



Neuro MR protokoly

3 Tesla

Klinika JL Praha

Z. Svatá

M. Kynčl

Philips

Achieva Tx series

3T

Mozek - standard

Kontrast	orientace	čas
T1 IR	Sag	3:18
T2	Tra	1:42
T2 FLAIR	Tra	3:18
DWI	Tra	1:06
SWI	Tra	2:28
T1 IR	Cor	2:55
Option		
T2	Sag	1:31
T2 3D Drive IAC	Tra	4:34
T2 Spair orbita	Cor	3:45

32-kanálová hlavová cívka

Kontrastní látka

Kontrast	orientace	čas
T2	Tra	1:42
T2 FLAIR	Tra	3:18
DWI	Tra	1:06
T1 3D TFE	Sag	4:26
T1 3D TFE GD	Sag	4:26

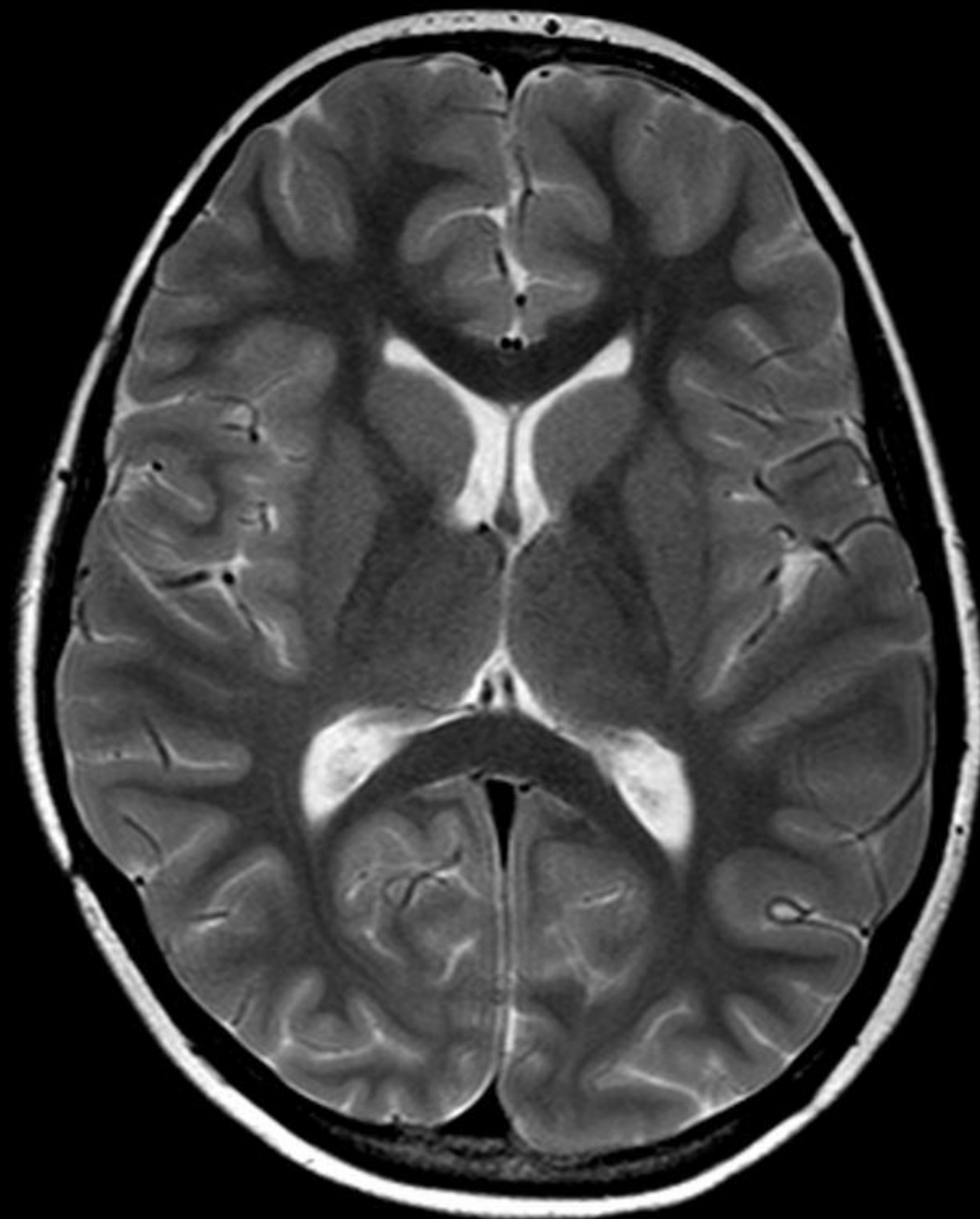
Option

T2	Sag	1:31
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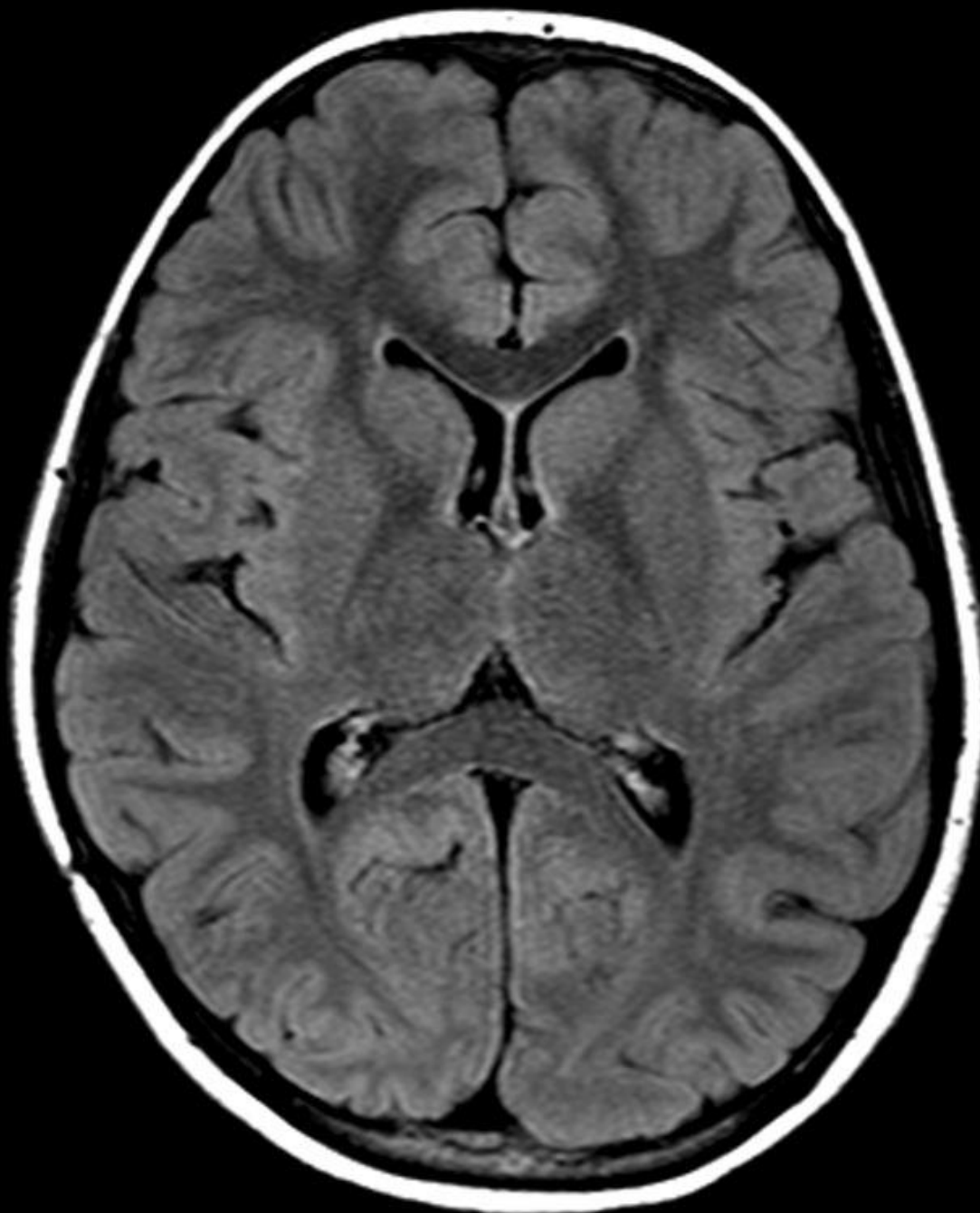
Typ	T1
Sekvence	IR
Rovina	SAG
Vrstva mm	4
FoV mm	230
Matrix	308 x 287
Fáze	AP
SENSE	1,8
TR ms	2000
TE ms	7,4 (Shortest)
TSE factor	5
Čas	3:18
Různé	NSA 1 TI 800 Adaptive Slices 24



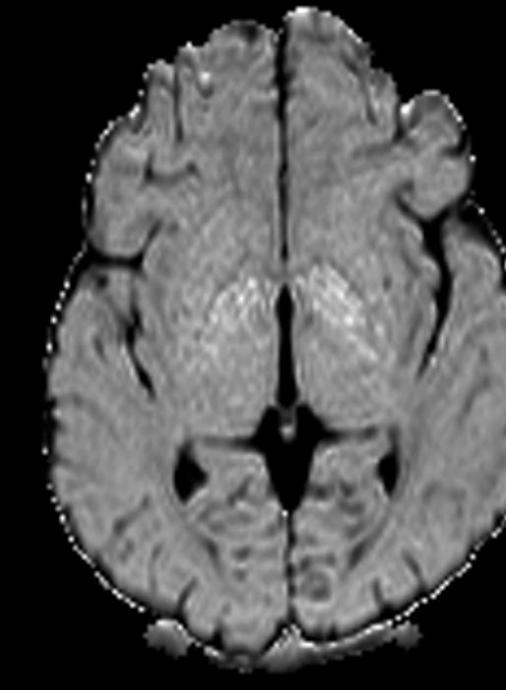
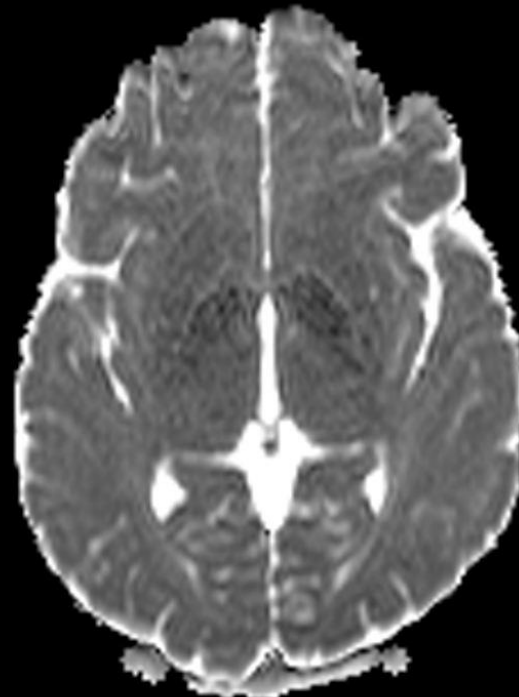
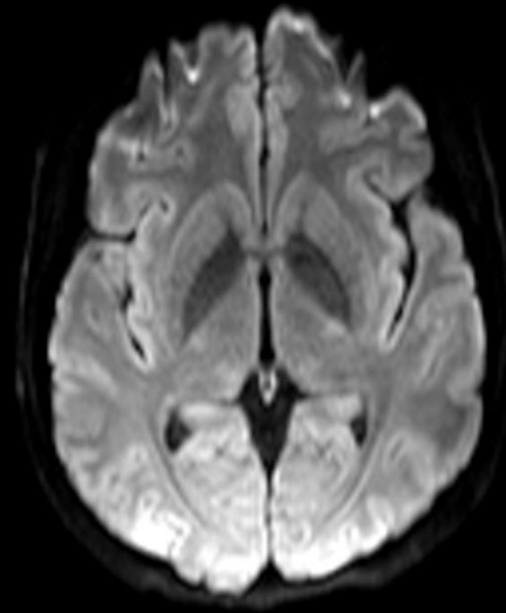
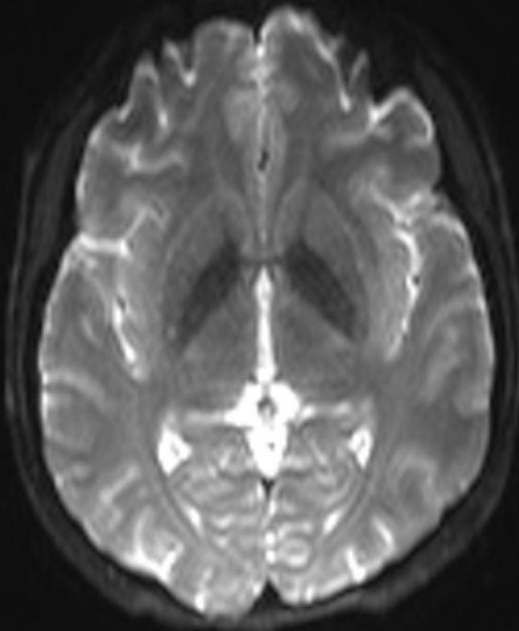
Typ	T2
Sekvence	TSE
Rovina	TRA
Vrstva mm	4
FoV mm	230 x 190
Matrix	412 x 263Voxel 0,57x0,73x4
Fáze	RL
SENSE	1,1
TR ms	3000-4000
TE ms	80
TSE factor	15
Čas	1:42
Různé	NSA 1 Adaptive Slices 28 Voxel 0,57*0,73*4



