass.



Figure 4-4. Outline of cutaneous incision for removal of the mass. The lesion was removed without complications.

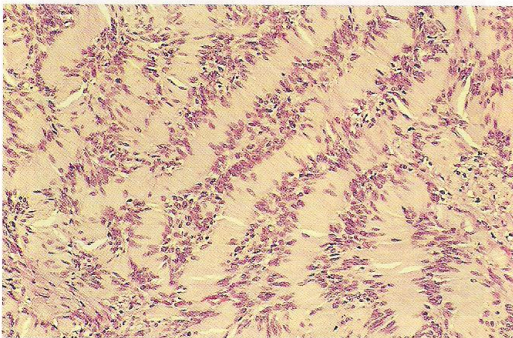


Figure 4-5. Histopathology showing an area of Antoni A pattern with fascicles of nuclei with a ribbon arrangement (hematoxylin–eosin, original magnification $\times 150$).

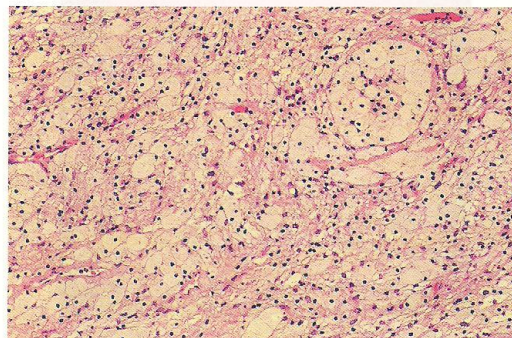


Figure 4-6. Histopathology of another area of the same tumor showing Antoni B pattern (hematoxylin–eosin, original magnification $\times 150$).

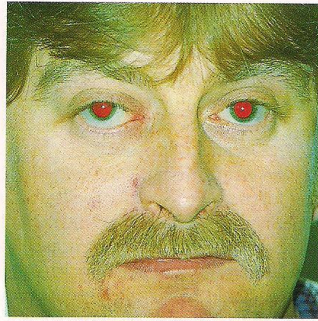


Figure 4-13. Clinical appearance showing proptosis of the right eye.

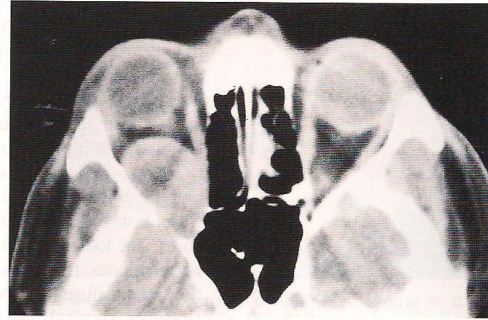


Figure 4-14. Axial computed tomography showing large circumscribed mass occupying most of posterior orbit and extending through the superior orbital fissure into the brain.



Figure 4-15. Appearance of the mass immediately after removal by orbitotomy. The nodular protrusion corresponded to where the tumor protruded posteriorly through the superior orbital fissure.

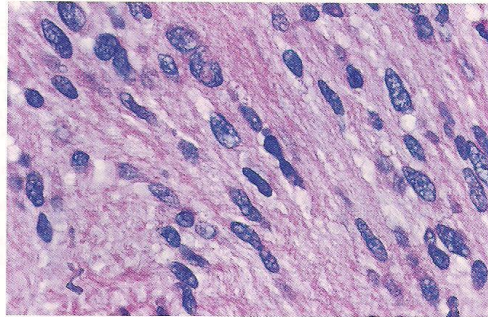


Figure 4-16. Histopathology of an area of tumor showing neurilemoma with Antoni A pattern (hematoxylin–eosin, original magnification $\times 200$).

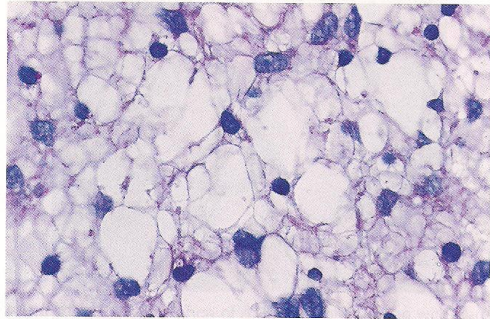


Figure 4-17. Histopathology of another area of the tumor showing Antoni B pattern (hematoxylin–eosin, original magnification $\times 200$).



