

Neuro MR protokoly

3 Tesla

FN Plzeň

R. Süss

R. Tupý

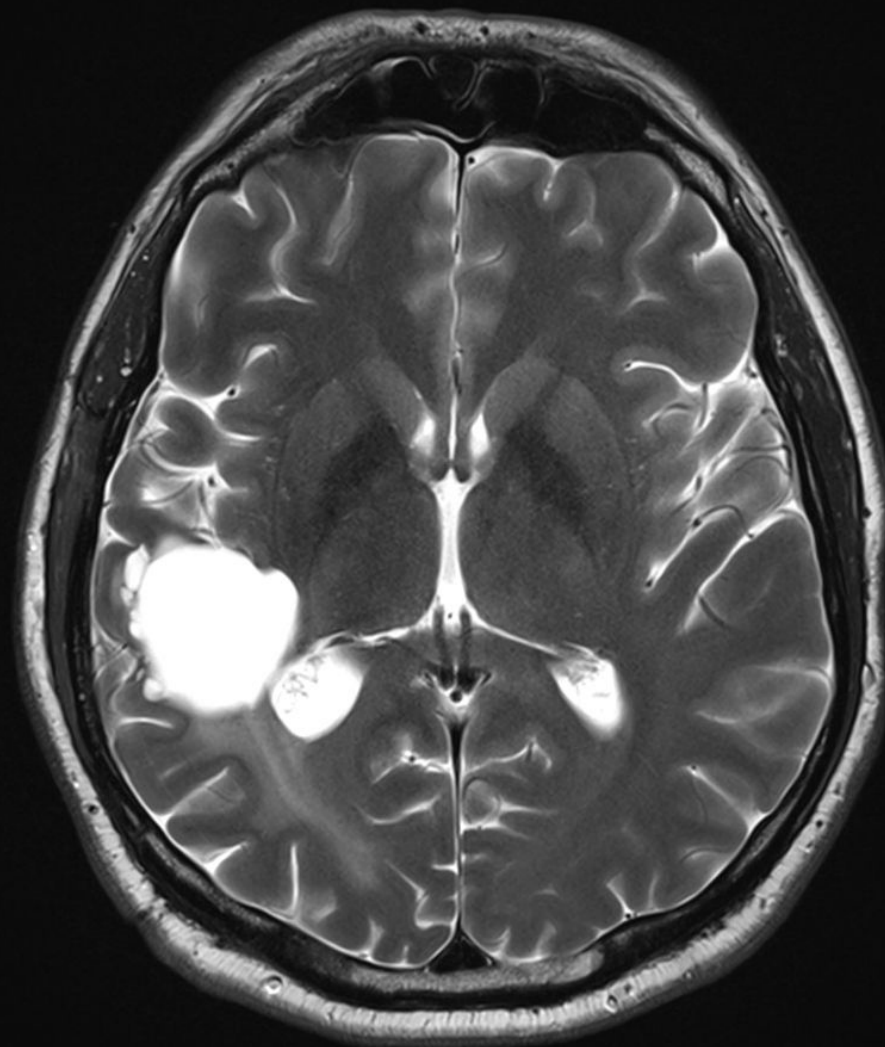
J. Ferda

Siemens Skyra 3T

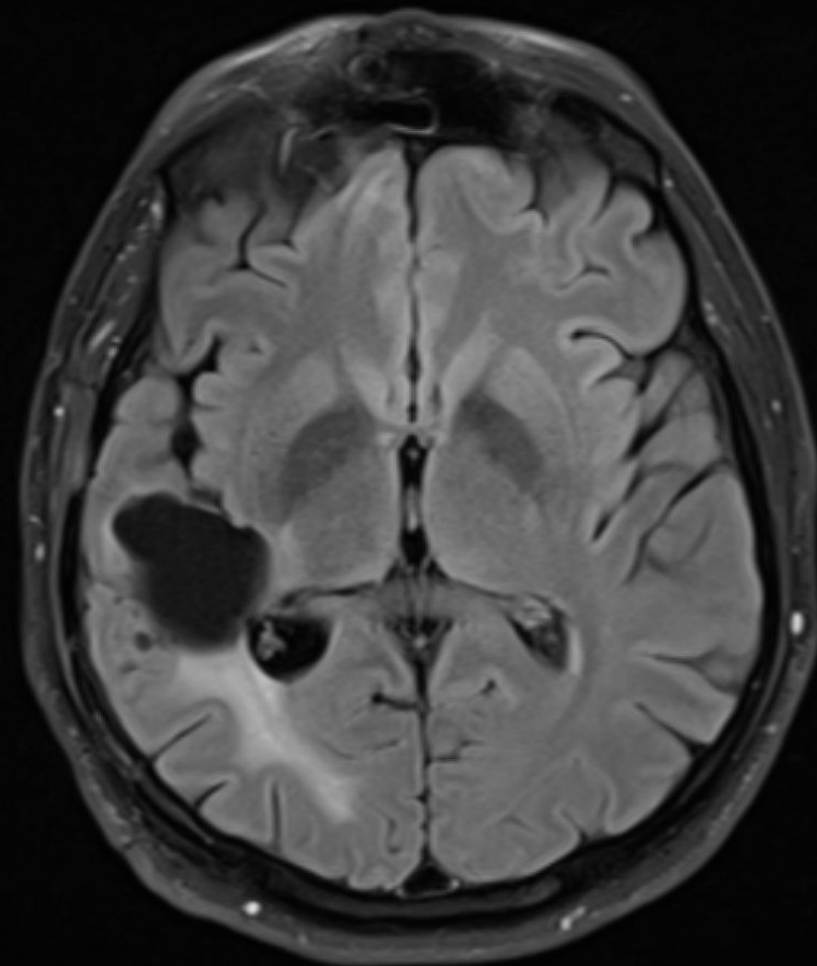
Mozek

3 Tesla

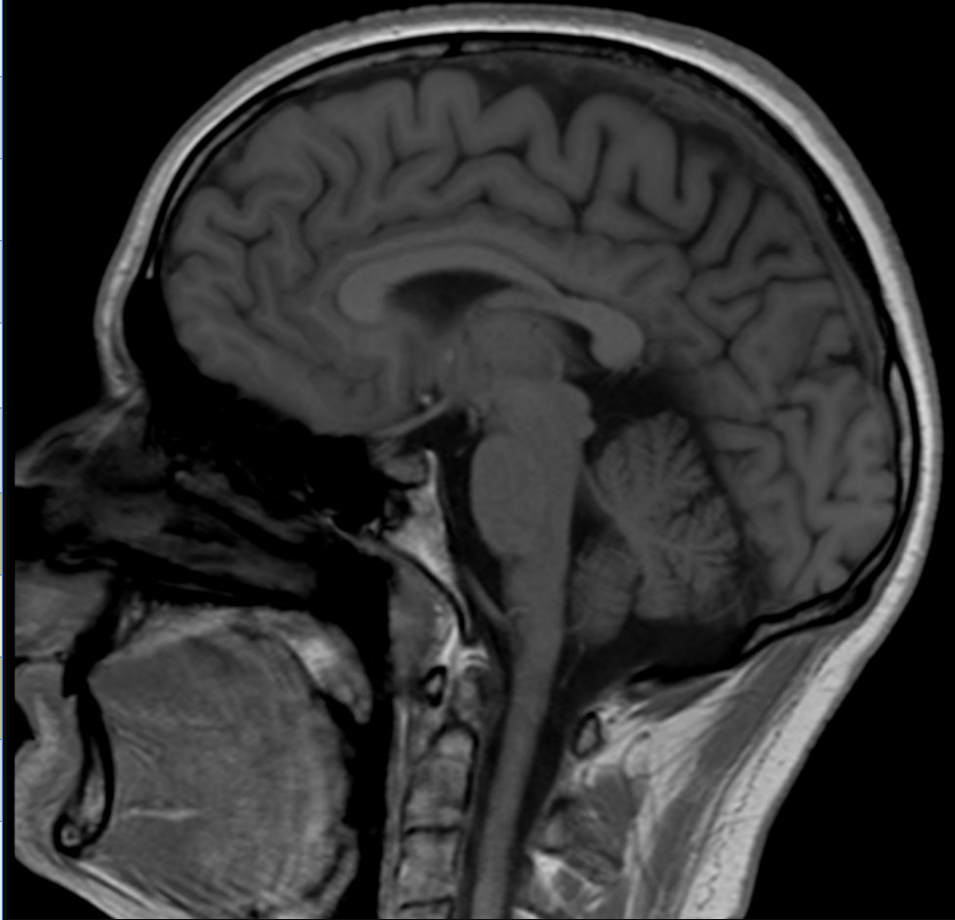
Typ	T2 standard
Sekvence	TSE
Rovina	TRA
Vrstva mm	4/27 dist. 30%
FoV mm	220
Matrix	512 x 512 + interp.
Fáze	L-R
PAT	2 GRAPPA
TR ms	6000
TE ms	100
turbo	18
Čas	4:32
Různé	AVG 2 Conc. 1 FA 150 Phase overs. 50% ETL per sl. 22 BW 220 Interleaved



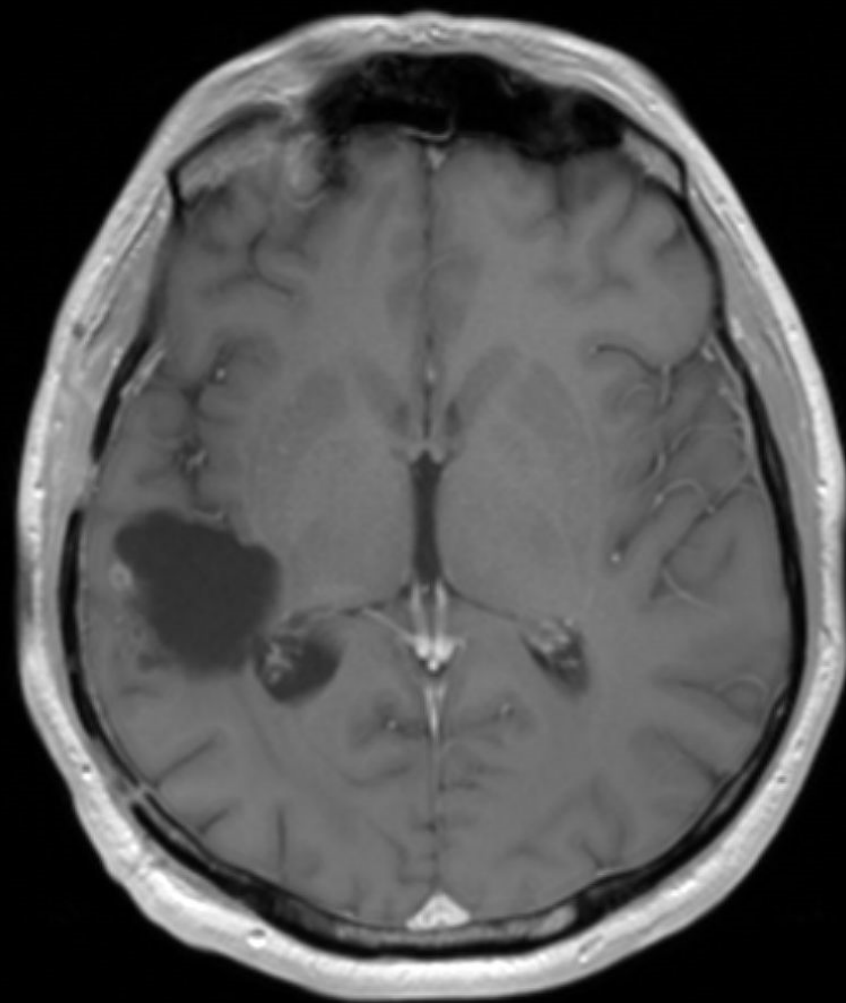
Typ	T2 tirm FLAIR standard
Sekvence	TSE
Rovina	TRA
Vrstva mm	4/27 dist. 30%
FoV mm	220
Matrix	320 x 217 + interp.
Fáze	L-R
PAT	off
TR ms	9000
TE ms	81
turbo	16
Čas	4:32
Různé	AVG 1 Conc. 2 TI 2500 FA 150 Phase overs. 0% ETL per sl. 14 BW 289 Reduce motion sensit. ON Interleaved