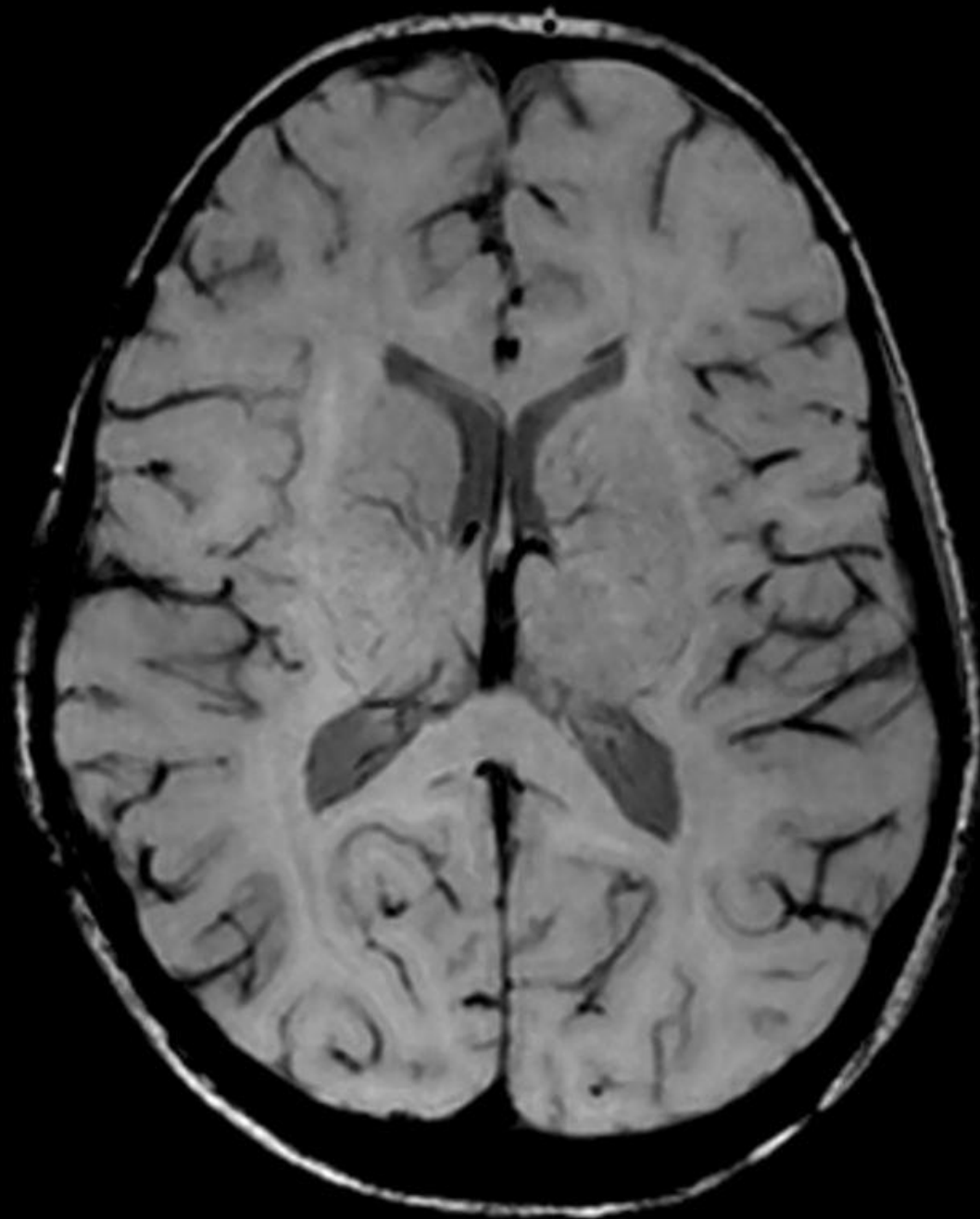
Typ	FLAIR
Sekvence	TSE
Rovina	TRA
Vrstva mm	4
FoV mm	230 x190
Matrix	360 x 207 Voxel 0,66*0,92*4
Fáze	RL
SENSE	1,3
TR ms	11000
TE ms	125
TSE factor	32
Čas	3:18
Různé	NSA 1 TI 2800 ms Adaptive Slices 28 Packages 3



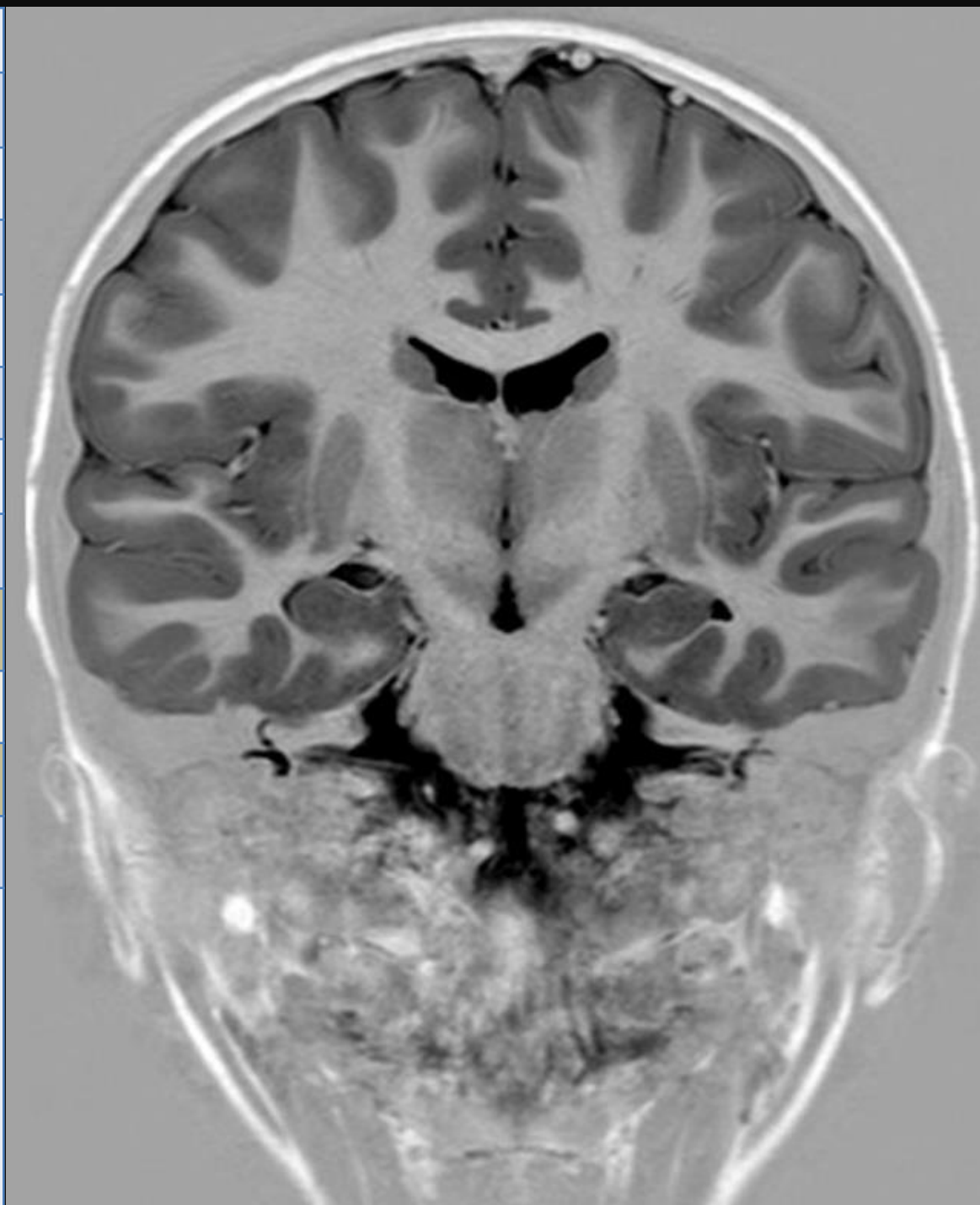
Typ	DWI
Sekvence	EPI
Rovina	TRA
Vrstva mm	4
FoV mm	230
Matrix	152 x 106
Fáze	AP
SENSE	2
TR ms	3175 (Shortest)
TE ms	76 (Shortest)
Čas	1:06
Různé	NSA 2 2b factors 0, 1000 SPIR



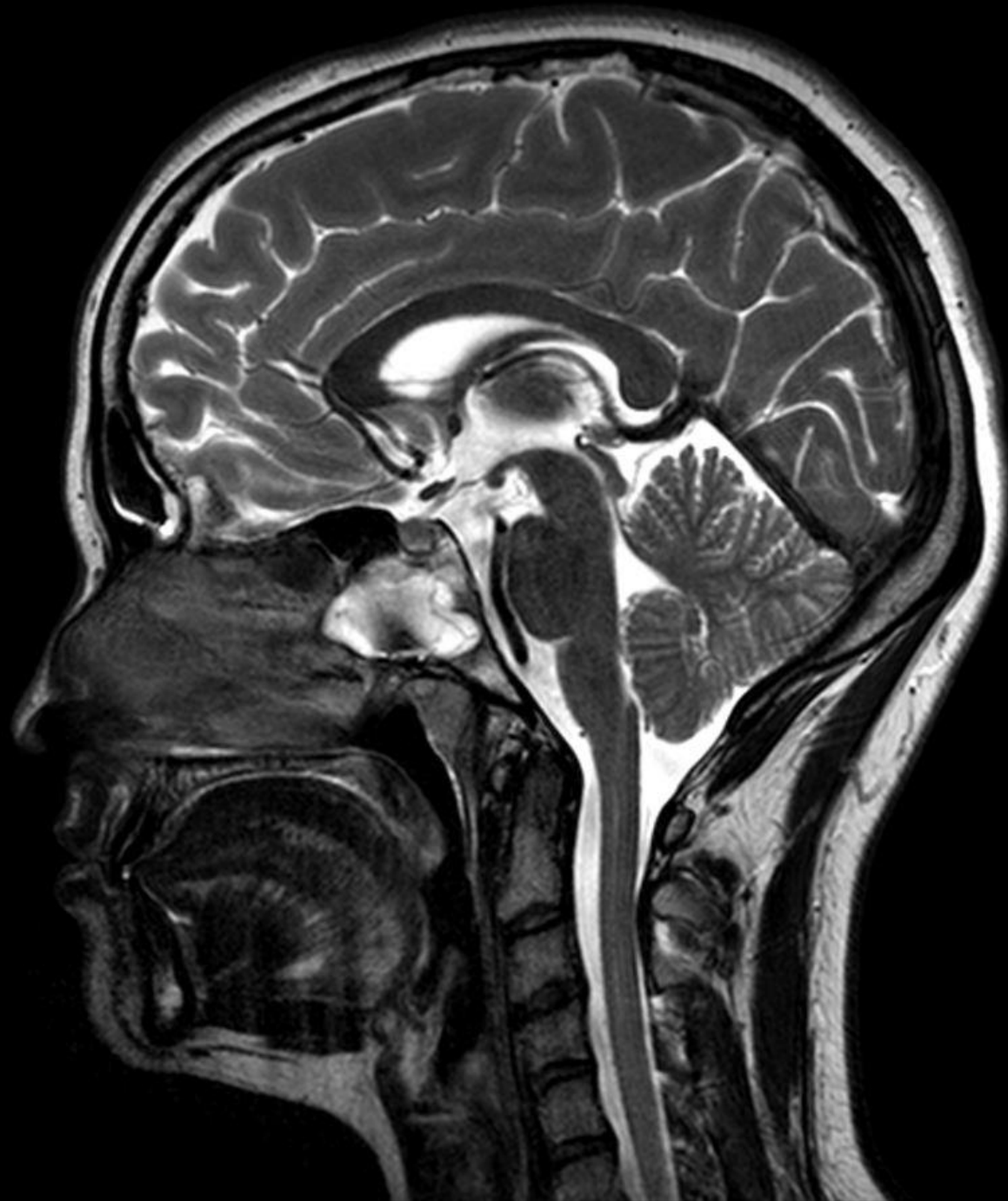
Typ	VenBold
Sekvence	FFE 3D
Rovina	TRA
Voxel size mm	0,9 x 0,9 x 2
FoV mm	230 x 183
Matrix	256 x 204
Fáze	RL
SENSE	RL 2, FH 1
TR ms	16 (Shortest)
TE ms	23 (Shortest)
Čas	2:28
Různé	NSA 1 Adaptive Slices 145



Typ	T1
Sekvence	IR
Rovina	COR
Vrstva mm	4
FoV mm	240 x 180
Matrix	424 x 244
Fáze	RL
SENSE	1,8
TR ms	4167 (Shortest)
TE ms	15
TSE factor	5
Čas	2:55
Různé	NSA 1 TI 400 Adaptive Slices 30 Fold Over suppression YES



Typ	T2
Sekvence	TSE
Rovina	SAG
Vrstva mm	3
FoV mm	270 x 214
Matrix	388 x 296
Fáze	AP
SENSE	off
TR ms	2500 - 4000
TE ms	100
TSE factor	22
Čas	1:31
Různé	NSA 1 Adaptive Drive YES Slices 25



Typ	T1
Sekvence	TFE 3D
Rovina	SAG
Voxel size mm	1 x 1 x 1
FoV mm	240
Matrix	240 x 240
Fáze	AP
SENSE	AP 1, RL 2,2
TR ms	8,1 (Shortest)
TE ms	3,7 (Shortest)
TFE factor	240
Čas	4:26
Různé	NATIV + KL Adaptive Slices 160 OverSampleF 1,2