Figure 4-18. Electron photomicrograph of tumor showing wide-spacing collagen in the cytoplasm (Luse body).

Neurofibroma

- benign peripheral nerve tumor composed of schwann cells, fibroblasts and axons.
- Divided to: localized, diffused & plexiform
- Associated with Neurofibromatosis type II
- The localized form is encapsulated > Tx: complete excision; in unresectable lesion-conservative Tx



Figure 4-25. Facial appearance showing proptosis of the left eye.

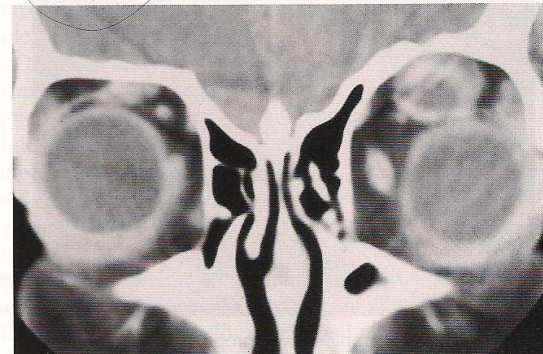


Figure 4-26. Coronal computed tomography showing superior orbital mass with cyst-like central portion.

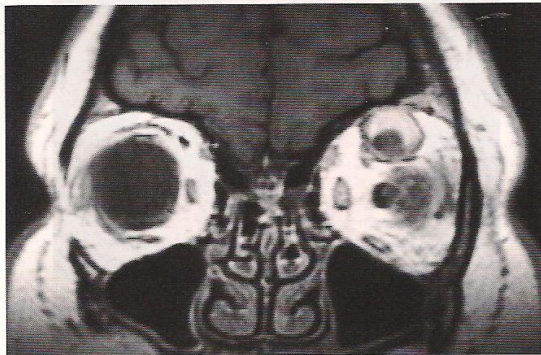


Figure 4-27. Coronal magnetic resonance imaging in T1-weighted image showing the superior orbital mass with low-signal component.

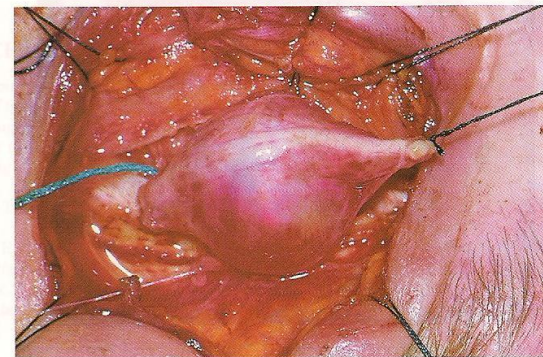


Figure 4-28. Appearance of the mass at the time of surgical exposure. Note the visible nerve coursing along the margin of the mass.

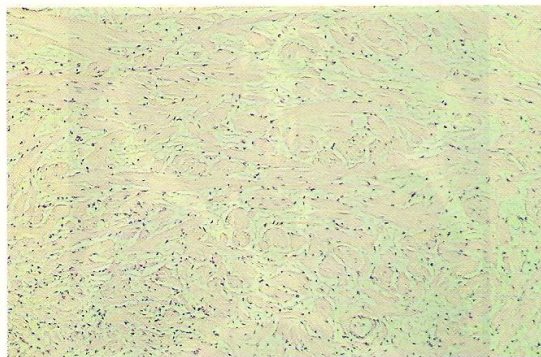


Figure 4-29. Histopathology of the tumor showing large eosinophilic nerve bundles (hematoxylin-eosin, original magnification $\times 75$).