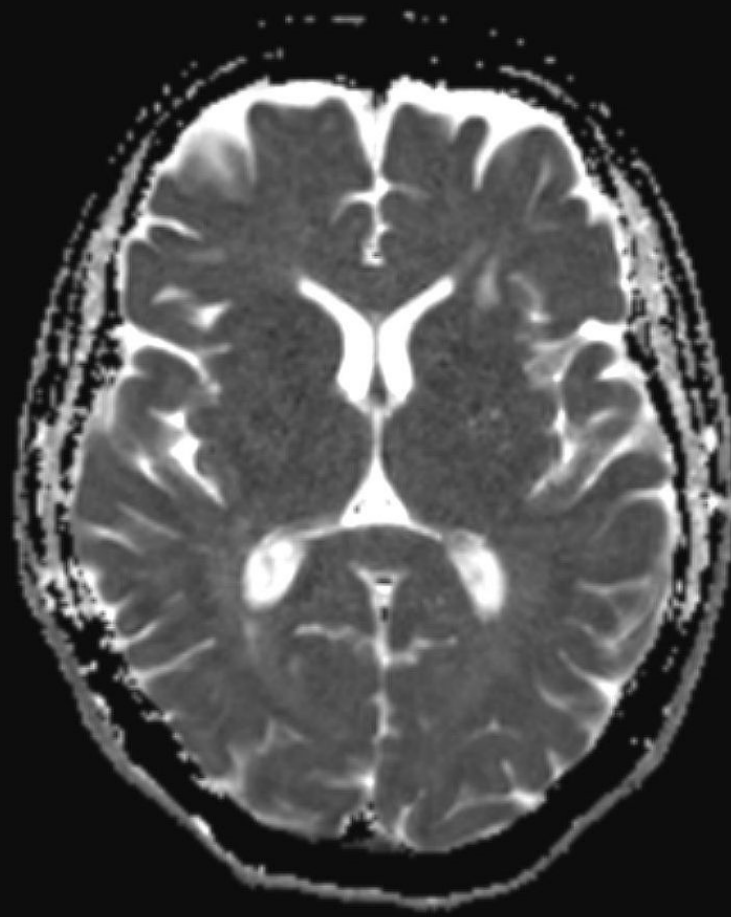
Typ	T1 standard
Sekvence	fl2d
Rovina	SAG
Vrstva mm	4/37 dist 30%
FoV mm	220
Matrix	320 x 256 + interp.
Fáze	A-P
PAT	off
TR ms	250
TE ms	2,46
Čas	1:25
Různé	AVG 1 Conc. 1 FA 70 Phase overs. 30% BW 380 Interleaved



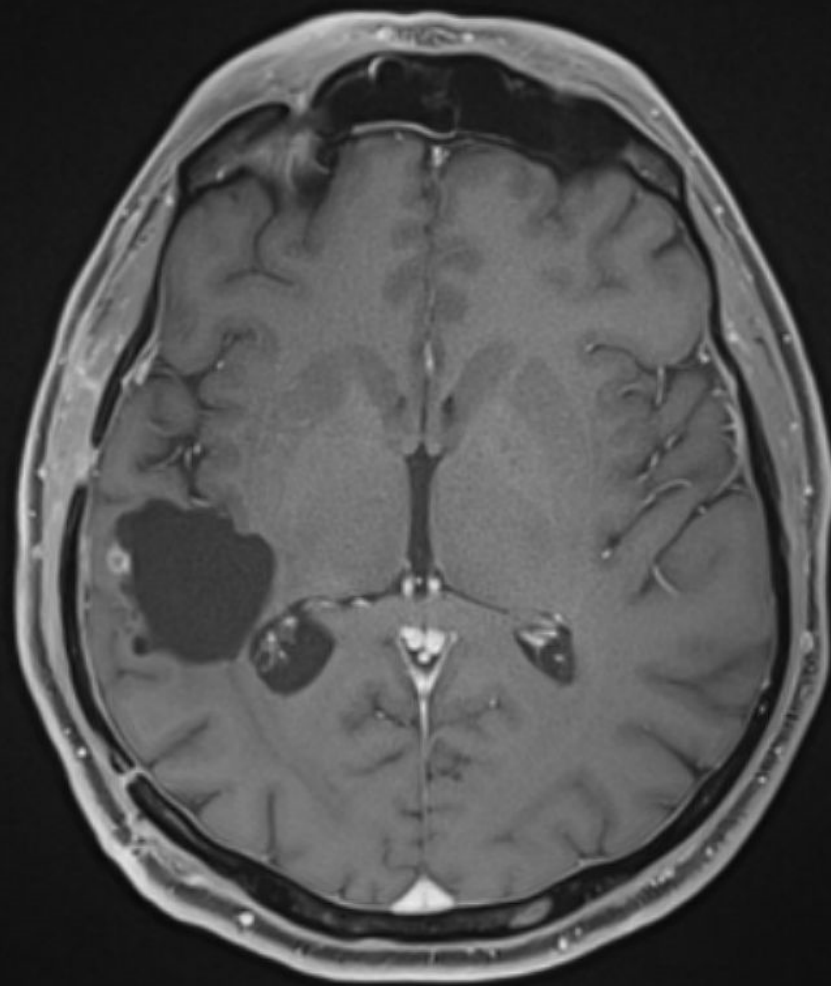
Typ	T1 standard
Sekvence	fl2d
Rovina	TRA
Vrstva mm	4/31 dist 30%
FoV mm	220
Matrix	320 x 256 + interp.
Fáze	L-R
PAT	off
TR ms	250
TE ms	2,48
turbo	
Čas	1:19
Různé	AVG 1 Conc. 1 FA 70 Phase overs. 20% BW 360 Interleaved



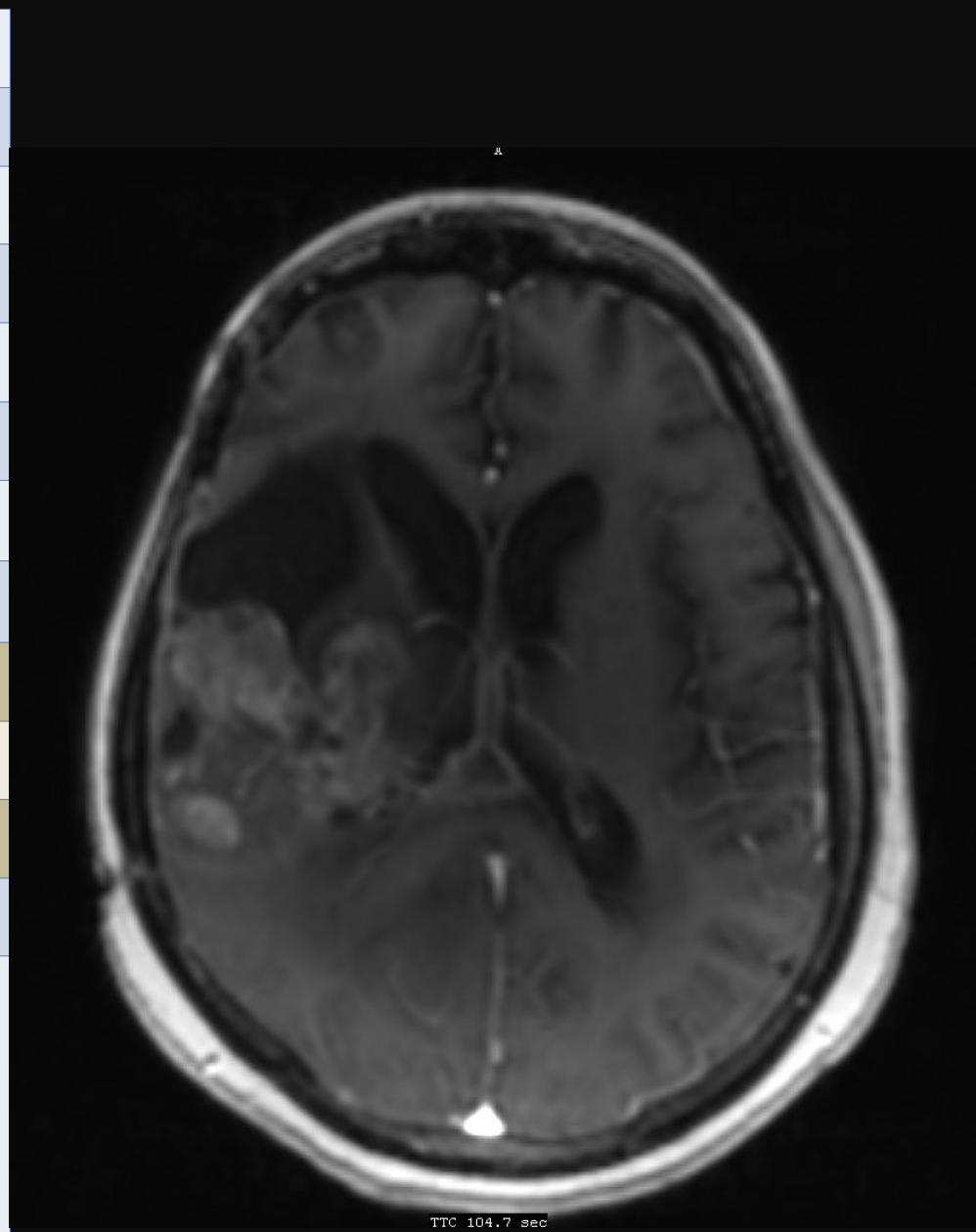
Typ	DWI 3scan trace
Sekvence	RESOLVE , 3 directions
Rovina	TRA
Vrstva mm	4/27 dist 30%
FoV mm	220
Matrix	224 x 224
Fáze	A-P
PAT	2 GRAPPA
TR ms	5700
TE ms	73
B value	0 , 1000, diff scheme monopolar
Čas	3:32
Různé	Fat sat – strong Conc. 1 Avg. 1 FA 70 Phase overs. 0% BW 657 Interleaved EPI factor 112



Typ	T1 KL,navigace
Sekvence	Starvibe fs
Rovina	Tra !!
Vrstva mm	0,7/256/1 slab
FoV mm	256
Matrix	384 base, 50% slice
Fáze	A-P
PAT	off
TR ms	4,89
TE ms	2,17
Radial v.	2x base resolution = 768/505
Čas	7:34/4:58
Různé	Iso 0,7x0,7x0,7 FA 9 Conc. 1 Avg 1 Phase overs. 0% BW 520 Dist.corr.