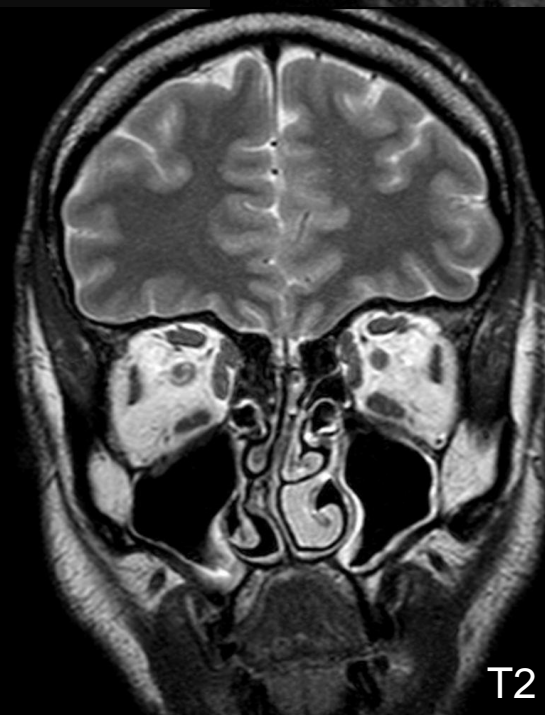


MozeK - orbita

Typ	T2 SPAIR	T2 mDixon
Sekven ce	TSE	TSE
Rovina	COR	COR
Vrstva mm	2,5	2,5
FoV mm	180 x 150	180 x 150
Matrix	276 x 179	256 x 164
Fáze	RL	RL
SENSE	off	off
TR ms	3000	3000
TE ms	80	80
TSE factor	15	15
Čas	3:45	3:30
Různé	Slices 27 Fat s	Slices 27



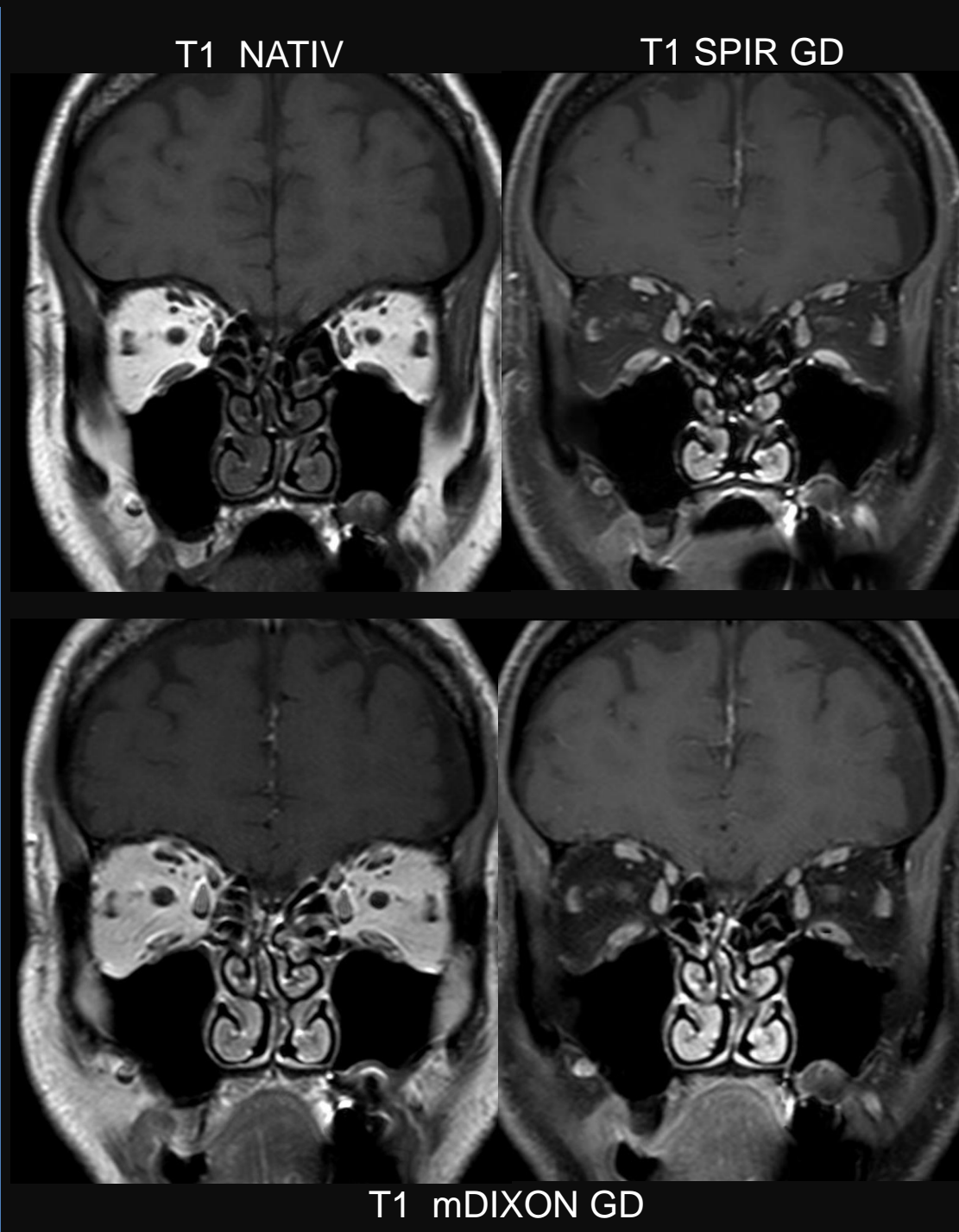
T2 SPAIR



T2 mDIXON

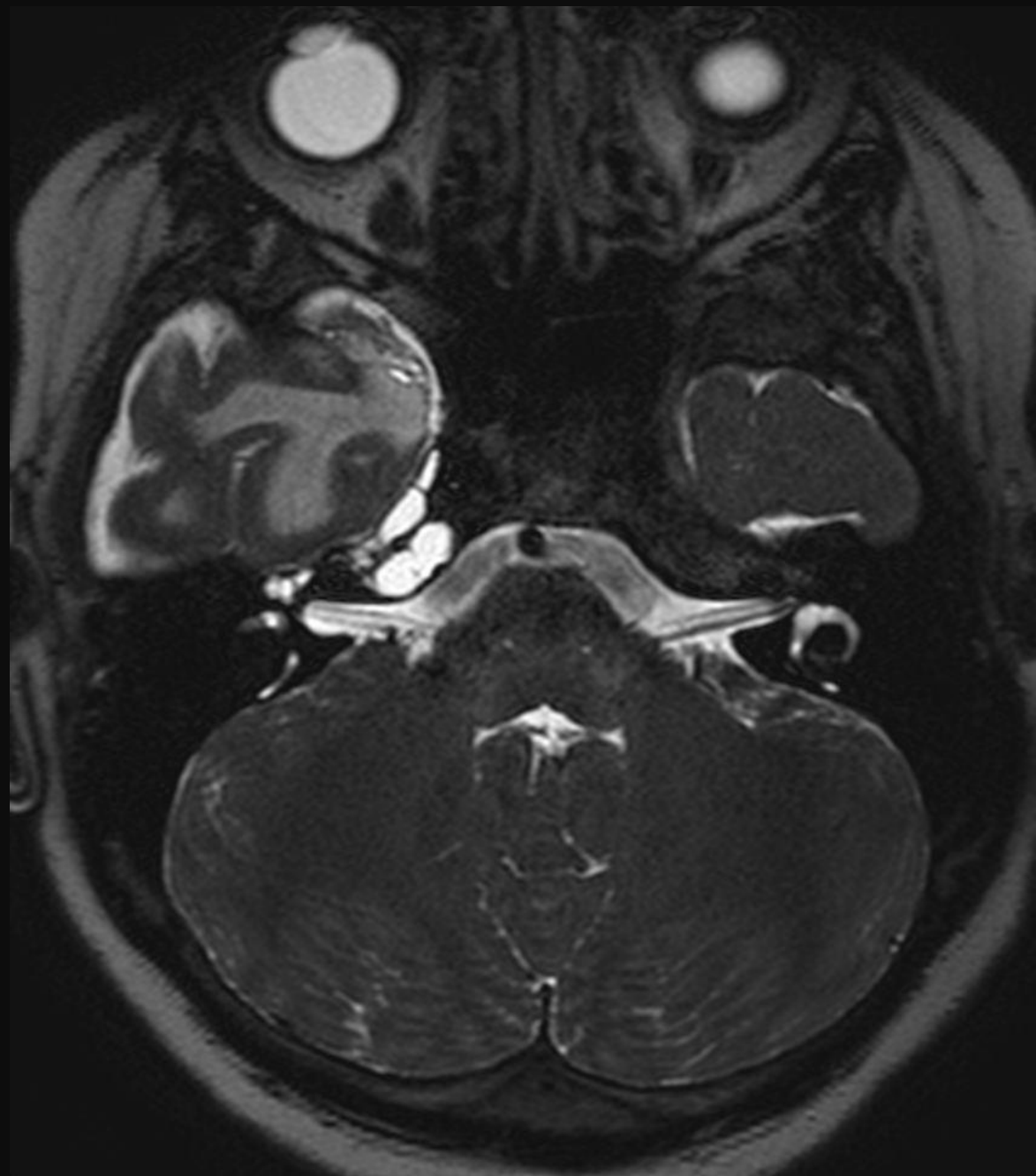


Typ	T1 SPIR	T1 mDixon
Sekvence	TSE	TSE
Rovina	COR	COR
Vrstva mm	3	3
FoV mm	150 x 160	150 x 160
Matrix	168 x 144	188 x 155
Fáze	RL	RL
SENSE	off	1,5
TR ms	450 - 650	450 - 650
TE ms	10	10
TSE factor	3	3
Čas	4:02	4:15
Různé	NSA 3 KL Slices 24	NSA 1,5 NATIV + KL Slices 24



MozeK - IAC - tok

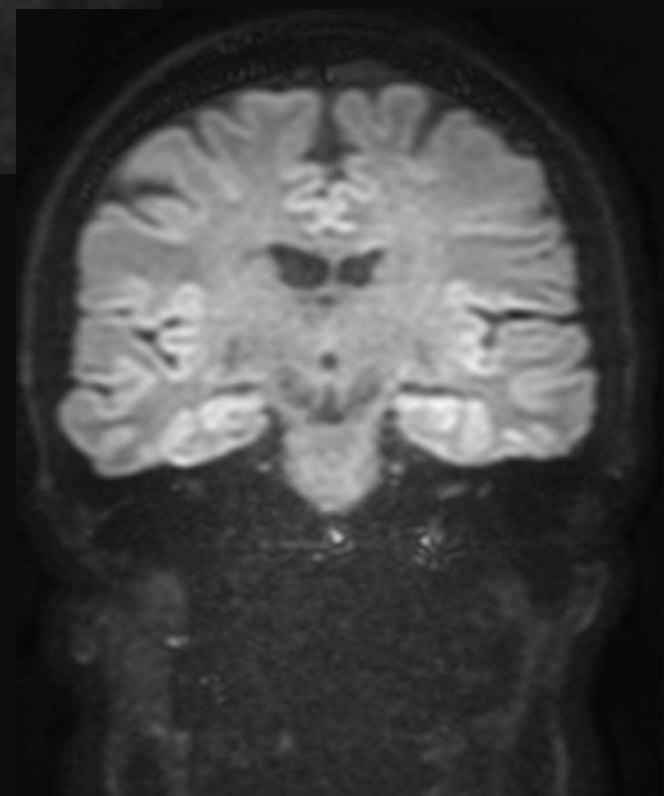
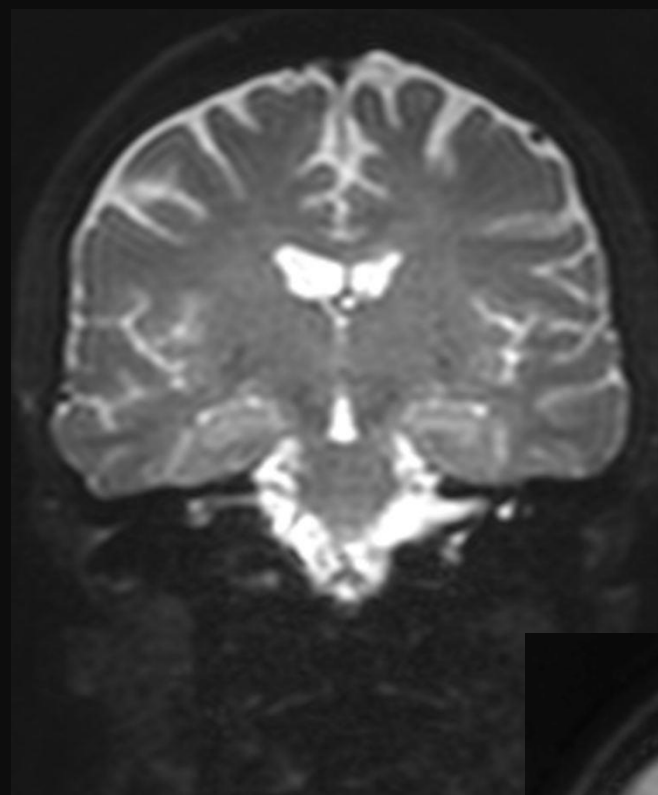
Typ	T2 Drive
Sekvence	TSE 3D
Rovina	TRA
Voxel size mm	0,59 x 0,59 x 1
FoV mm	150
Matrix	300 x 255
Fáze	RL
SENSE	RL 2 FH 1
TR ms	2000
TE ms	193 (Shortest)
TSE factor	56
Čas	4:34
Různé	NSA 1



Typ	T2 CSF DRIVE
Sekvence	TSE 3D
Rovina	SAG
Voxel size mm	2
FoV mm	230
Matrix	400 x 393 Voxel 0,57x0,57x2
Fáze	AP
SENSE	off
TR ms	1600
TE ms	200
TSE factor	57
Čas	1:13
Různé	DRIVE



Typ	DWI
Sekvence	TSE
Rovina	COR
Voxel size mm	1,77 x 2,1 x 3
FoV mm	220 X 185
Matrix	124 x 88
Fáze	RL
SENSE	2
TR ms	6800 (Shortest)
TE ms	58 (Shortest)
TSE factor	
Čas	4:35
Různé	NSA 4 Spir Slices 20 2b factors 0, 1000