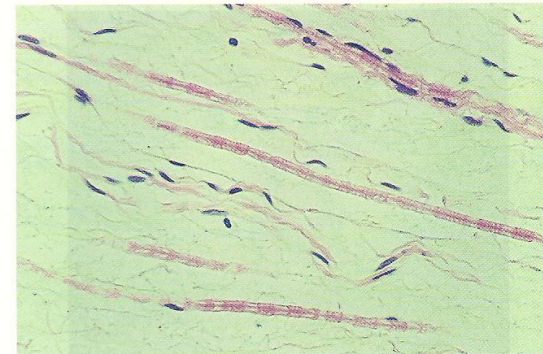


Figure 4-30. Histopathology showing area of extensive mucinous degeneration, corresponding to the low-signal component seen on magnetic resonance imaging and computed tomography (hematoxylin-eosin, original magnification $\times 75$).

Optic nerve sheath meningioma

- Benign tumor arising from arachnoid cells that surround the optic nerve.
- 2 peaks of appearance: childhood (aggressive) and adults (more common in women)
- Presentation: visual loss, swollen or optic atrophy, optocilliary shunt vessels, proptosis.
- Imaging: enlarged round or fusiform optic nerve
- Surgery usually leads to blindness, > Irradiation

Primary Optic Nerve Sheath Meningioma



Figure 5-25. Minimal prominence of the right eye in a 38-year-old woman with mild visual loss.

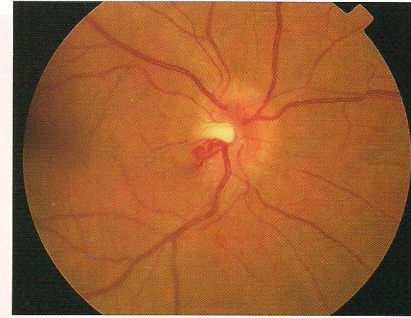


Figure 5-26. Appearance of the optic disc in the patient shown in Fig. 5-25 demonstrating retinochoroidal shunt vessel on the inferotemporal margin of the optic disc. Photographs taken 2 years early showed no shunt vessel, which was observed to develop gradually.

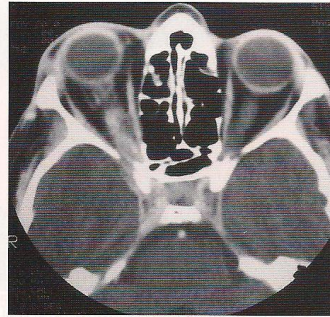


Figure 5-27. Axial computed tomography showing meningeoma of the right optic nerve sheath.

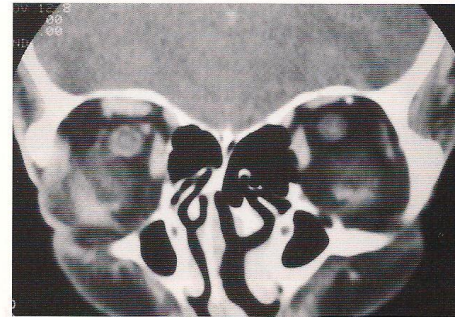


Figure 5-28. Coronal computed tomography showing the same lesion depicted in Fig. 5-27.

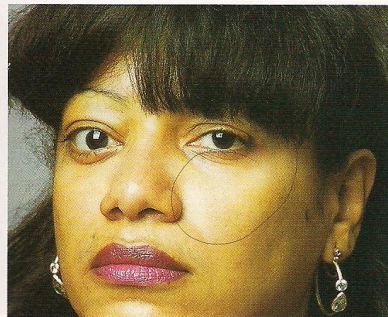


Figure 5-29. Proptosis of the right eye in a 39-year-old woman with an optic nerve sheath meningioma.

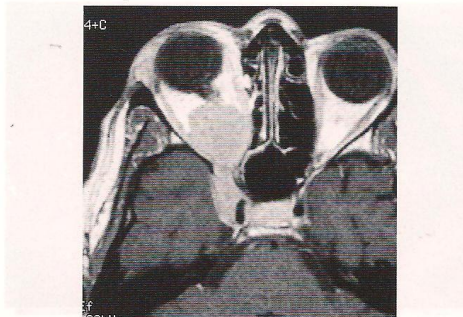


Figure 5-30. Coronal magnetic resonance imaging in T1-weighted image of the patient shown in Fig. 5-29 revealing a round mass arising from the posterior aspect of the optic nerve with extension through the optic canal into the chiasm. The tumor was resected via a transcranial route.