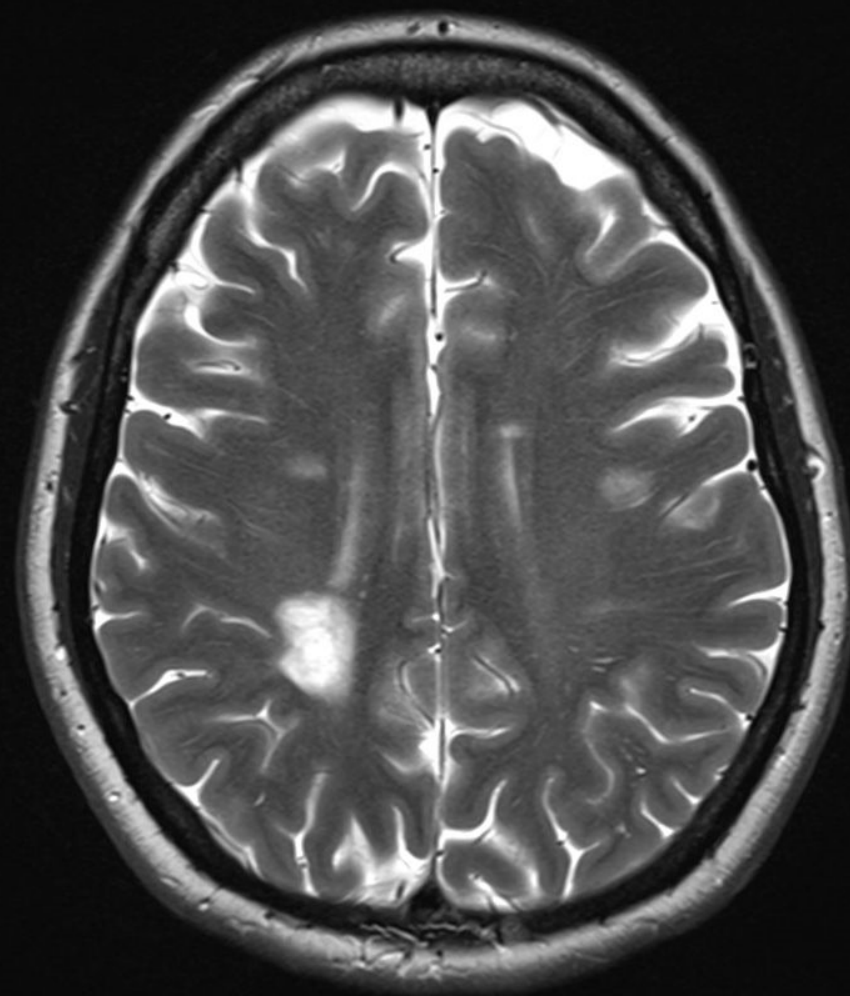


Typ	T1 KL
Sekvence	TWIST dynamic
Rovina	Tra
Vrstva mm	3,5/20/1 slab
FoV mm	220
Matrix	192 X 154 + interp.
Fáze	R-L
PAT	2 GRAPPA
TR ms	5
TE ms	1,95
Radial v.	2x base resolution = 768/505
Čas	3:56
Různé	Dynamic 45x FA 12 Conc. 1 Avg 1 Phase overs. 20% BW 260

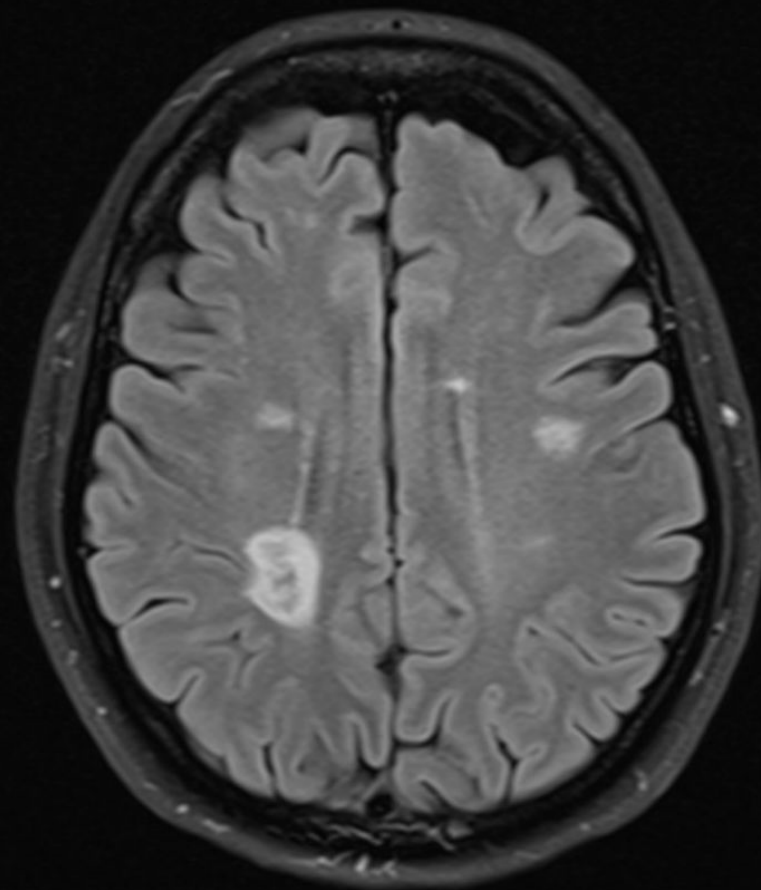


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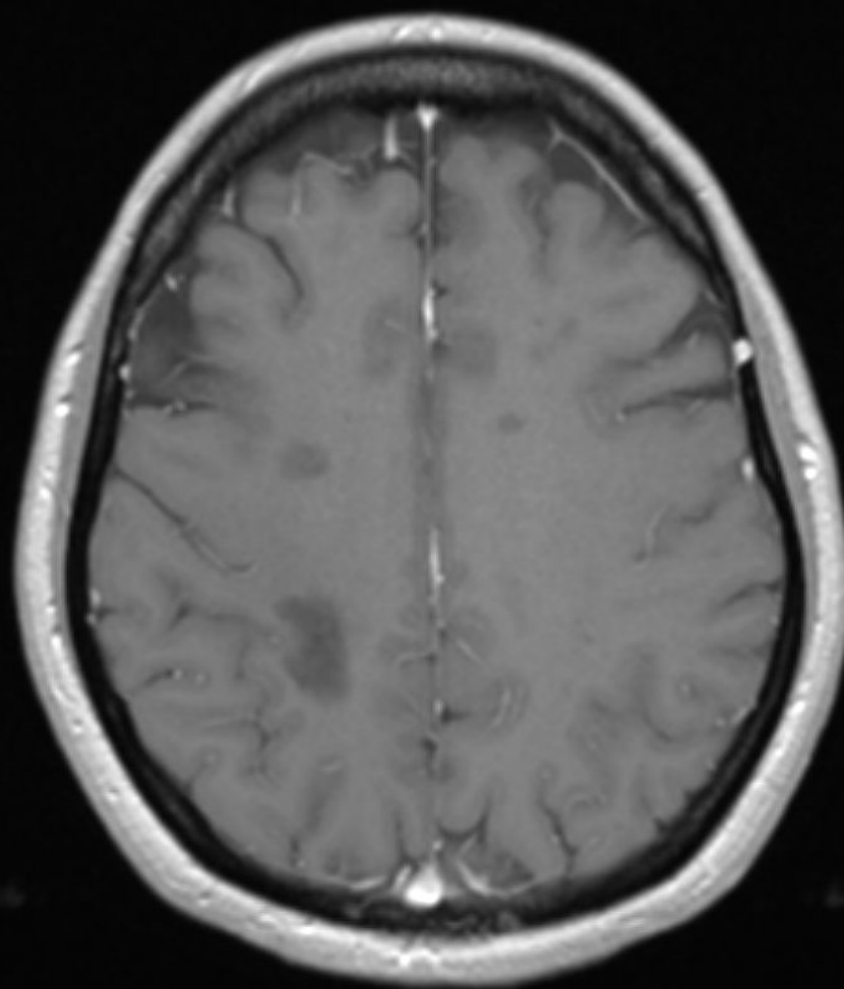
Typ	T2 RS quiet
Sekvence	TSE
Rovina	TRA
Vrstva mm	3/33 dist. 30%
FoV mm	220
Matrix	512 x 384 + interp.
Fáze	L-R
PAT	2 GRAPPA
TR ms96	6630
TE ms	100
turbo	16
Čas	2:47
Různé	AVG 2 Conc. 1 FA 150 Phase overs. 0% ETL per sl. 12 BW 222 Interleaved



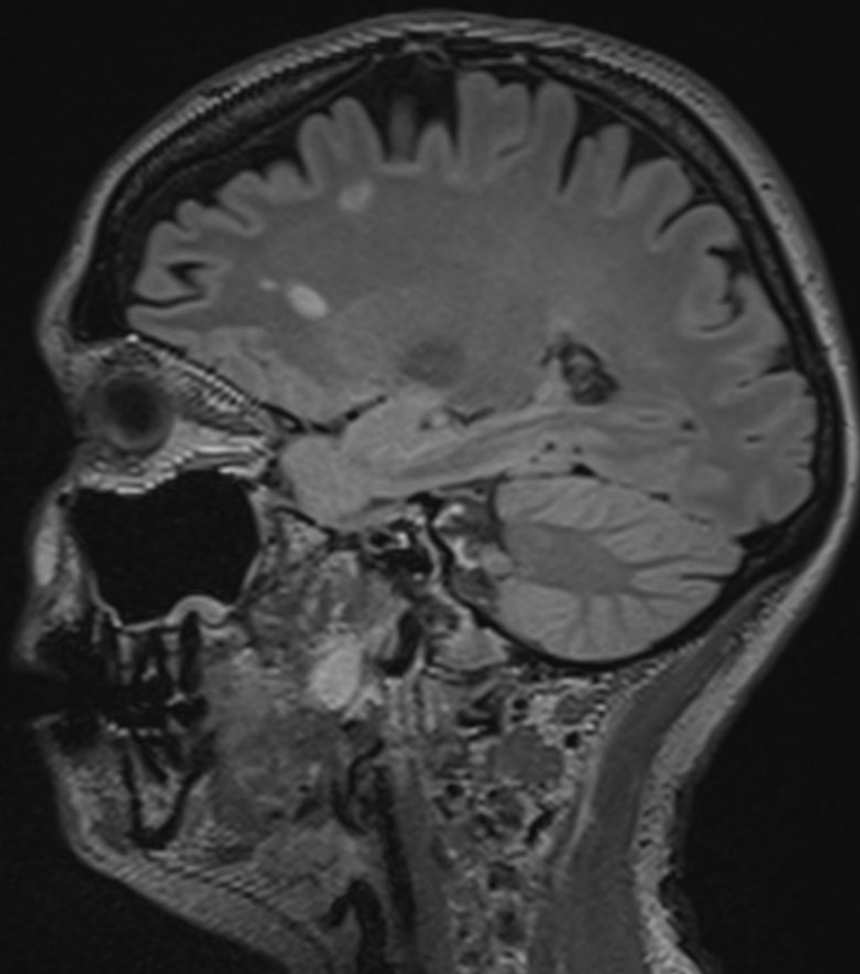
Typ	T2 tirm FLAIR RS
Sekvence	TSE
Rovina	TRA
Vrstva mm	3/35 dist 30%
FoV mm	220
Matrix	320 x 217 + interp.
Fáze	L-R
PAT	off
TR ms	9000
TE ms	81
turbo	16
Čas	4:32
Různé	AVG 1 Conc. 2 TI 2500 FA 150 Phase overs. 0% ETL per sl. 14 BW 289 Reduce motion sensit. ON Interleaved