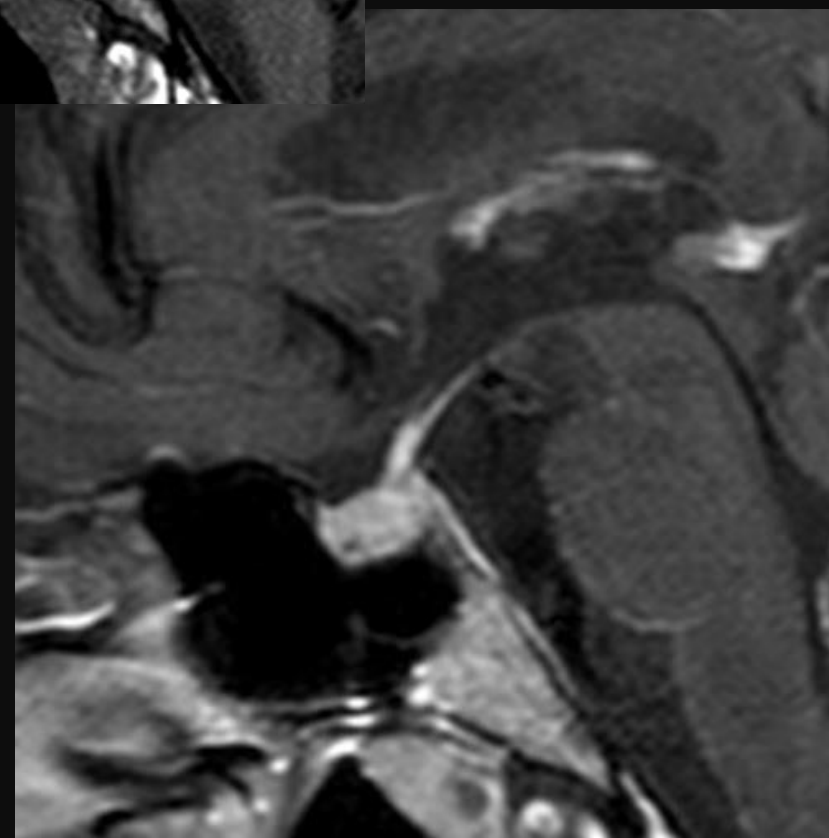
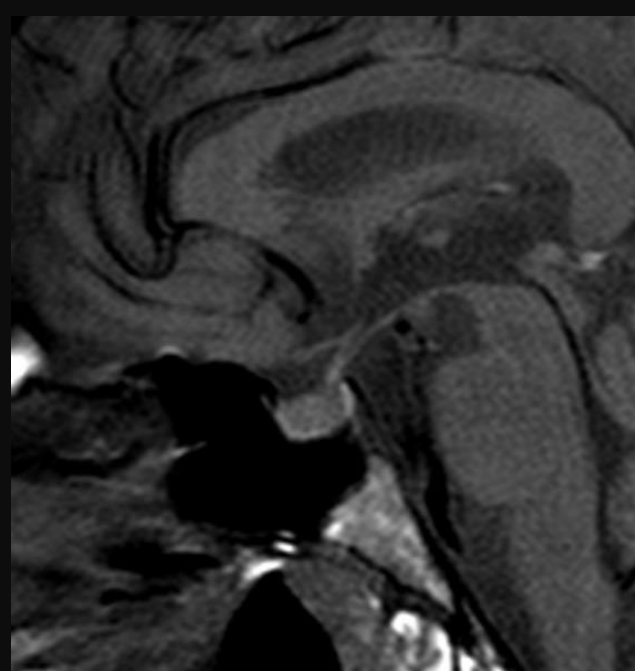


Hypofýza

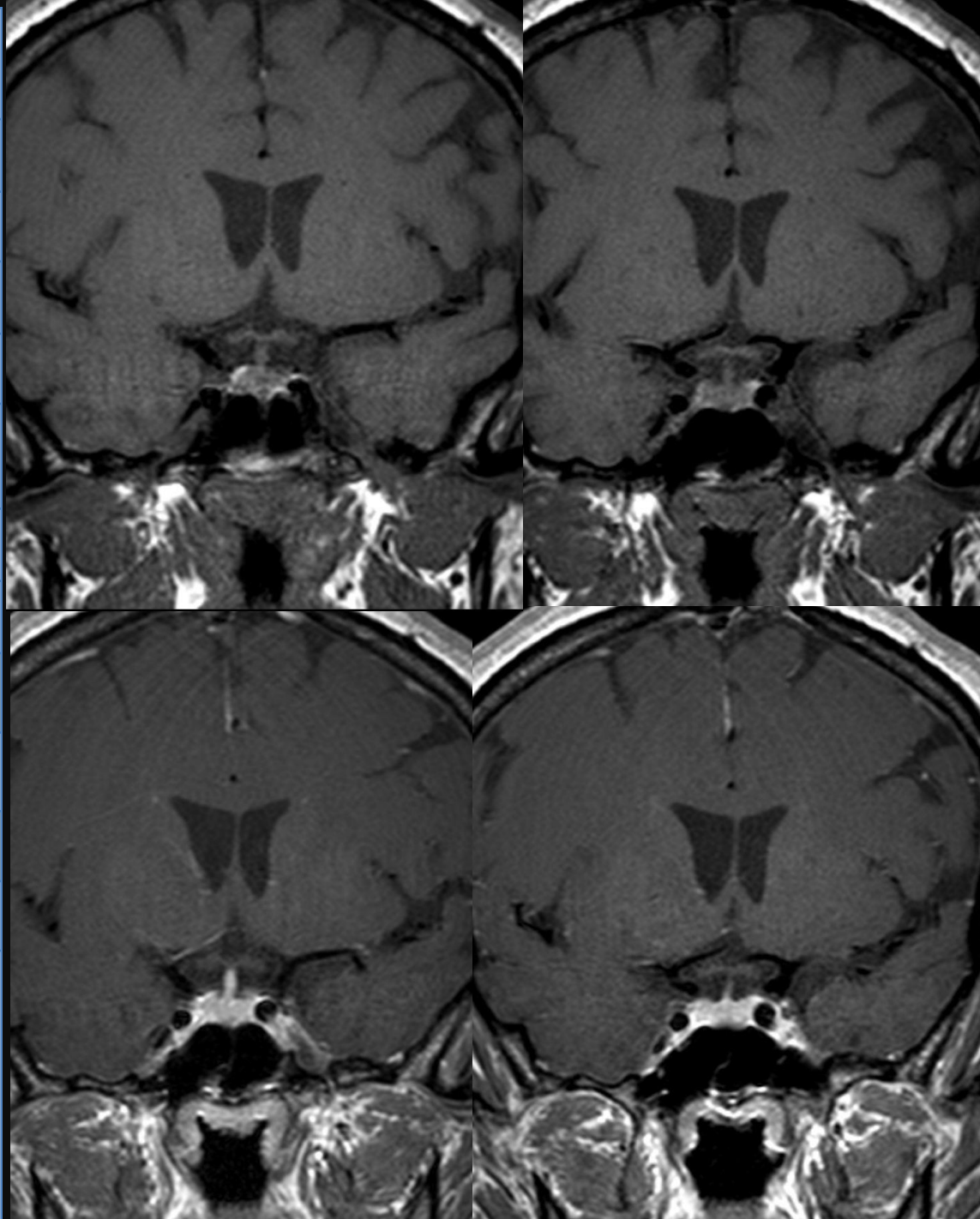
32-kanálová hlavová cívka

Kontrast	orientace	čas
T2	Tra	1:42
T2 FLAIR	Tra	3:18
DWI	Tra	1:06
T1	Sag	3:52
T1	Cor	2:35
T2	Cor	1:30
T1 dynamika	Cor	2:33 Dyn 8''
T1 GD	Sag	3:52
T1 GD	Cor	2:35

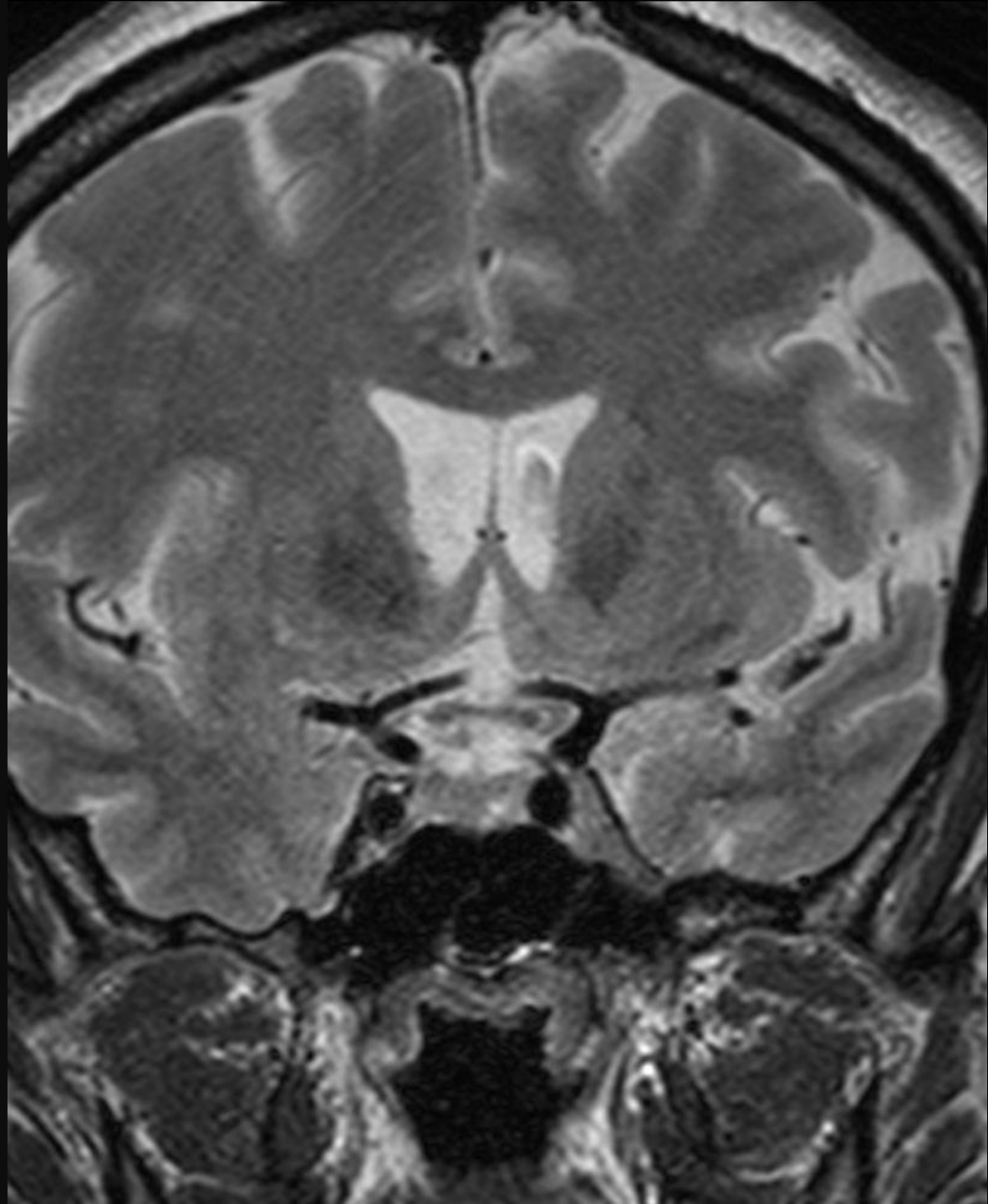
Typ	T1
Sekvence	TSE
Rovina	SAG
Voxel size mm	2
FoV mm	150
Matrix	208 x 164
Fáze	AP
SENSE	1,5
TR ms	550
TE ms	10
TSE factor	3
Čas	3:52
Různé	NSA 2,5 Slices 13