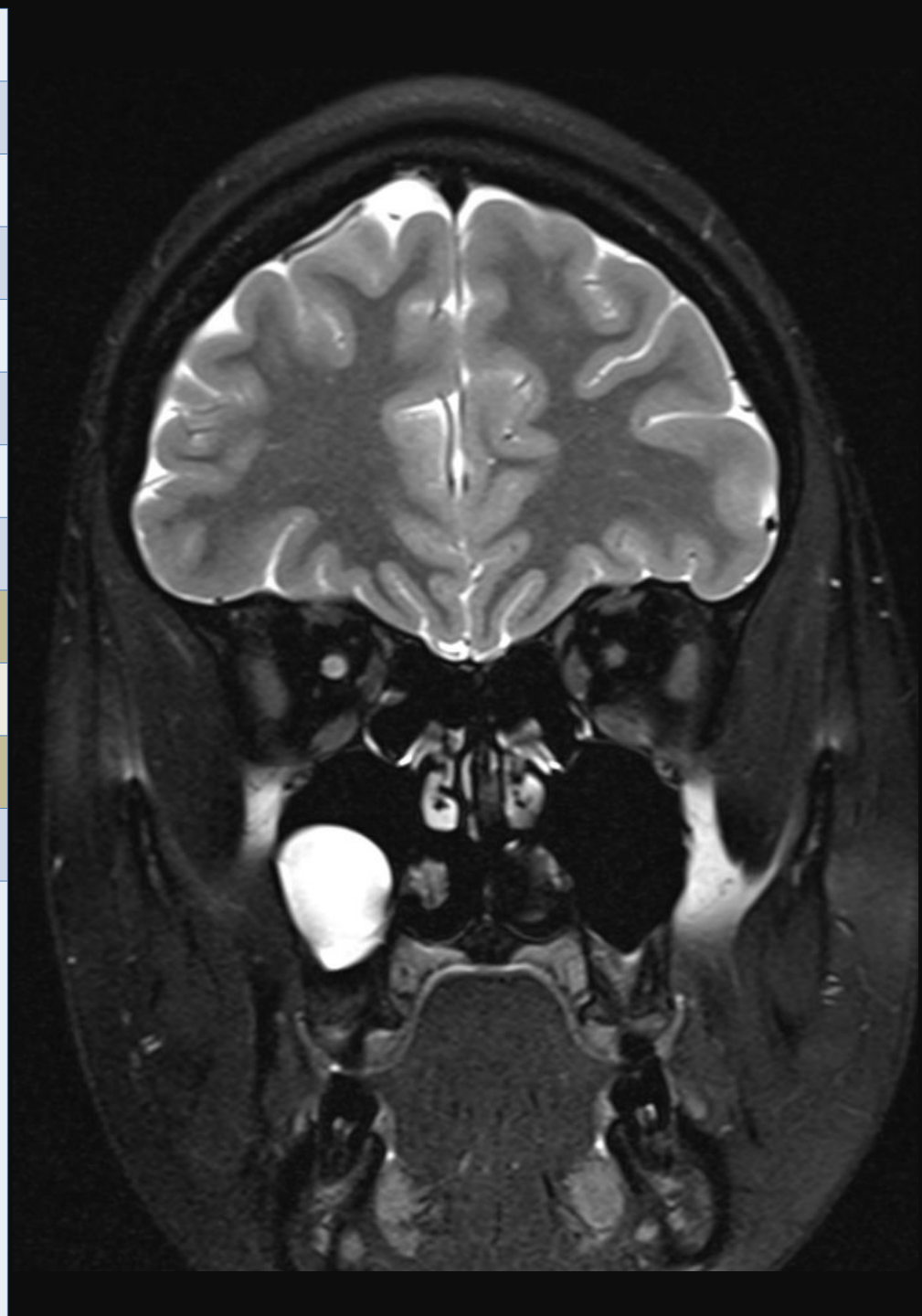
Typ	T1 RS
Sekvence	fl2d
Rovina	TRA
Vrstva mm	3/33 dist 30%
FoV mm	220
Matrix	320 x 256 + interp.
Fáze	L-R
PAT	off
TR ms	250
TE ms	2,48
turbo	
Čas	1:19
Různé	AVG 1 Conc. 1 FA 70 Phase overs. 20% BW 360 Interleaved



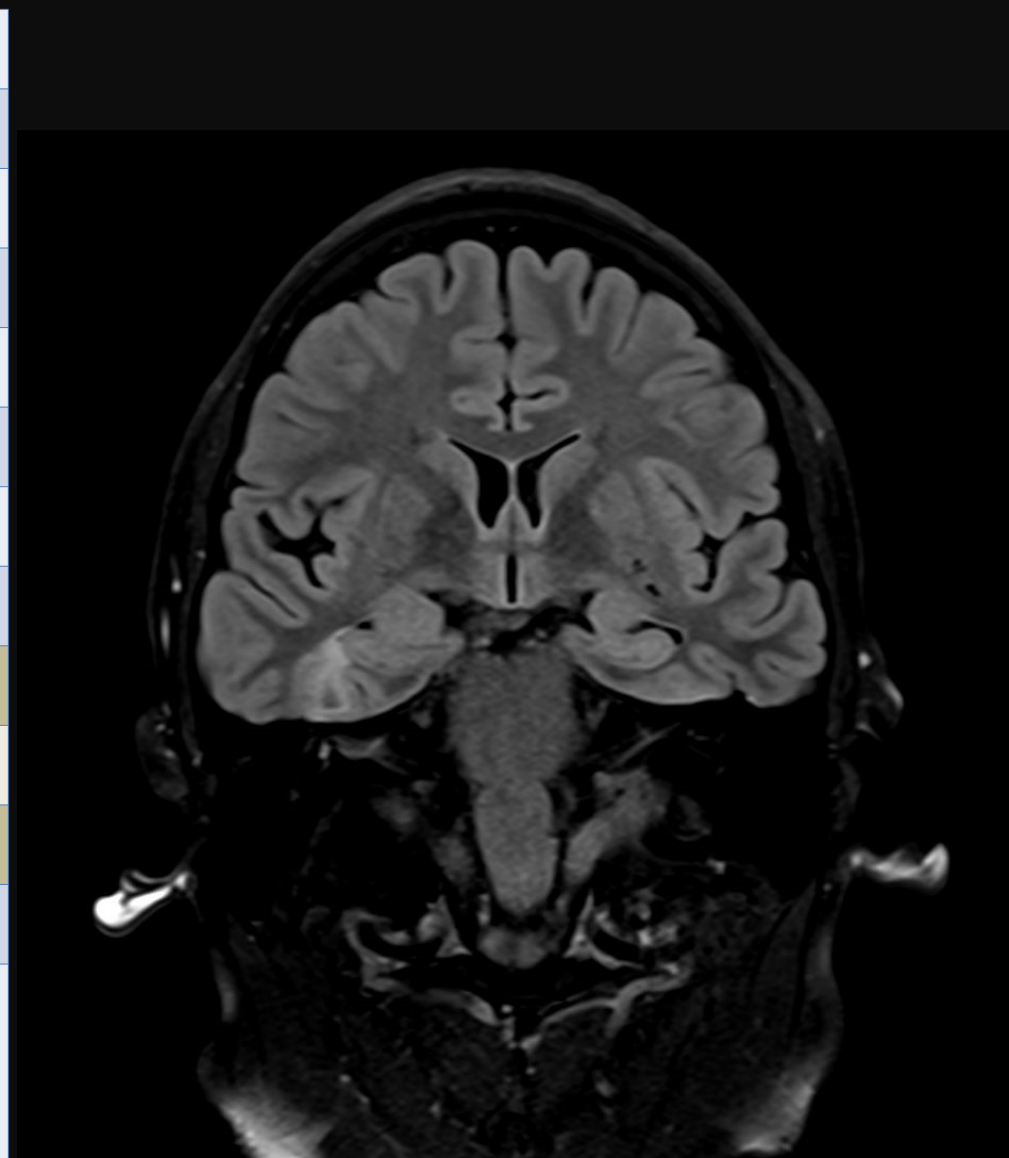
Typ	T2 iso RS
Sekvence	Space da-fl
Rovina	SAG
Vrstva mm	0,9/176/1 slab
FoV mm	240
Matrix	256 x 256 + interp.
Fáze	A-P
PAT	2 GRAPPA
TR ms	5000
TE ms	398
Turbo f.	284
Čas	4:47
Různé	TI 1800 Iso 0,5x0,5x0,9 Conc. 1 Avg 1 Phase overs. 10% BW 781 Interleaved



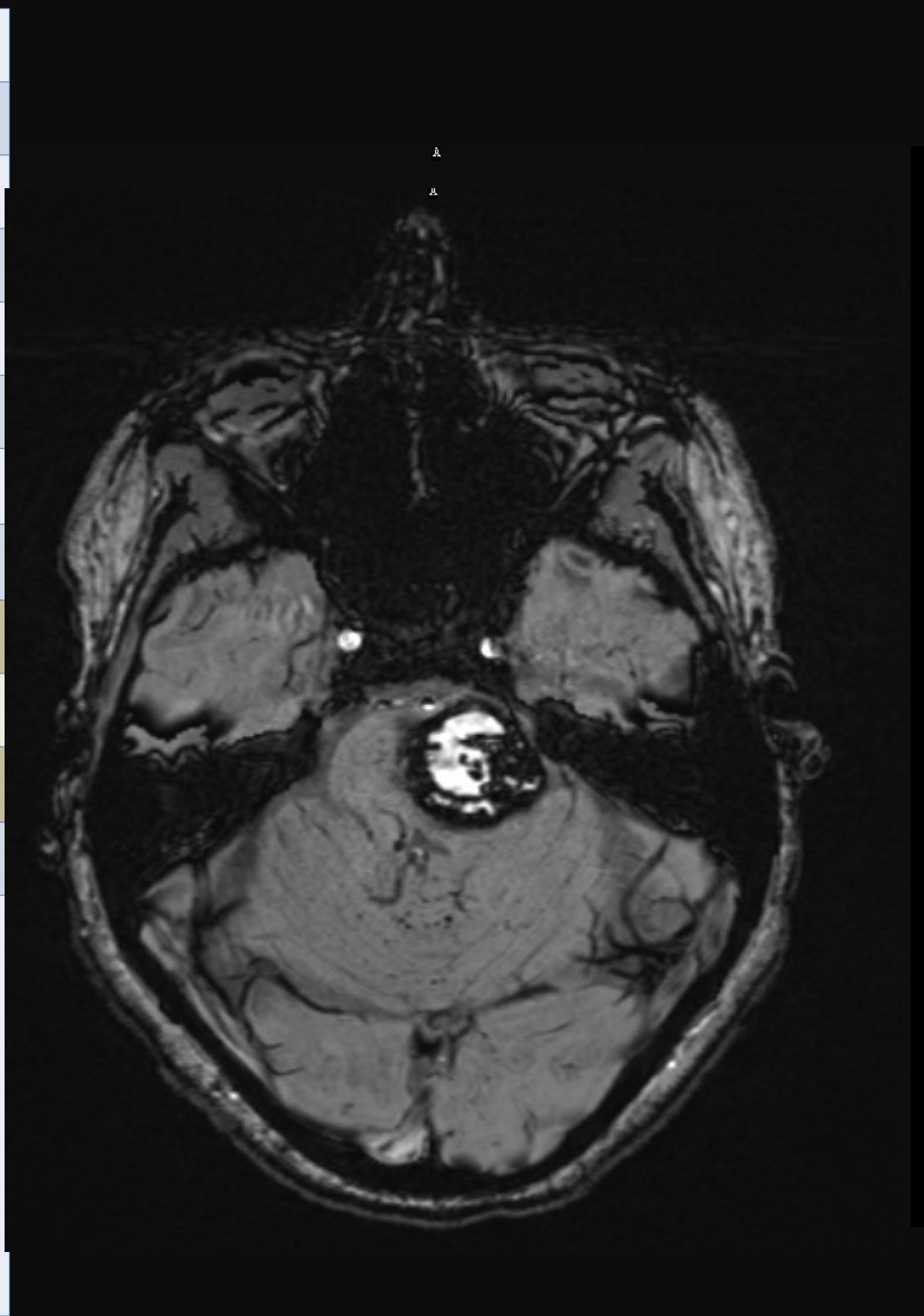
Typ	T2
Sekvence	TSE FS
Rovina	COR
Vrstva mm	2/21 dist 20%
FoV mm	190
Matrix	384 x 288 + interp.
Fáze	R-L
PAT	off
TR ms	4000
TE ms	89
turbo	17
Čas	4:32
Různé	AVG 2 Conc. 2 FS strong FA 150 Phase overs. 20% ETL per sl. 21 BW 260 Interleaved



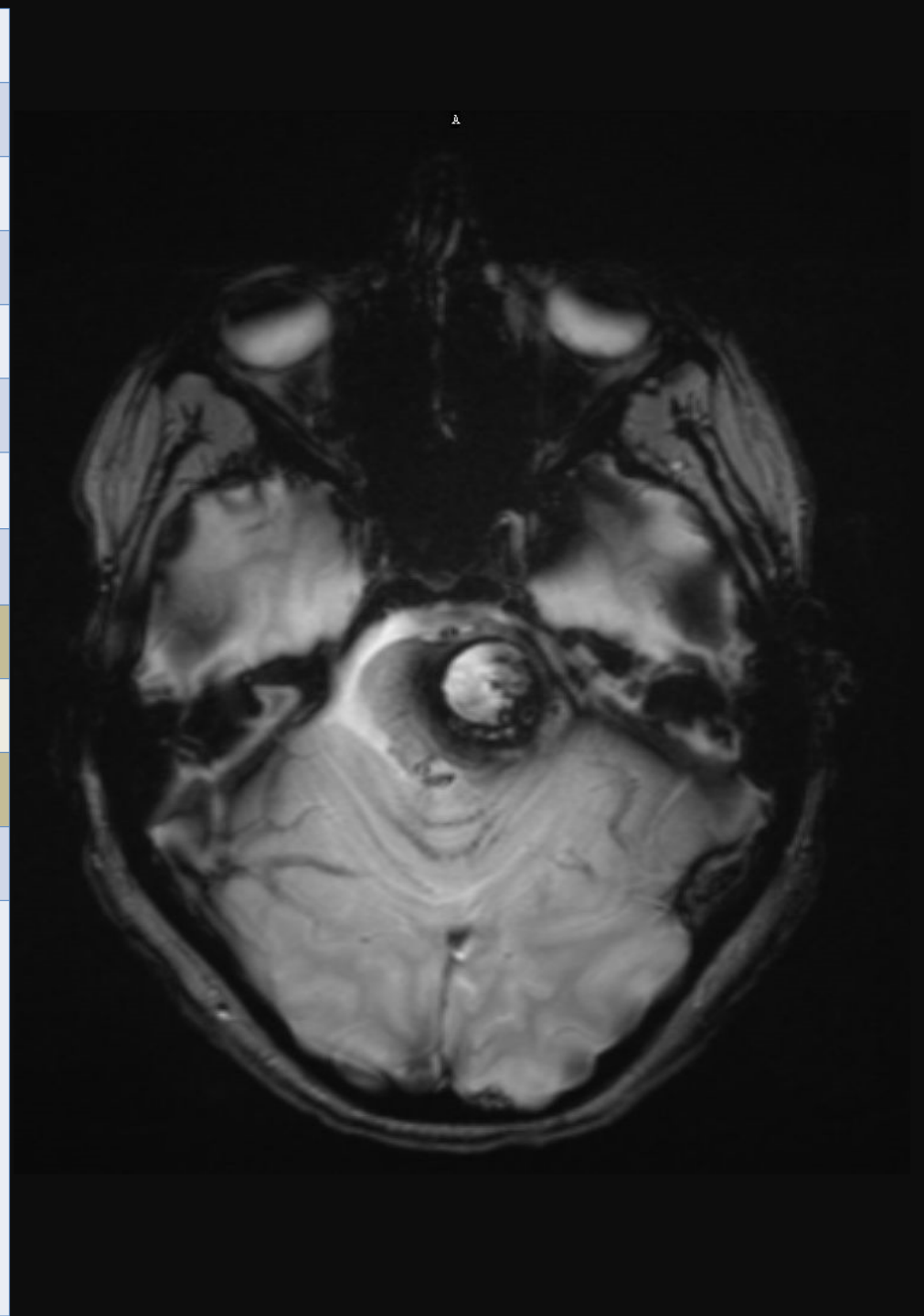
Typ	T2 tirm FLAIR epilepsy
Sekvence	TSE
Rovina	COR
Vrstva mm	3/45 dist 30%
FoV mm	220
Matrix	320 x 217 + interp.
Fáze	R-L
PAT	off
TR ms	9000
TE ms	81
turbo	16
Čas	4:32
Různé	AVG 1 Conc. 2 TI 2500 FA 150 Phase overs. 0% ETL per sl. 14 BW 289 Reduce motion sensit. ON Interleaved



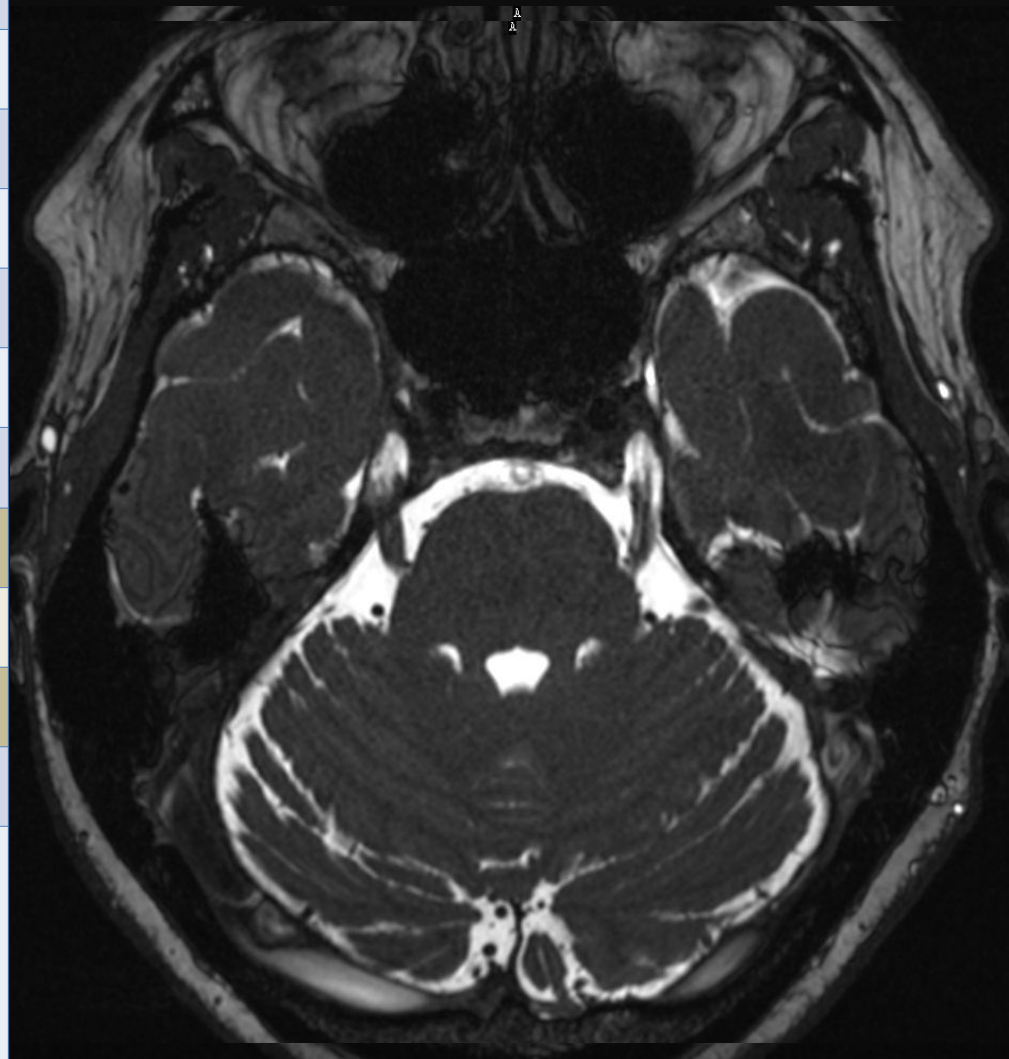
Typ	T2
Sekvence	SWI3d
Rovina	TRA
Vrstva mm	1,5/80/1 slab dist 20%
FoV mm	220
Matrix	220 x 256
Fáze	R-L
PAT	2 GRAPPA
TR ms	27
TE ms	20
Čas	4:54
Různé	0,9x0,9x1,5 AVG 1 Conc. 1 FA 15 Phase overs. 0% BW 120 Interleaved



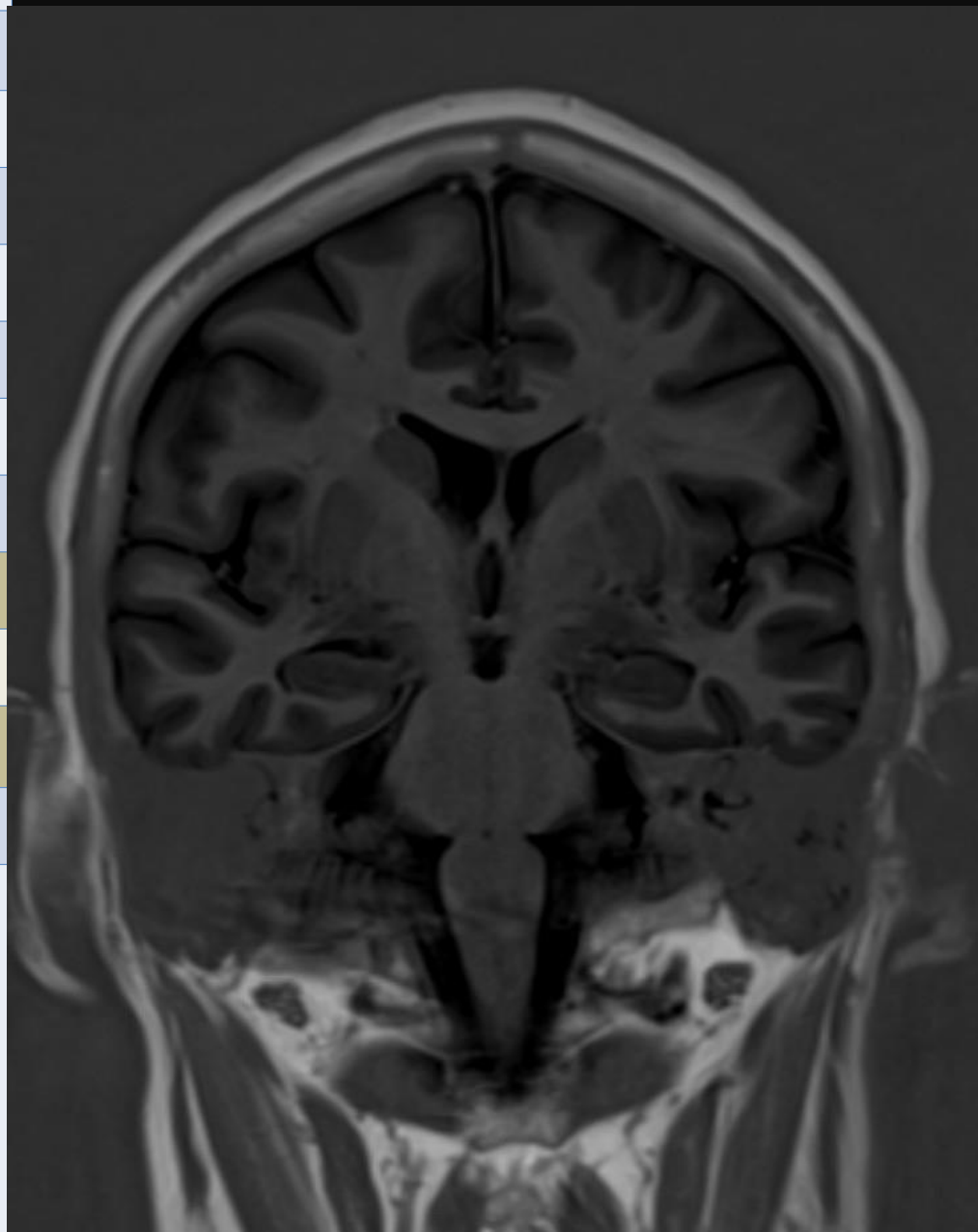
Typ	T2
Sekvence	Fl2d hemo
Rovina	TRA
Vrstva mm	4/25 dist 30%
FoV mm	220
Matrix	320 x 240
Fáze	R-L
PAT	off
TR ms	630
TE ms	19,9
Čas	2:33
Různé	AVG 1 Conc. 1 FA 20 Phase overs. 0% BW 200 Interleaved