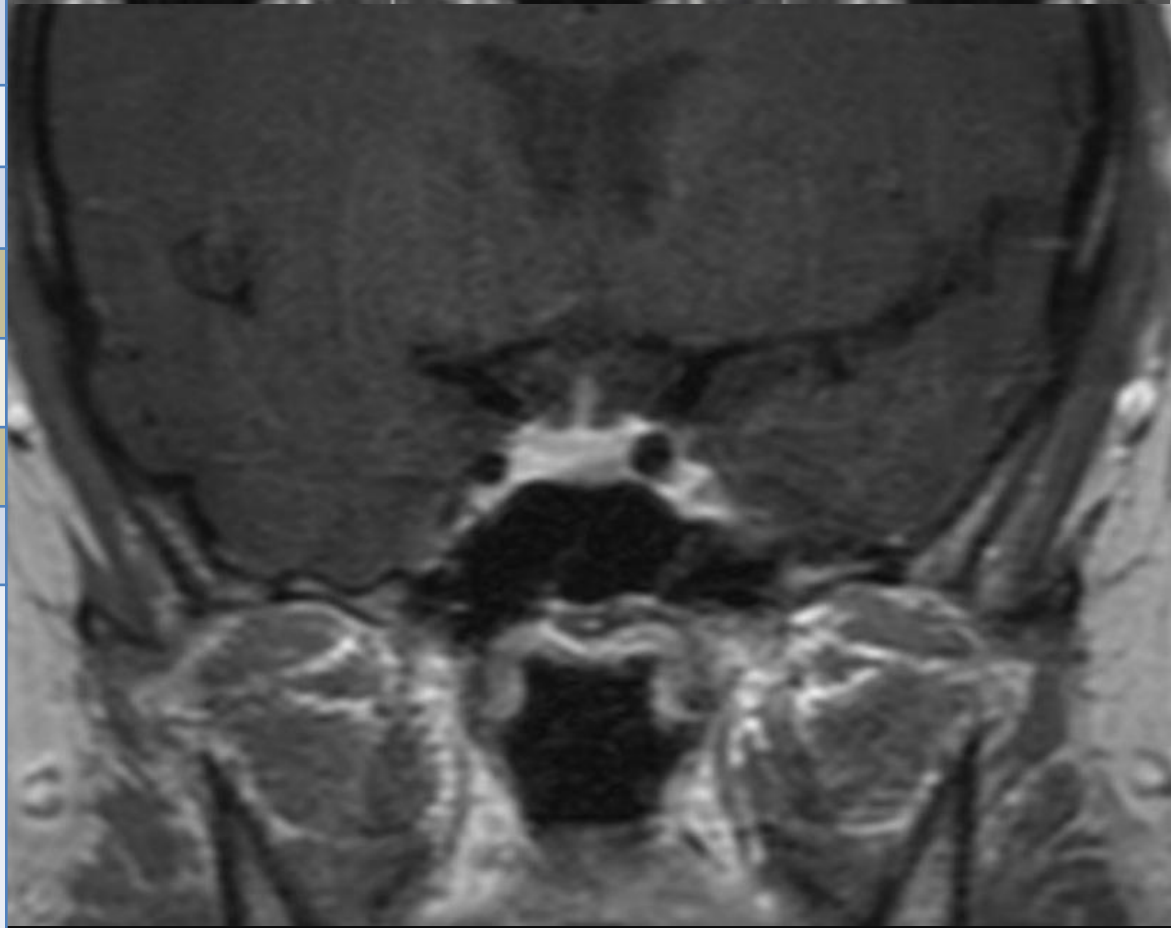
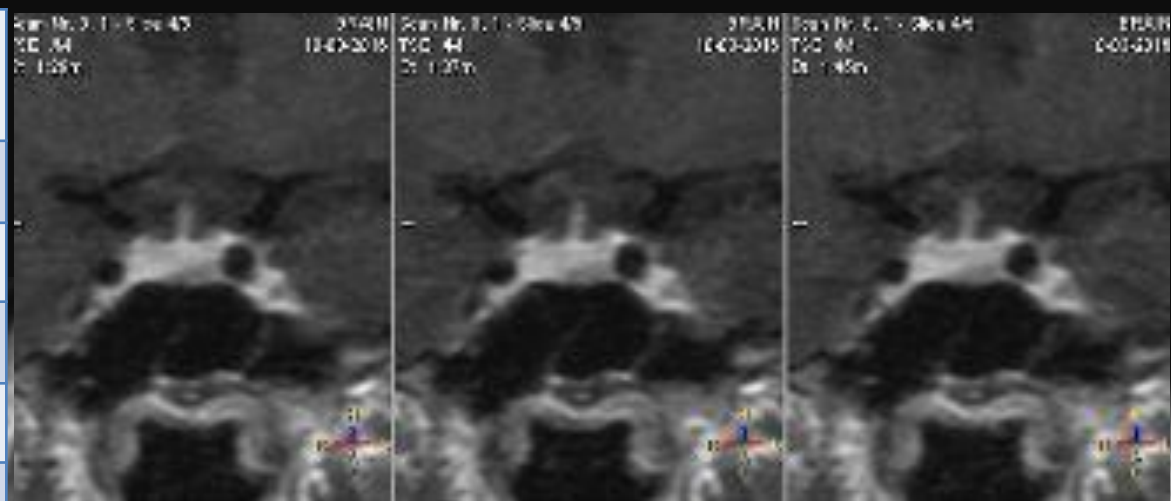
Typ	T1
Sekvence	TSE
Rovina	COR
Voxel size mm	2
FoV mm	150
Matrix	208 x 164 Voxel 0,72x0,91x2
Fáze	RL
SENSE	1,5
TR ms	550
TE ms	10
TSE factor	3
Čas	2:35
Různé	NATIV + KL NSA 2,5 Slices 13



Typ	T2
Sekvence	TSE
Rovina	COR
Voxel size mm	2
FoV mm	150
Matrix	224 x 174
Fáze	RL
SENSE	1,5
TR ms	3000
TE ms	80
TSE factor	15
Čas	1:30
Různé	Slices 11



Typ	T1 dynamika
Sekvence	TSE
Rovina	COR
Voxel size mm	3
FoV mm	180
Matrix	224 x 156 Voxel 0,8x1,15x3
Fáze	RL
SENSE	1,4
TR ms	500 (Shortest)
TE ms	12
TSE factor	7
Čas	2:33
Různé	Dyn scan 8" Dyn scan 18x



Epilepsie

cílený protokol

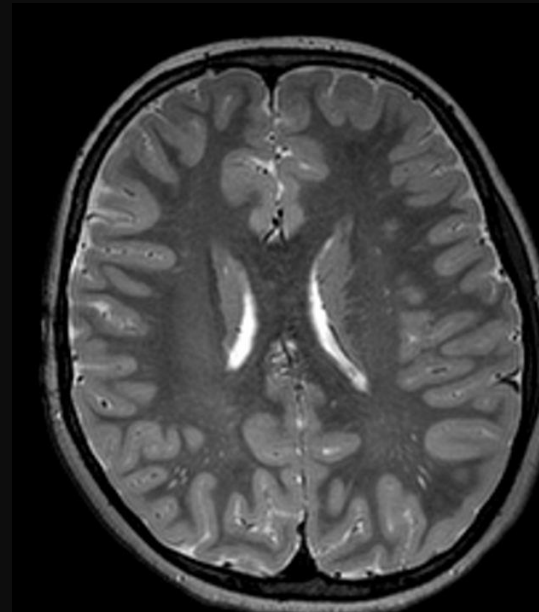
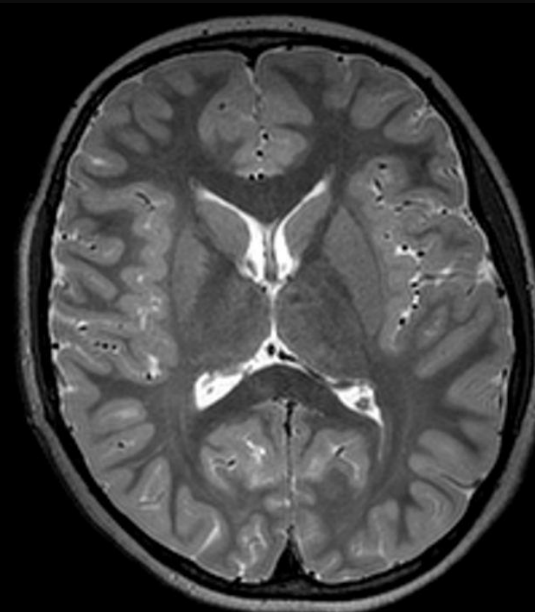
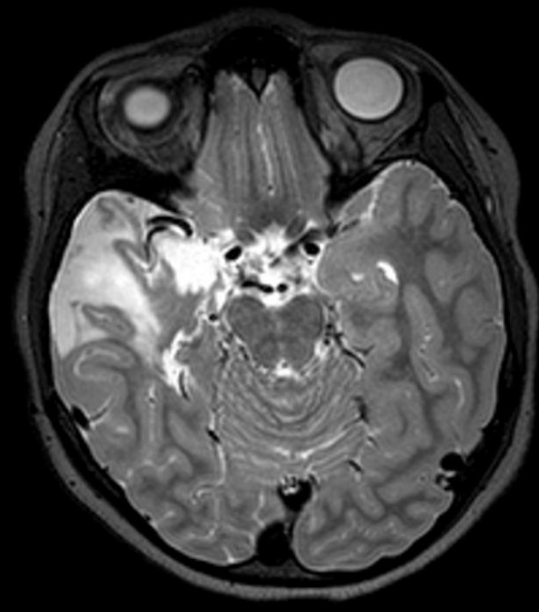
32-kanálová hlavová cívka

Kontrast	orientace	čas
T1 3D	Sag	4:26
T2	Tra	1:42
T2 FLAIR	Tra	3:18
DWI	Tra	1:06
T2 3D	Tra	9:22
T2 3D	Cor	8:17
T2 FLAIR	Cor temp	5:08
T1 IR	Cor temp	3:37

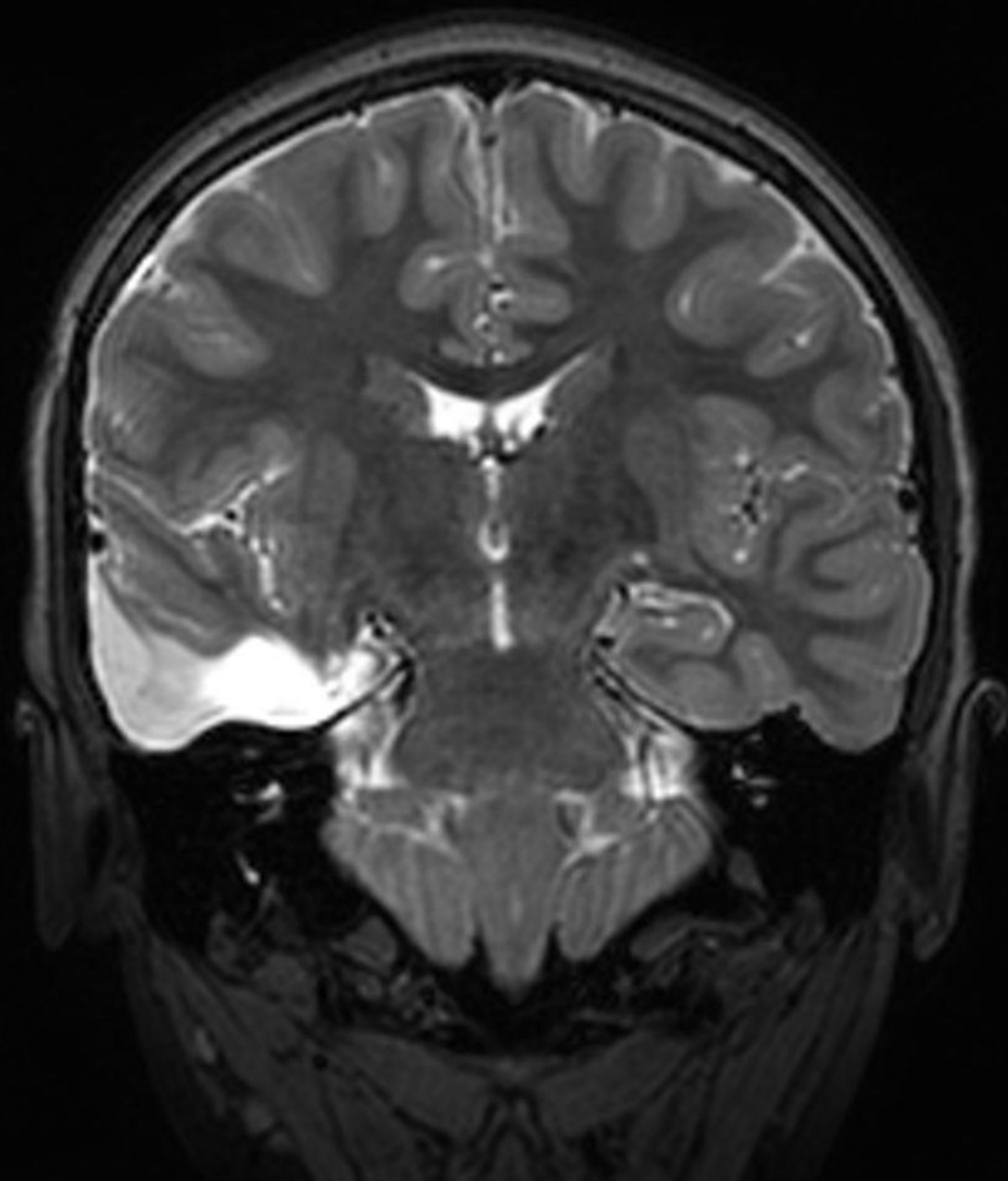
Typ	T1
Sekvence	TFE 3D
Rovina	SAG
Voxel size mm	1 x 1 x 1
FoV mm	240
Matrix	240 x 240
Fáze	AP
SENSE	AP 1, RL 2,2
TR ms	8,1 (Shortest)
TE ms	3,7 (Shortest)
TFE factor	240
Čas	4:26
Různé	Slices 160 OverSampleF 1,2