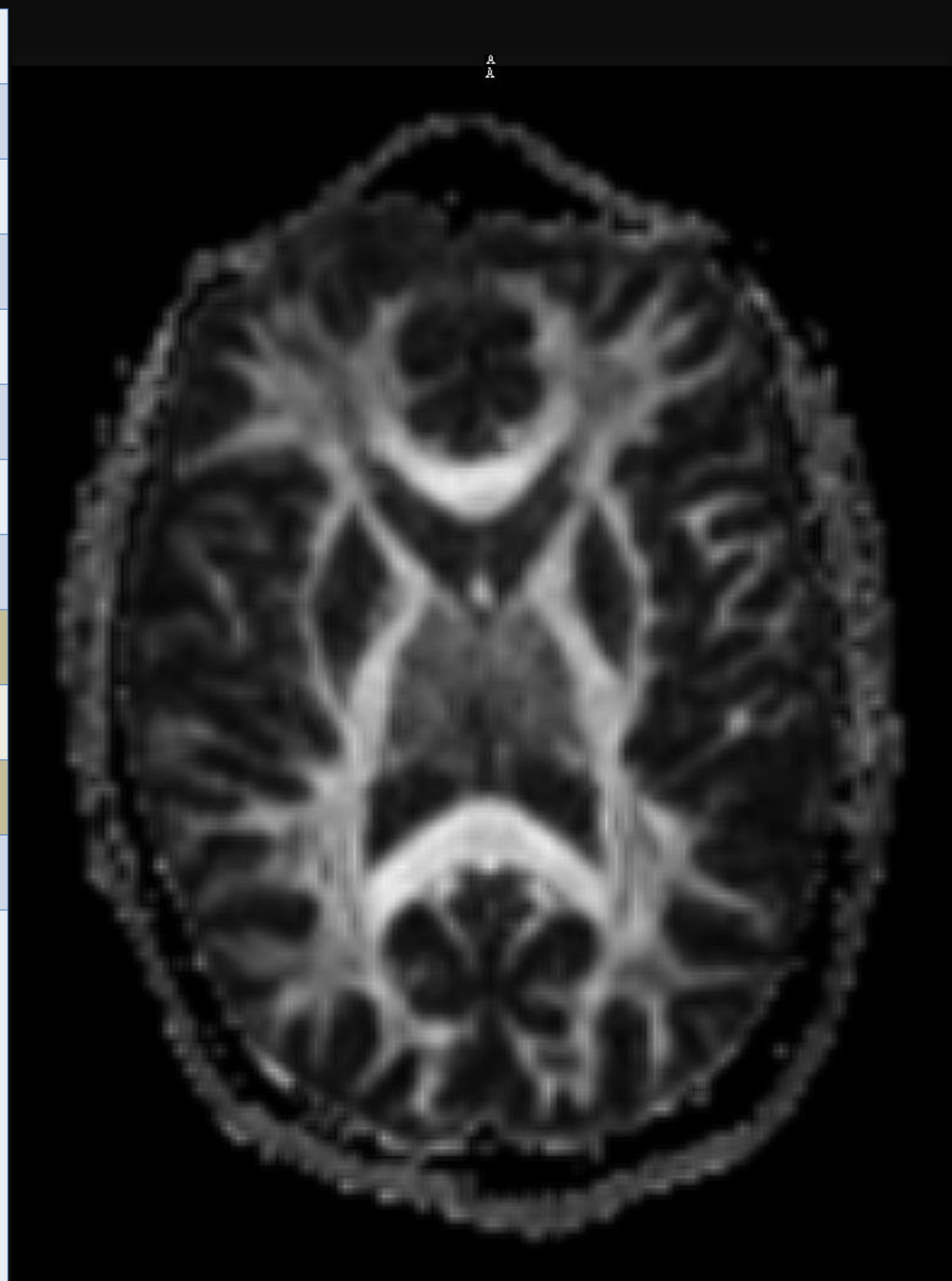
Typ	T2
Sekvence	CISS3d
Rovina	TRA
Vrstva mm	0,5/64/1 slab
FoV mm	150
Matrix	320 x 307 + interp.
Fáze	A-P
PAT	
TR ms	8,56
TE ms	3,91
Turbo f.	
Čas	6:51
Různé	FA 50 Iso 0,2x0,2x0,5 Avg 1 Phase overs. 20% BW 460 Interleaved



Typ	T1
Sekvence	TIR
Rovina	Tra
Vrstva mm	4/28 dist. 30%
FoV mm	220
Matrix	320 x 232
Fáze	R-L
PAT	off
TR ms	2500
TE ms	12
TI	500
Čas	4:02
Různé	Turbo 5 ETL 47 FA 150 Conc. 2 Avg 1 Phase overs. 0% BW 260



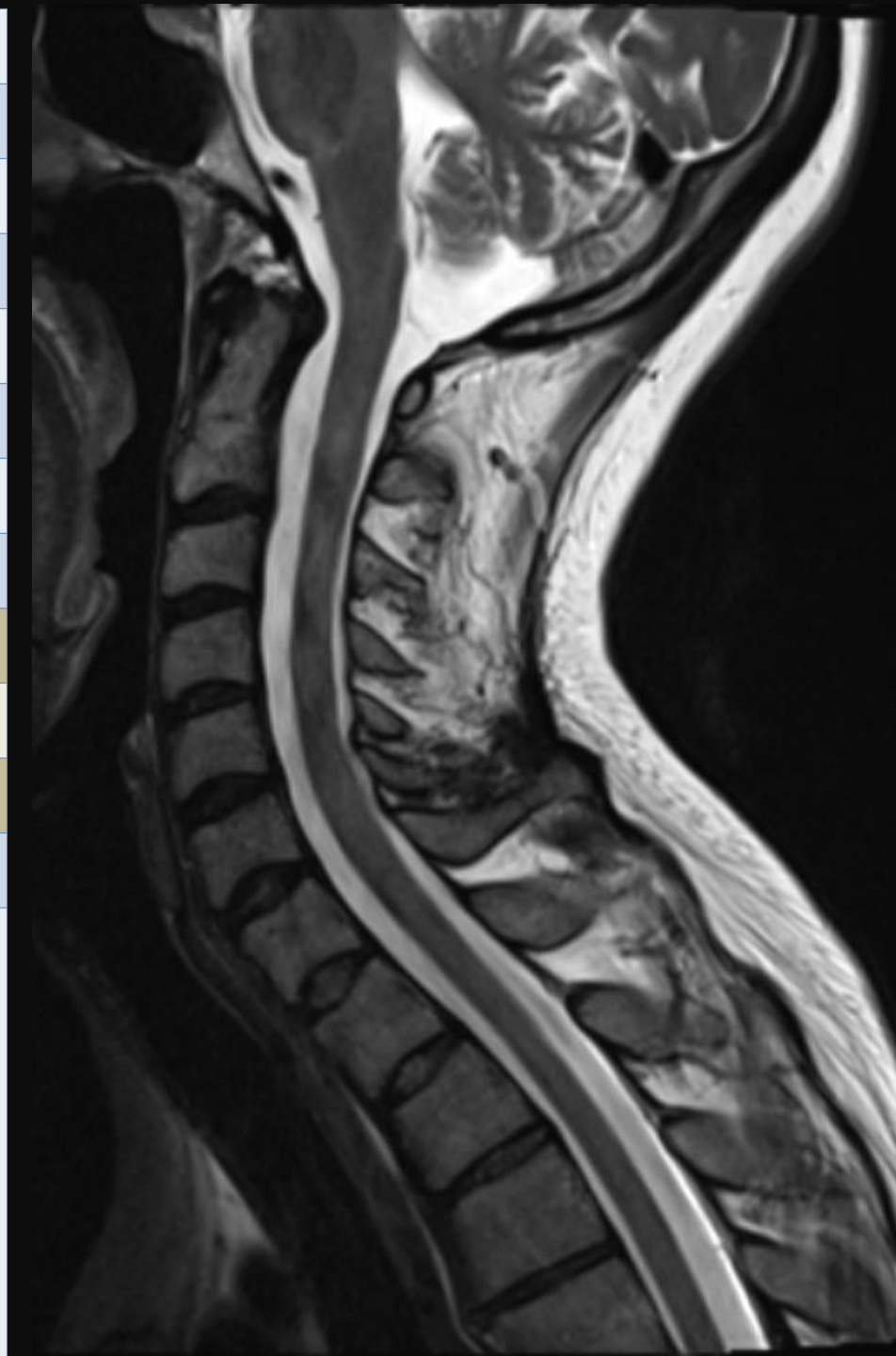
Typ	DWI ep2d
Sekvence	mddw , 20 directions
Rovina	TRA
Vrstva mm	4/27 dist 30%
FoV mm	220
Matrix	158 x 128
Fáze	A-P
PAT	2 GRAPPA
TR ms	3700
TE ms	95
B value	0 , 1000, diff scheme bipolar
Čas	4:06
Různé	Fat sat – weak Conc. 1 Avg. 3 FA 70 Phase overs. 0% BW 1562 Interleaved EPI factor 128



Krční páteř

3 Tesla

Typ	T2
Sekvence	TSE
Rovina	SAG
Vrstva	3/17 dist. 10%
FoV	220
Matrix	384 x 307
Fáze	H-F
PAT	off
TR	3500
TE	106
ETL/turbo	30/19
Čas	1:50
Různé	Phase overs. 80% Avg 1 Conc 1 BW 260 FA 160



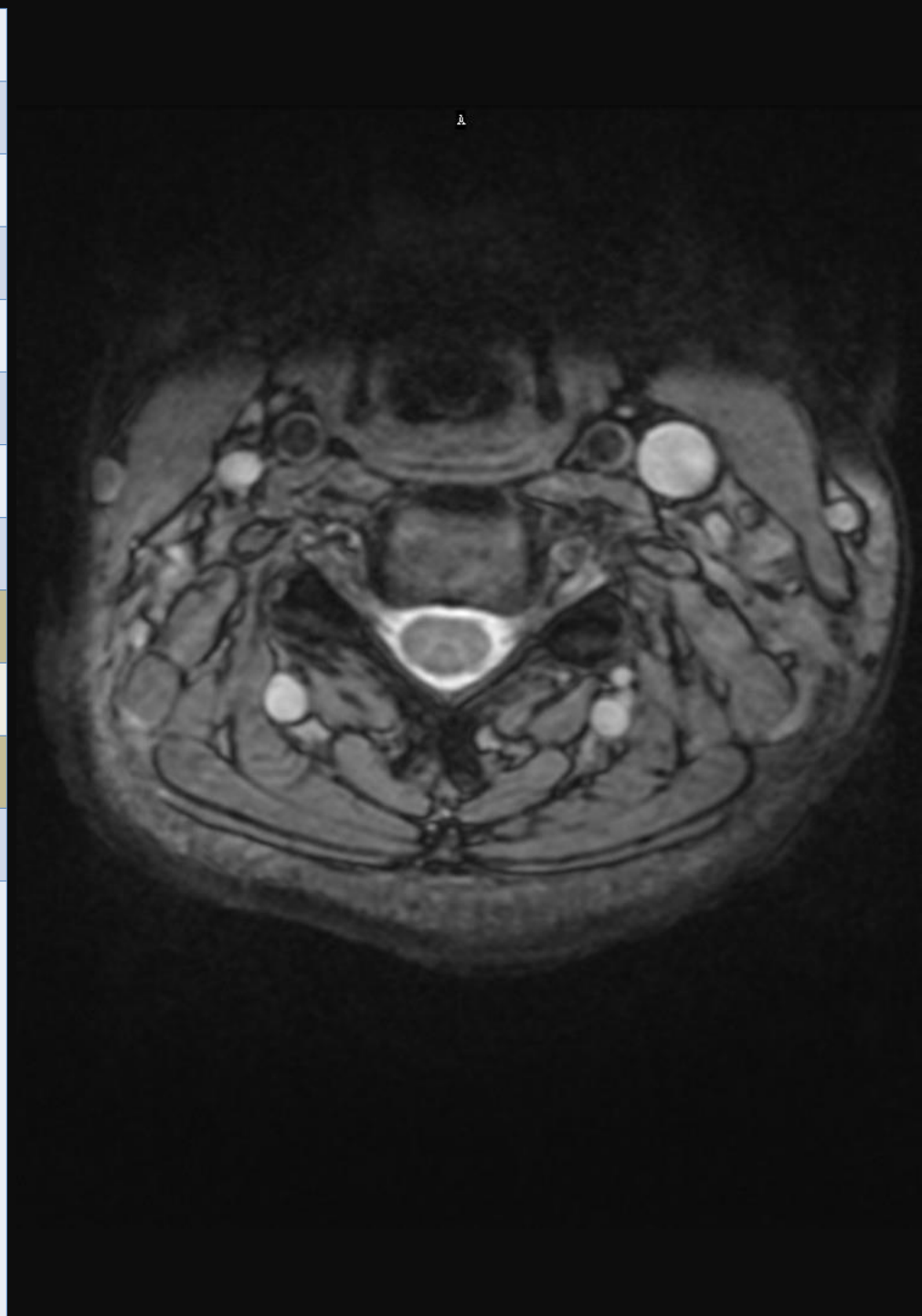
Typ	T1
Sekvence	TSE
Rovina	SAG
Vrstva	3/17 dist. 10%
FoV	220
Matrix	384 x 269
Fáze	H-F
PAT	2
TR	600
TE	9,5
ETL/turbo	61/4
Čas	2:29
Různé	Phase overs. 80% Avg 2 Conc 2 BW 260 FA 160