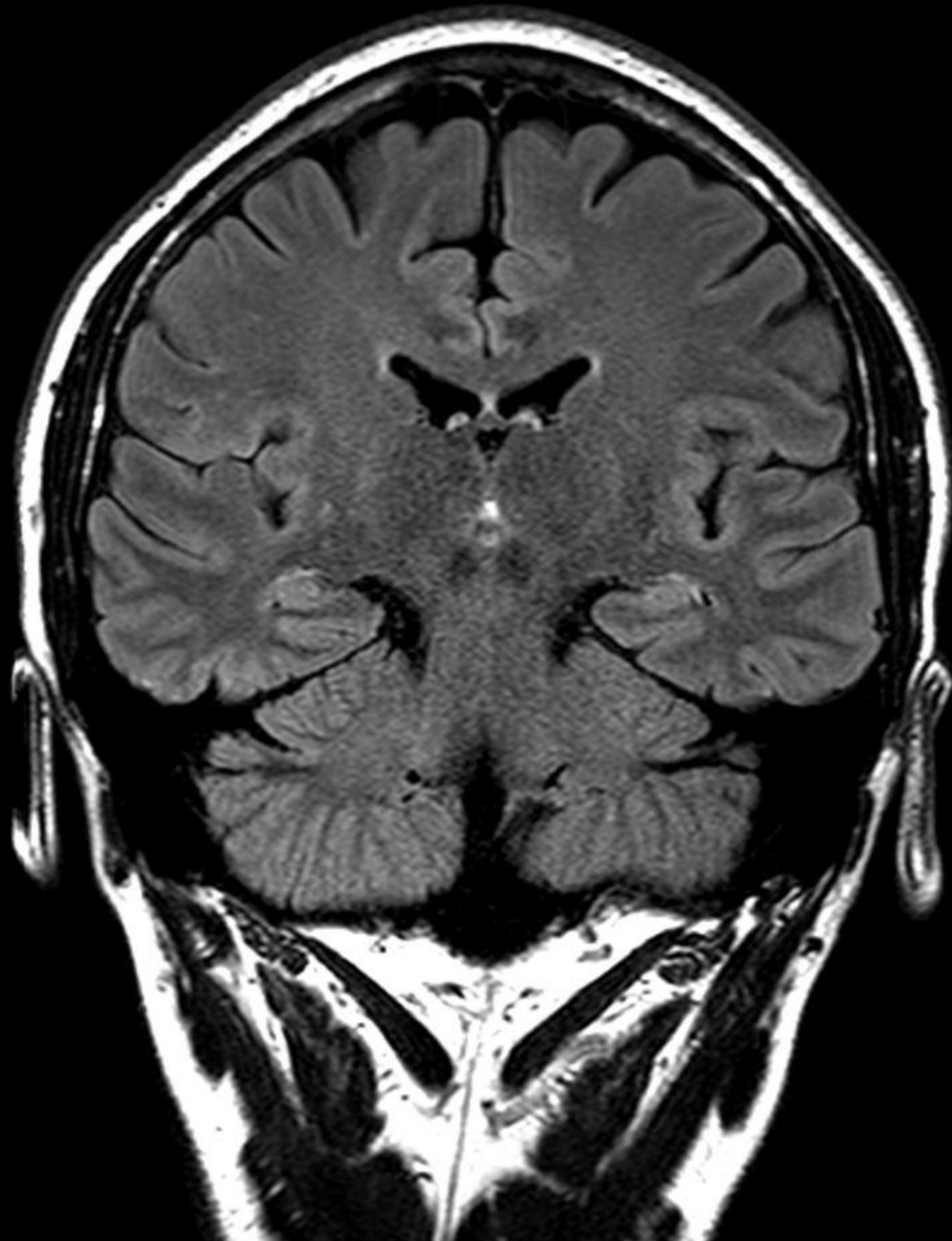
Typ	T2
Sekvence	Vista 3D
Rovina	TRA
Voxel size mm	0,86x0,86x 0,86
FoV mm	250 x 250 x 185
Matrix	292 x 290
Fáze	AP
SENSE	AP 2, FH 1,8
TR ms	2500
TE ms	280
TSE factor	120
Čas	9:22
Různé	NSA 2 Fat NO Drive NO Slices 430 OverSample F 1 Overcontig.sl. YES



Typ	T2
Sekvence	Vista 3D
Rovina	COR
Voxel size mm	1x1x1
FoV mm	200 x 200 x 250
Matrix	200 x 198
Fáze	RL
SENSE	1,8
TR ms	2500
TE ms	406
TSE factor	120
Čas	8:17
Různé	NSA 2 Fat NO Drive NO Slices 250 Overcontig.sl. NO



Typ	FLAIR
Sekvence	TSE
Rovina	COR
Vrstva mm	3
FoV mm	243 x 175
Matrix	372 x 186 Voxel 0,65x0,67x3
Fáze	RL
SENSE	off
TR ms	11000
TE ms	125
TSE factor	31
Čas	5:08
Různé	TI 2800 Slices 45

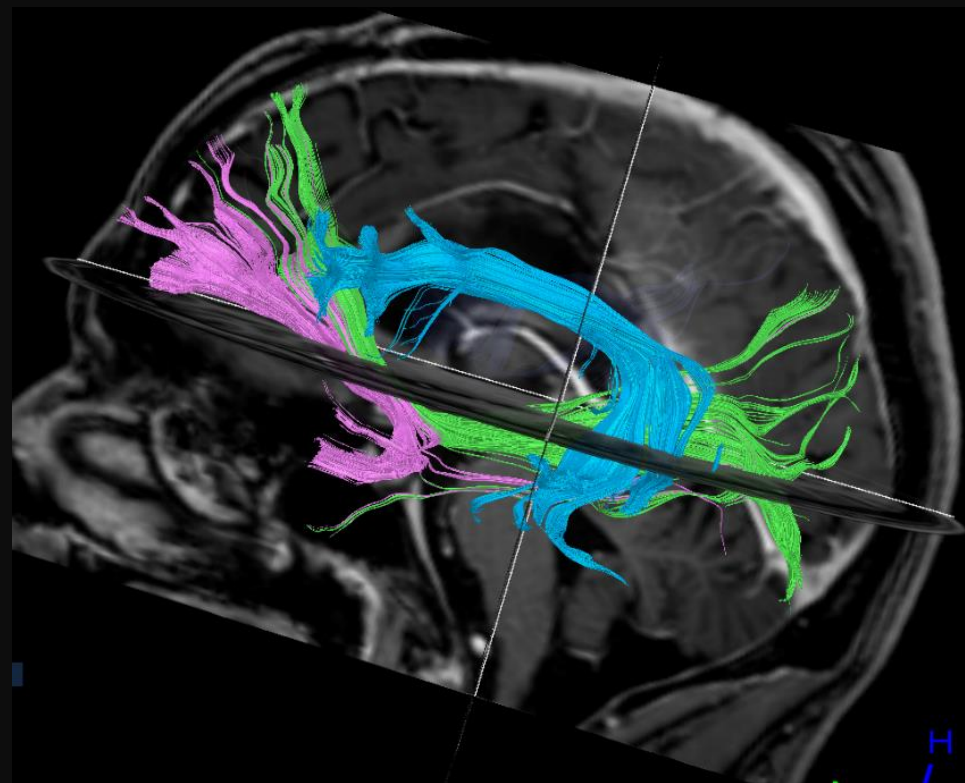


Typ	T1
Sekvence	IR
Rovina	COR
Vrstva mm	3,5
FoV mm	243 x 175
Matrix	372 x 186
Fáze	RL
SENSE	1,8
TR ms	5177 (Shortest)
TE ms	15
TSE factor	5
Čas	3:37
Různé	TI 400 Slices 38



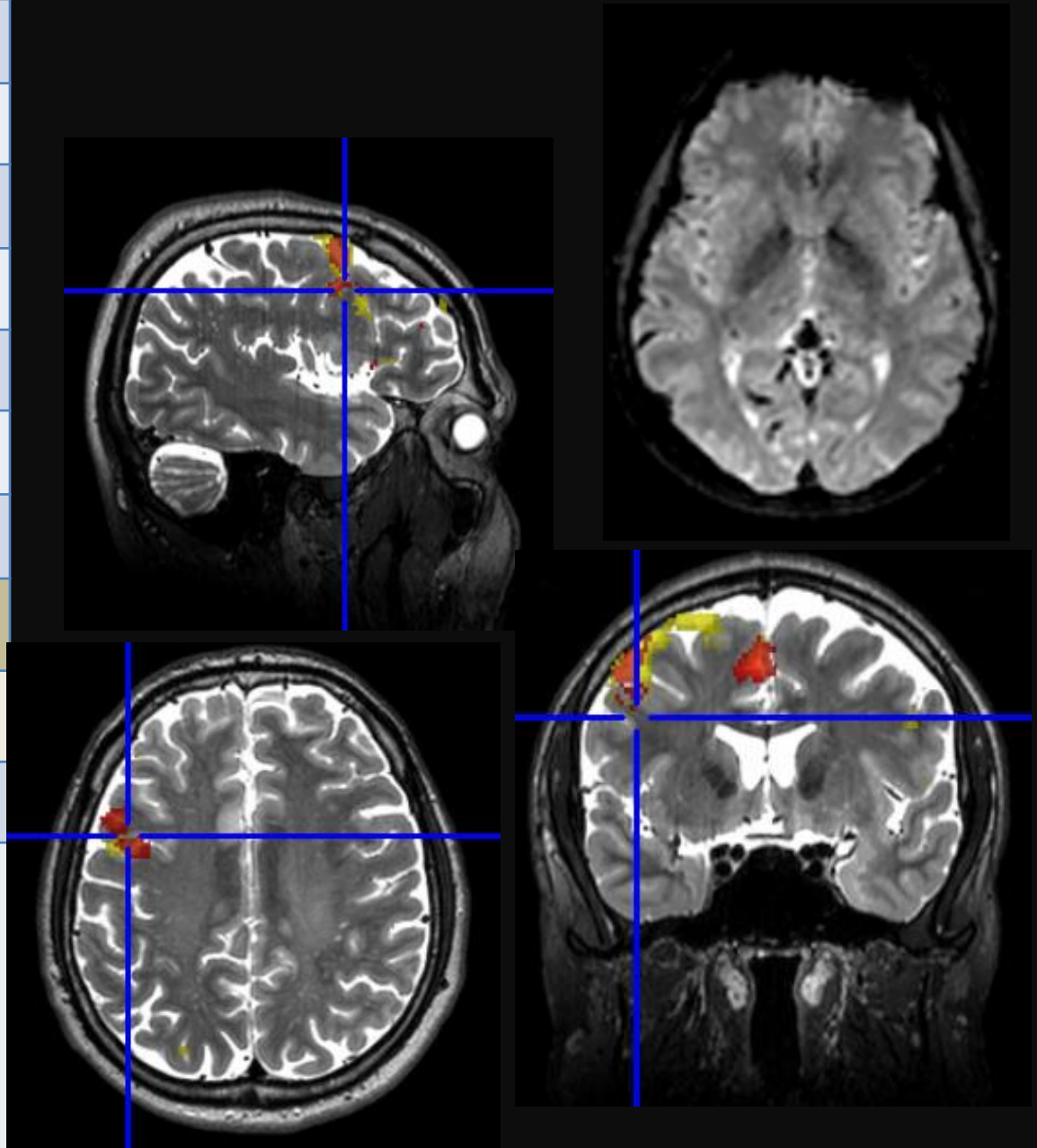
mozek – DTI, fMRI

Typ	DTI Medium
Sekvence	EPI
Rovina	TRA
Vrstva mm	2
FoV mm	210 x 210
Matrix	104 x 106
Fáze	AP
SENSE	2
TR ms	7979
TE ms	55
Čas	4:55
Různé	NSA 2 Slices 70 Gap 0 Spir 2b factors 0 - 700 Directional resolution: medium (16)



Typ	fMRI DWI
Sekvence	EPI
Rovina	TRA
Vrstva mm	2
FoV mm	208 x 208
Matrix	104 x 102
Fáze	AP
SENSE	1,8
TR ms	3000
TE ms	30
Čas	5:12
Různé	NSA 2 Slices 39 Gap 0 Spir