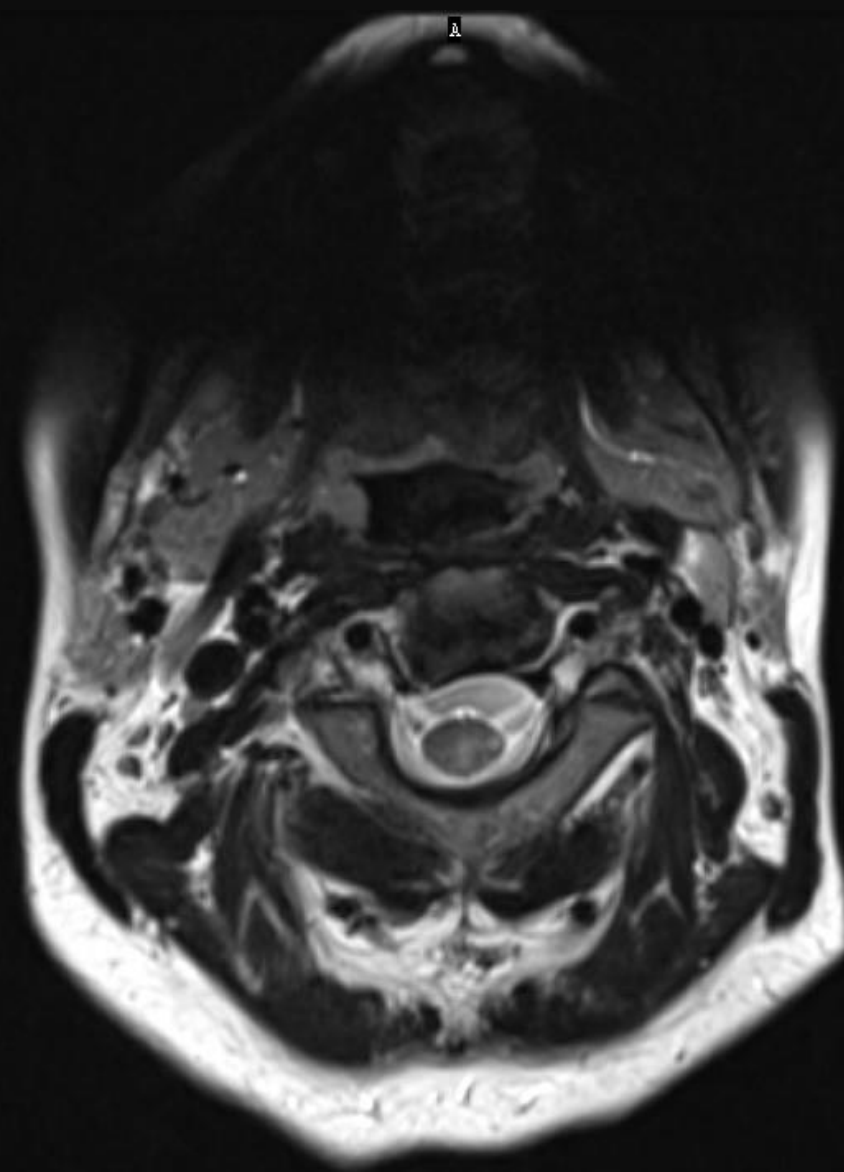
Typ	T2
Sekvence	Tirm
Rovina	SAG
Vrstva	3/17 dist. 10%
FoV	220
Matrix	320 x 240
Fáze	H-F
PAT	2
TR	4000
TE	47
ETL/turbo	15/15
Čas	2:06
Různé	Phase overs. 80% Avg 2 Conc 1 BW 252 FA 160



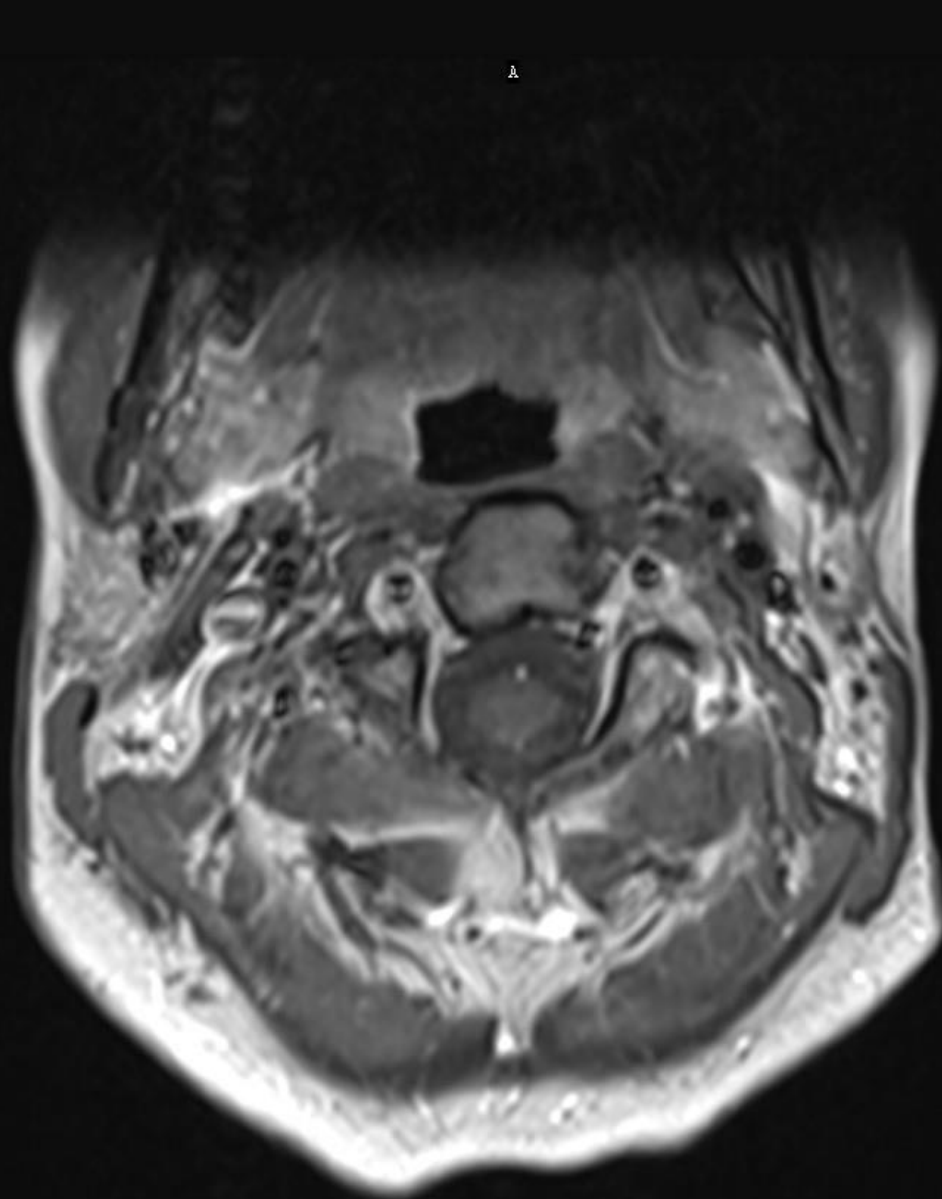
Typ	T2
Sekvence	me2d
Rovina	TRA
Vrstva	3/29 dist. 10%
FoV	180
Matrix	256 x 256
Fáze	A-P +presat
PAT	2
TR	510
TE	14
ETL/turbo	
Čas	4:47
Různé	Phase overs. 0% Avg 2 Conc 2 BW 260 FA 30



Typ	T2
Sekvence	Tse
Rovina	TRA
Vrstva	3/29 dist. 10%
FoV	220
Matrix	384 x 307
Fáze	A-P +presat
PAT	off
TR	3500
TE	106
ETL/turbo	19/30
Čas	3:39
Různé	Phase overs. 80% Avg 1 Conc 2 BW 260 FA 160



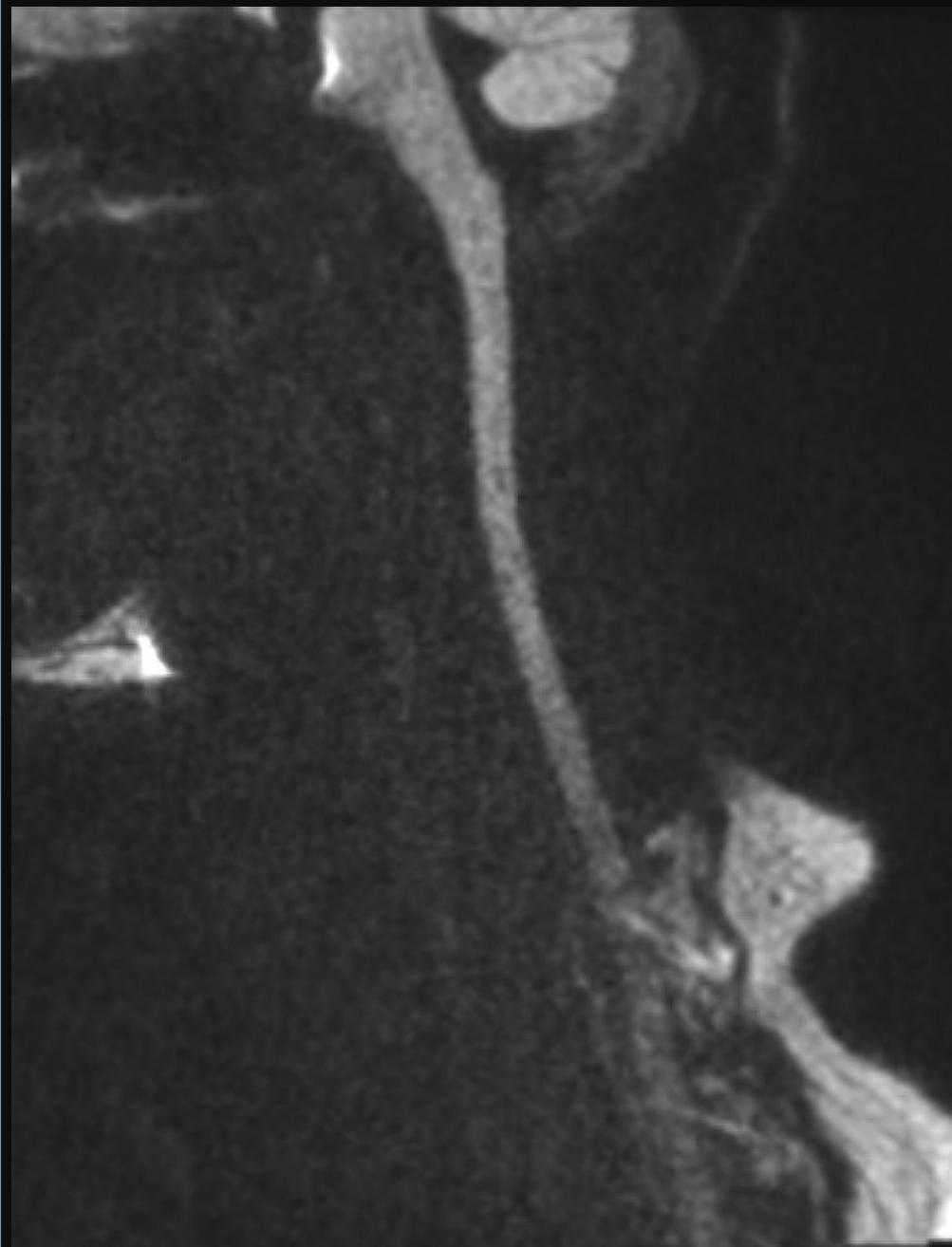
Typ	T1
Sekvence	Tse
Rovina	TRA
Vrstva	3/30 dist. 10%
FoV	180
Matrix	256 x 205
Fáze	A-P +presat
PAT	2
TR	760
TE	11
ETL/turbo	77/2
Čas	3:57
Různé	Phase overs. 50% Avg 2 Conc 2 BW 250 FA 160



Typ	T2 iso
Sekvence	Space da-fl
Rovina	SAG
Vrstva mm	0,8/64/1 slab
FoV mm	250
Matrix	320 x 301 + interp.
Fáze	F-H
PAT	2 GRAPPA
TR ms	1500
TE ms	133
Turbo f.	88
Čas	5:54
Různé	TI 1800 0,4x0,4x0,8 Conc. 1 Avg 1,4 Phase overs. 80% BW 625



Typ	DWI 3scan trace
Sekvence	RESOLVE , 3 directions
Rovina	SAG
Vrstva mm	1,5/27 dist 30%
FoV mm	220
Matrix	224 x 224
Fáze	A-P
PAT	2 GRAPPA
TR ms	5900
TE ms	80
B value	0 , 1000, diff scheme monopolar
Čas	3:40
Různé	Fat sat – strong Conc. 1 Avg. 1 FA 180 Phase overs. 20% BW 657 Interleaved EPI factor 135



Bederní páteř

3 Tesla

Typ	T2
Sekvence	TSE
Rovina	SAG
Vrstva	3/19 dist. 20%
FoV	280
Matrix	384 x 288
Fáze	H-F
PAT	off
TR	3000
TE	101
ETL/turbo	28/21
Čas	2:56
Různé	Phase overs. 100% Avg 1 Conc 2 BW 250



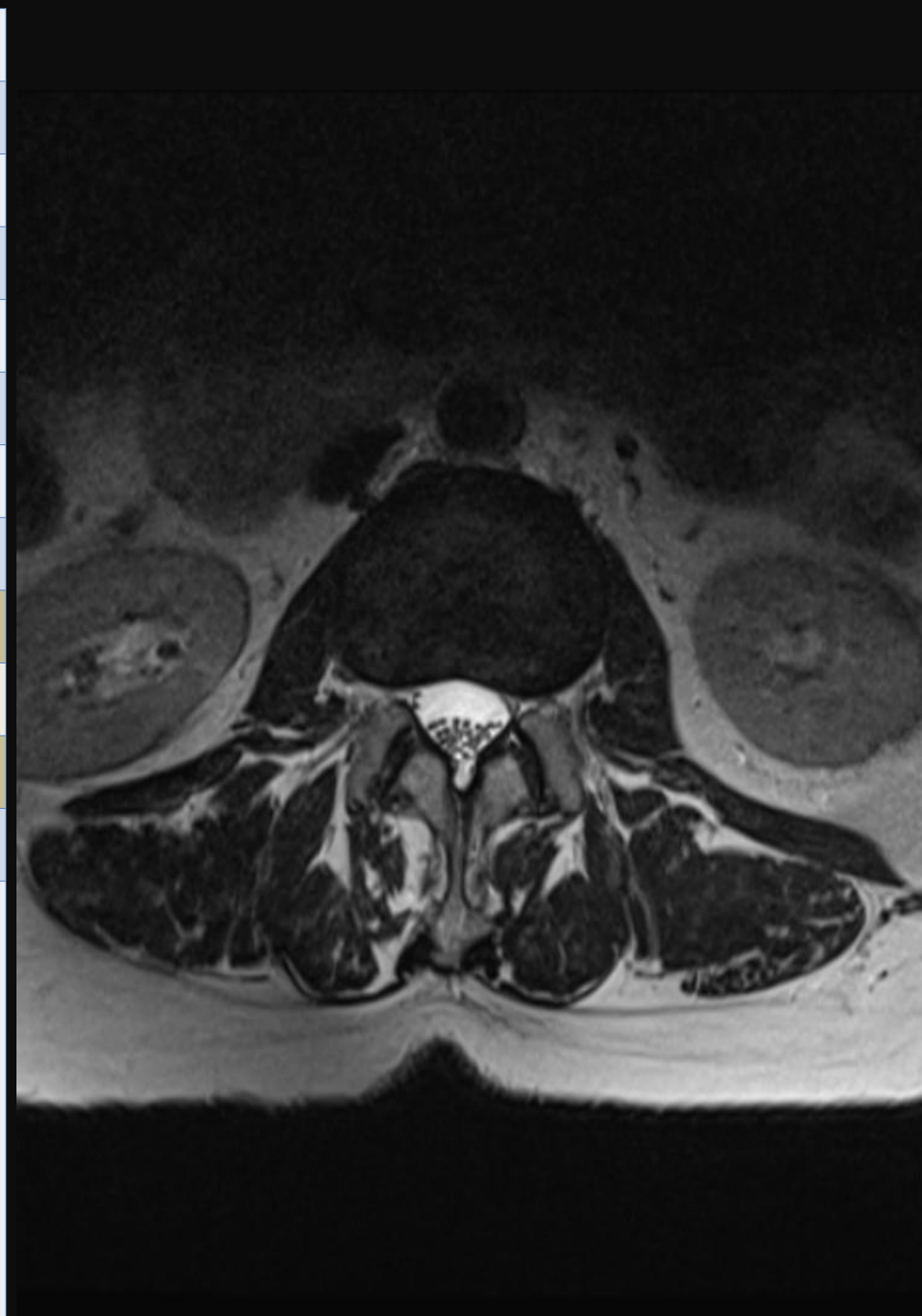
Typ	T1
Sekvence	TSE
Rovina	SAG
Vrstva	3/19 dist. 20%
FoV	280
Matrix	384 x 288
Fáze	H-F
PAT	2
TR	650
TE	9,5
ETL/turbo	52/5
Čas	2:18
Různé	Phase overs. 80% Avg 2 Conc 2 BW 250



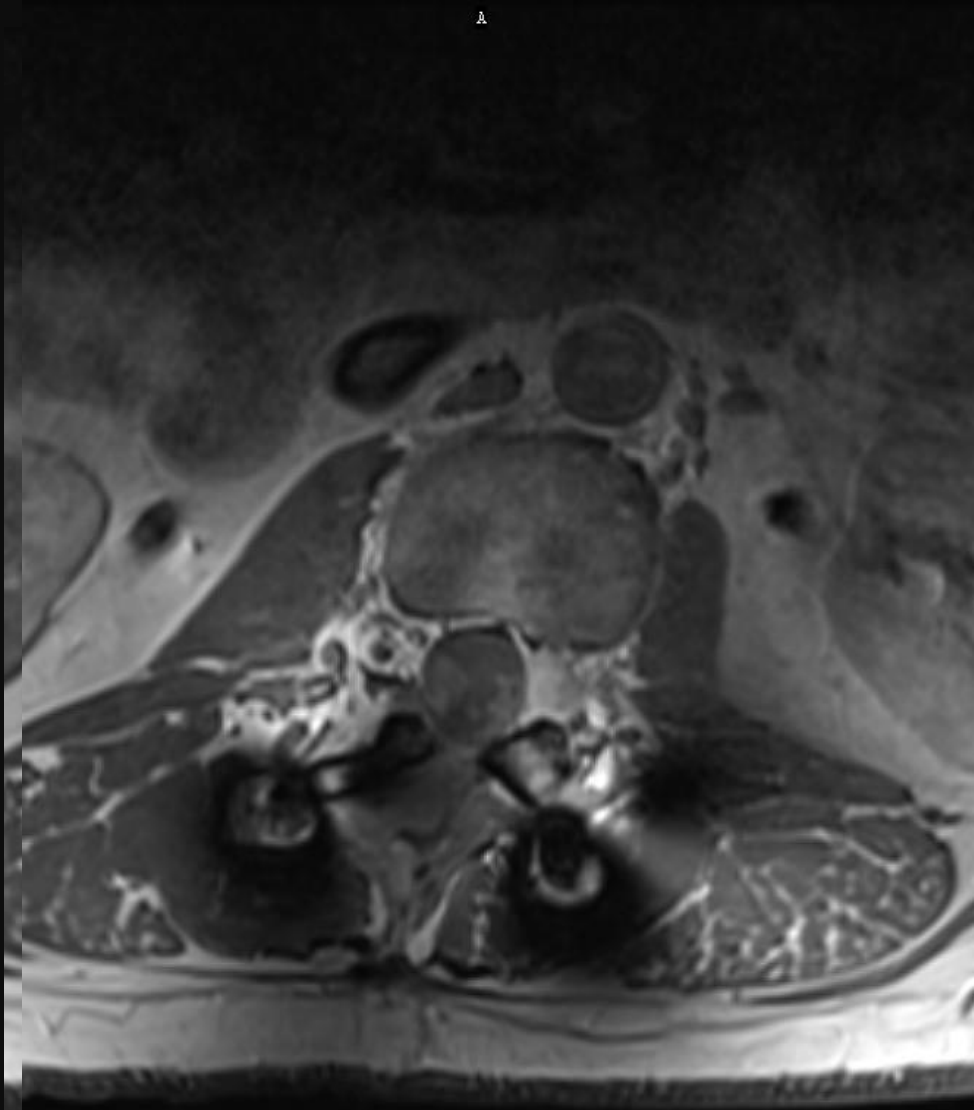
Typ	T2
Sekvence	Tirm
Rovina	SAG
Vrstva	3/19 dist. 20%
FoV	280
Matrix	320 x 240
Fáze	H-F
PAT	2
TR	4030
TE	53
ETL/turbo	15/15
Čas	2:06
Různé	Phase overs. 100% Avg 2 Conc 1 BW 260



Typ	T2
Sekvence	Tse msma
Rovina	TRA
Vrstva	3/3x5 dist. 10%
FoV	220
Matrix	448 x 336
Fáze	A-P +presat
PAT	2
TR	3500
TE	101
ETL/turbo	10/26
Čas	2:29
Různé	Phase overs. 40% Avg 2 Conc 2 BW 254



Typ	T1
Sekvence	Tse msma
Rovina	TRA
Vrstva	3/3x5 dist. 10%
FoV	220
Matrix	320 x 240
Fáze	A-P +presat
PAT	off
TR	600
TE	9
ETL/turbo	112/3
Čas	4:32
Různé	Phase overs. 40% Avg 2 Conc 2 BW 279



Typ	T2
Sekvence	Haste 3D fs - myelo
Rovina	COR
Vrstva	0,6/88 1 slab dist. 50%
FoV	240
Matrix	256 x 256
Fáze	F-H
PAT	off
TR	8000
TE	271
turbo	256
Čas	12:02
Různé	Phase overs. 100% Slice overs. 27% Avg 1 Conc 1 BW 201 0,5x0,5x0,6