Verbální: **generování slov (VF)**, **generování sloves**



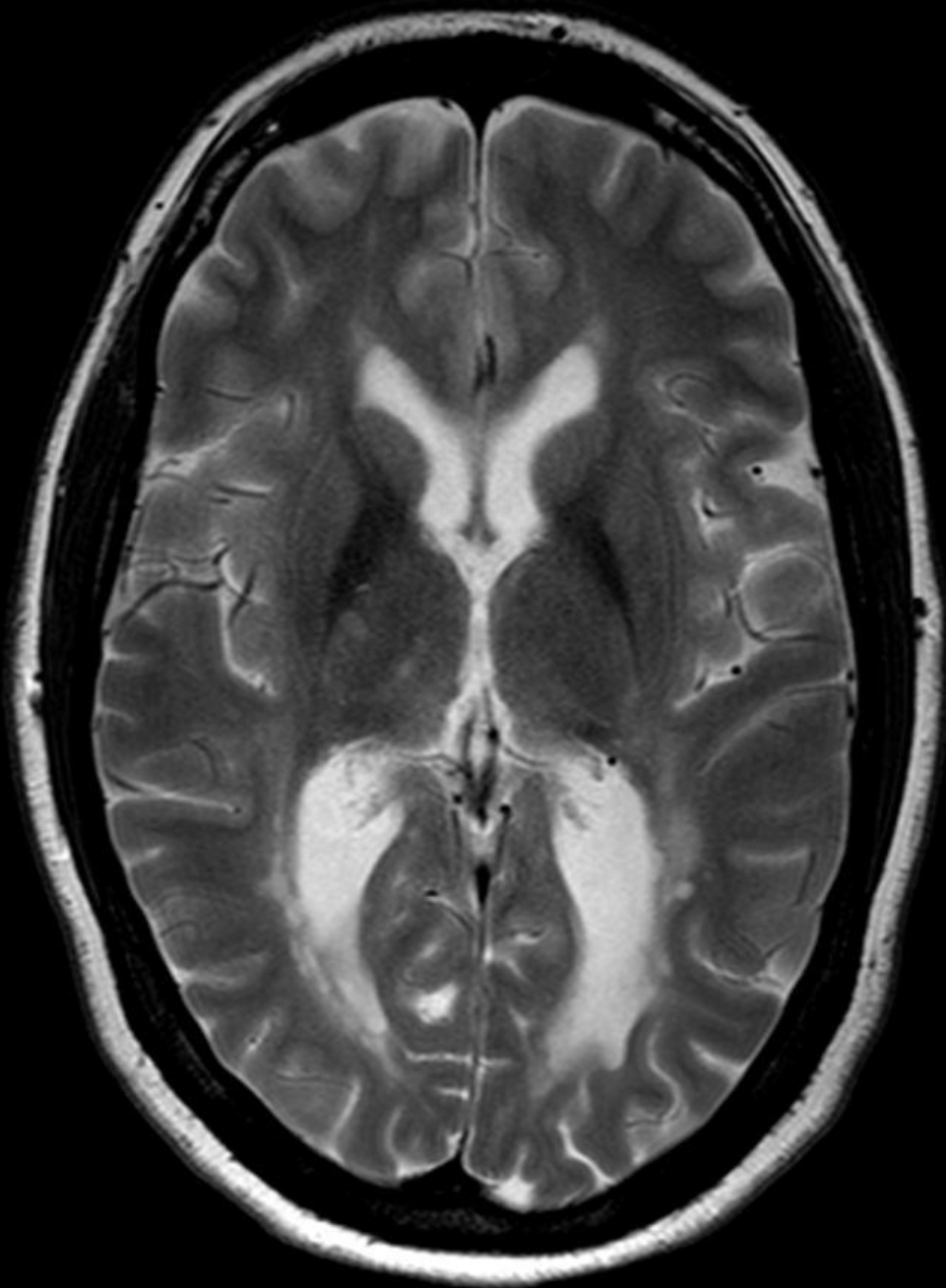
mozek – RS

Kontrast	orientace	čas
T2	Sag	1:46
T2	Tra	1:42
FLAIR 3D	Tra	7:00
T1 3D	Tra	5:38

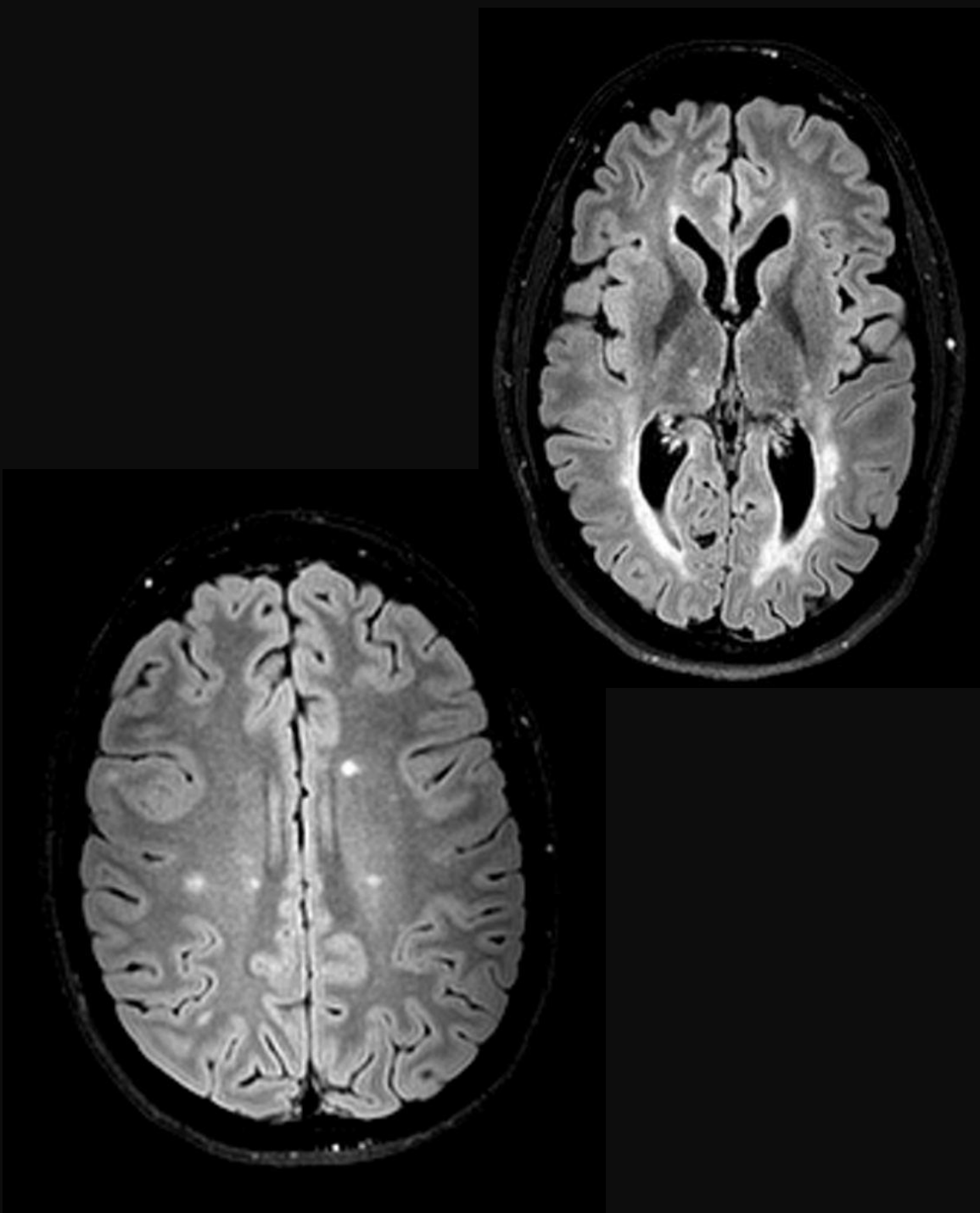
Typ	T2
Sekvence	TSE
Rovina	SAG
Vrstva mm	3
FoV mm	300 x 224
Matrix	428 x 312
Fáze	AP
SENSE	off
TR ms	2500 – 4000
TE ms	100
TSE factor	25
Čas	1:46
Různé	DRIVE YES



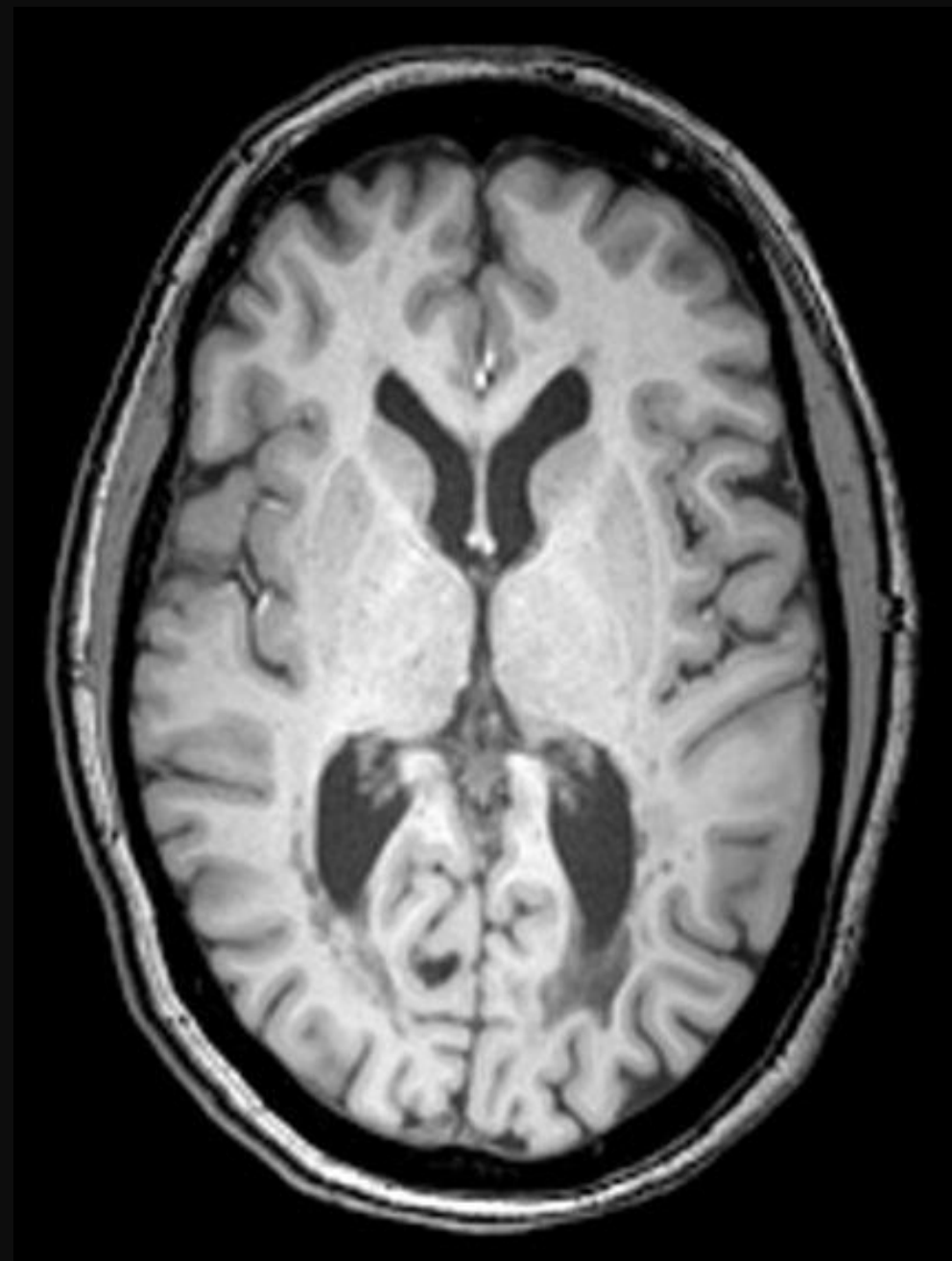
Typ	T2
Sekvence	TSE
Rovina	TRA
Vrstva mm	4
FoV mm	230 x 190
Matrix	412 x 263 Voxel 0,57*0,73*4
Fáze	RL
SENSE	1,1
TR ms	3000-4000
TE ms	80
TSE factor	15
Čas	1:42
Různé	NSA 1 Slices 28



Typ	FLAIR
Sekvence	TSE 3D
Rovina	TRA
Vrstva mm	1
FoV mm	230 x 200
Matrix	232 x 197
Fáze	RL
SENSE	RL 2,8 FH 1,5
TR ms	5300
TE ms	289
TSE factor	182
Čas	7
Různé	NSA 2 TI 1850 Slices 160



Typ	T1
Sekvence	TFE 3D
Rovina	TRA
Voxel size mm	1
FoV mm	180 x 250
Matrix	180 x 248
Fáze	AP
SENSE	AP 1 FH 2
TR ms	10 (Shortest)
TE ms	8
TFE factor	248
Čas	5:38
Různé	NSA 1 Slices 160



C páteř

16-kanálová neurovaskulární cívka

Kontrast	orientace	čas
T2	Sag	2:18
T1	Sag	2:07
STIR	Sag	1:45
T2 FFE	Tra	2:04
T2 DRIVE	Tra	4:07
Option		
T2	Tra	3:09
T2 mFFE	Tra	2:50

Typ	T2
Sekvence	TSE
Rovina	SAG
Vrstva mm	3
FoV mm	160 x 250
Matrix	268 x 306 Voxel 0,6x0,8x3
Fáze	FH
SENSE	1,6
TR ms	3000-5000
TE ms	100
TSE factor	21
Čas	2:18
Různé	Adaptive NO Slices 13 Rest YES Drive NO



Typ	T1
Sekvence	TSE
Rovina	SAG
Vrstva mm	3
FoV mm	160 x 250
Matrix	188 x 256 Voxel 0,85x0,97x3
Fáze	FH
SENSE	1,5
TR ms	450-700
TE ms	8
TSE factor	3
Čas	2:07
Různé	



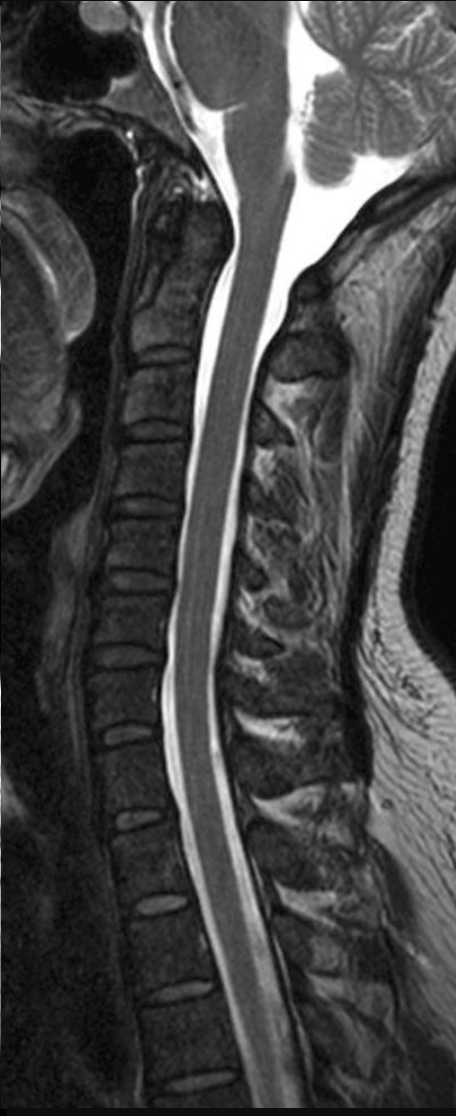
Typ	STIR
Sekvence	TSE
Rovina	SAG
Vrstva mm	3
FoV mm	160 x 250
Matrix	200 x 229
Fáze	FH
SENSE	1,7
TR ms	3500-5000
TE ms	70
TSE factor	23
Čas	1:45
Různé	Asymmetric TI 210



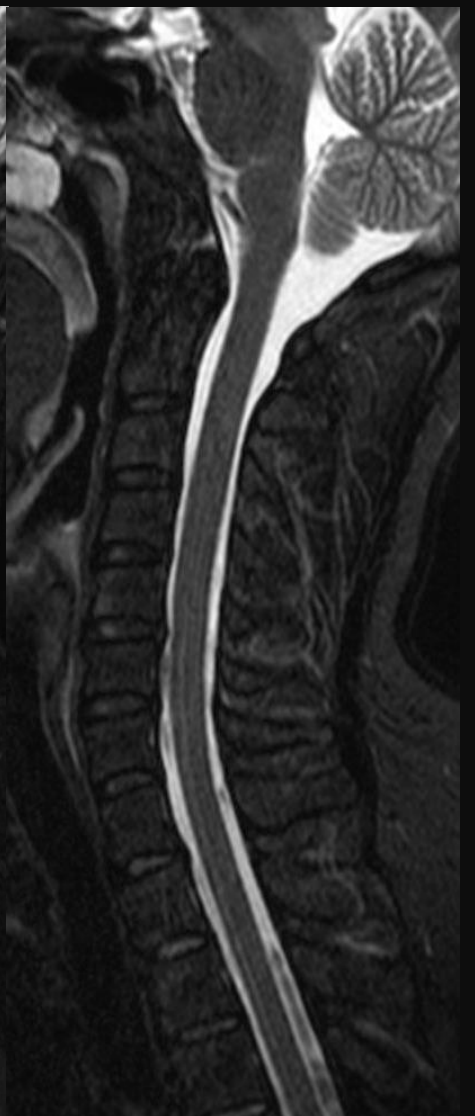
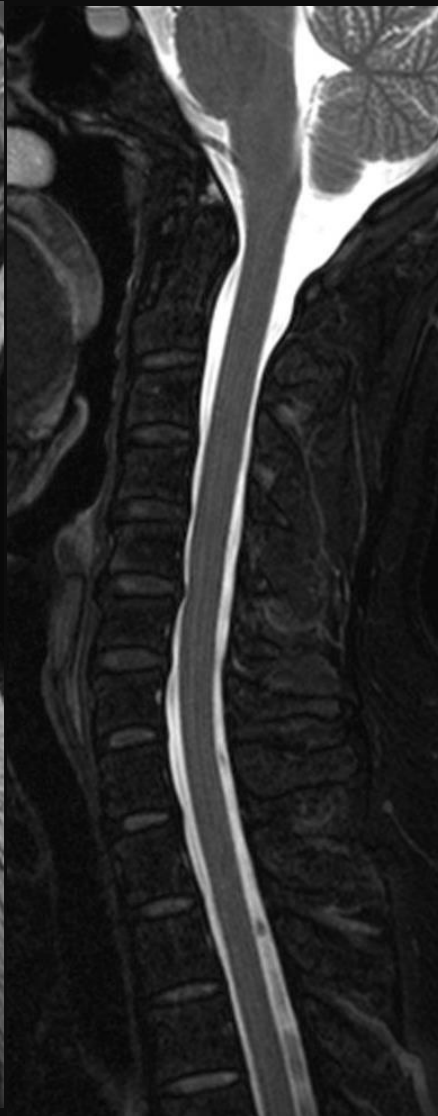
T2



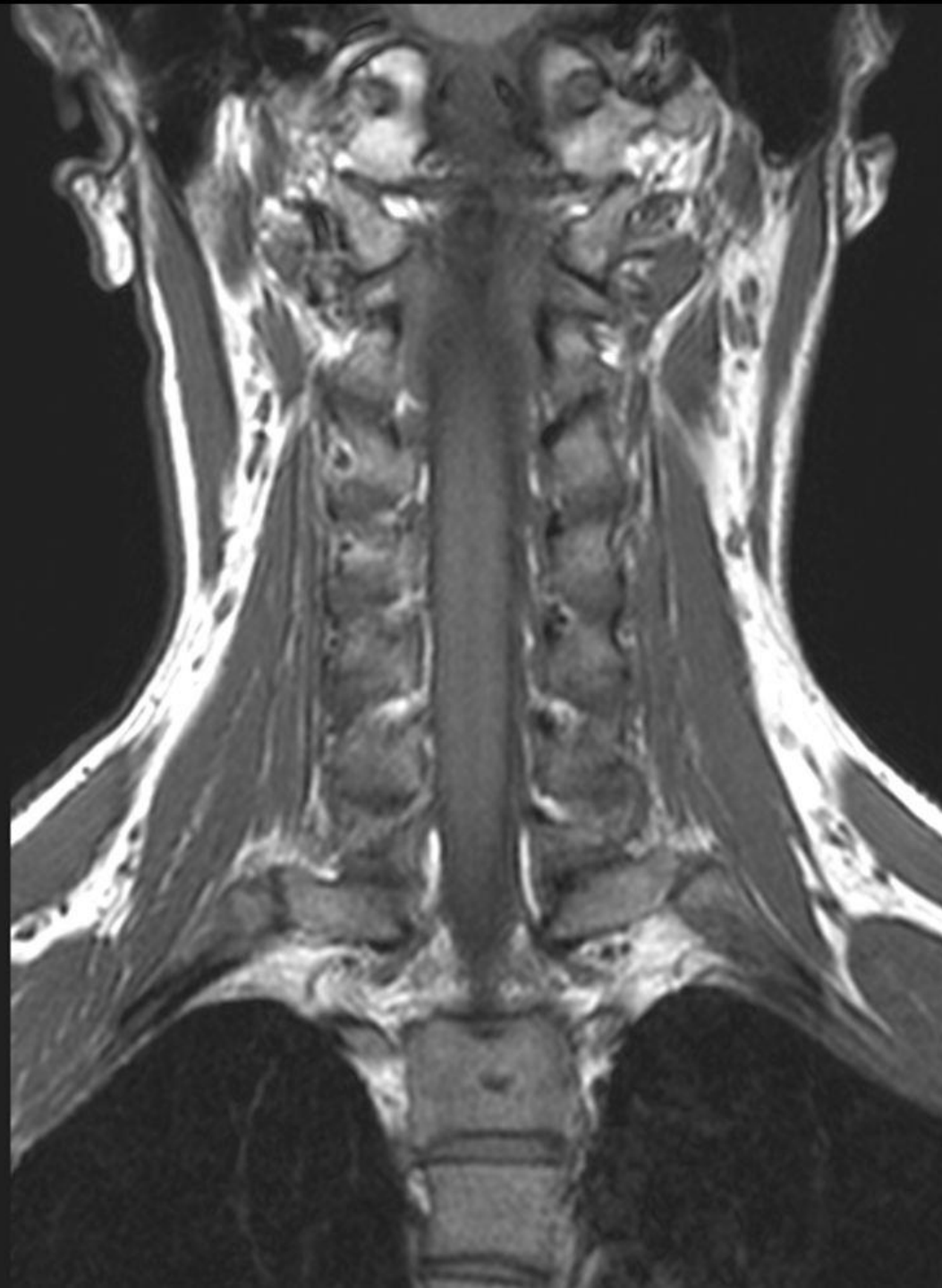
mDIXON



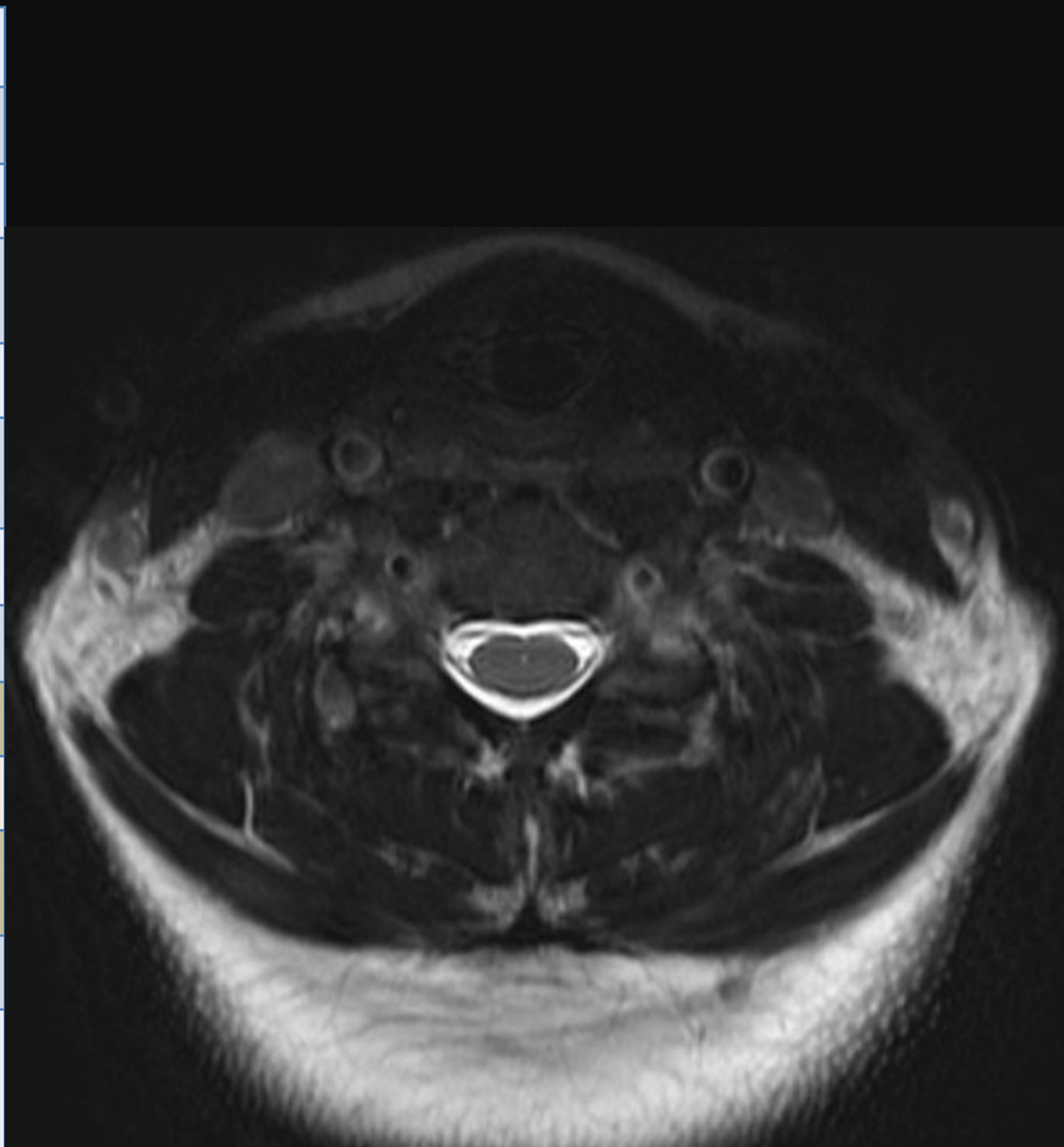
STIR



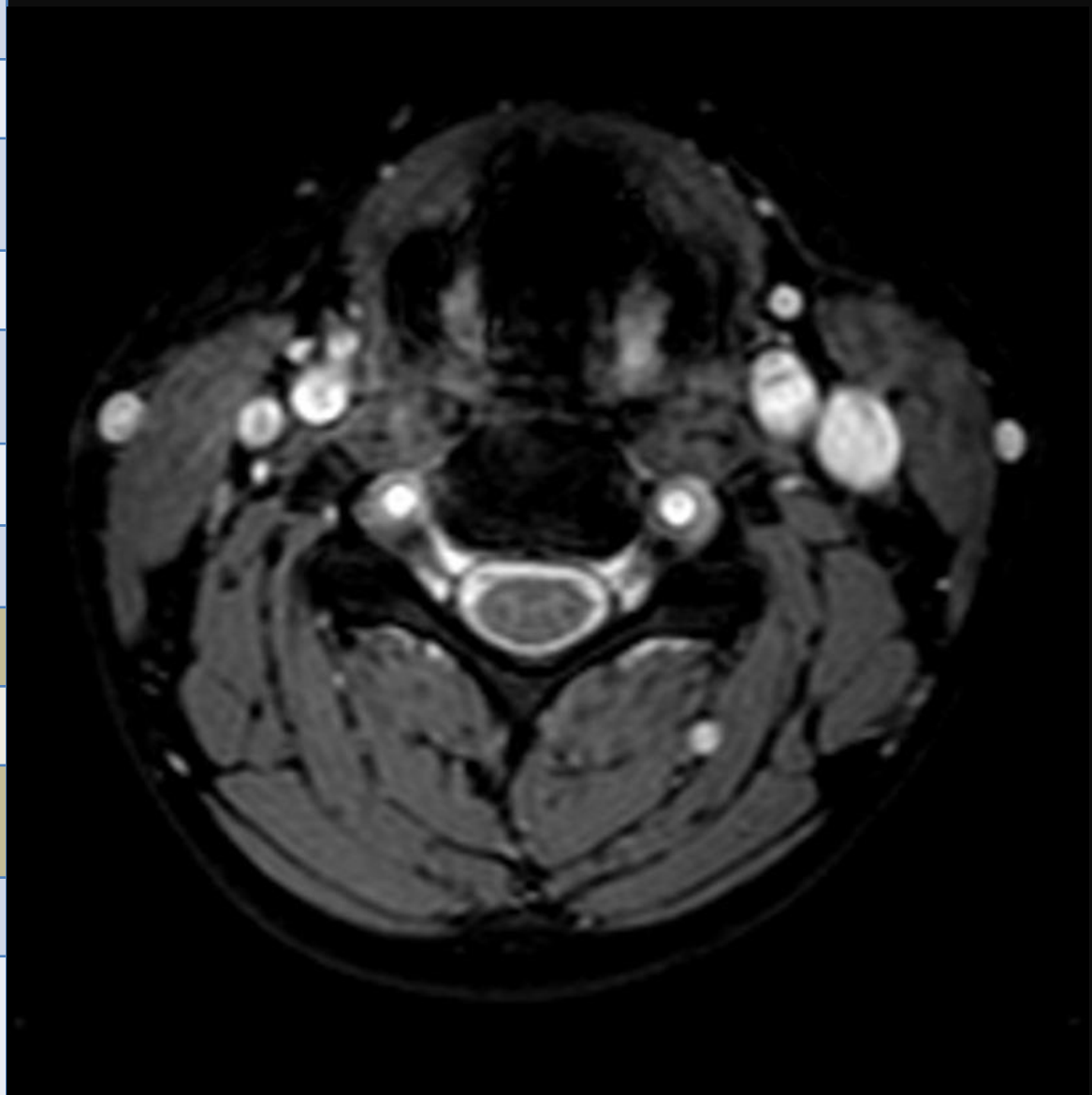
Typ	T1
Sekvence	TSE
Rovina	COR
Vrstva mm	3
FoV mm	160 x 250
Matrix	188 x 256
Fáze	FH
SENSE	1,8
TR ms	400-500
TE ms	8
TSE factor	3
Čas	1:38
Různé	Slices 14



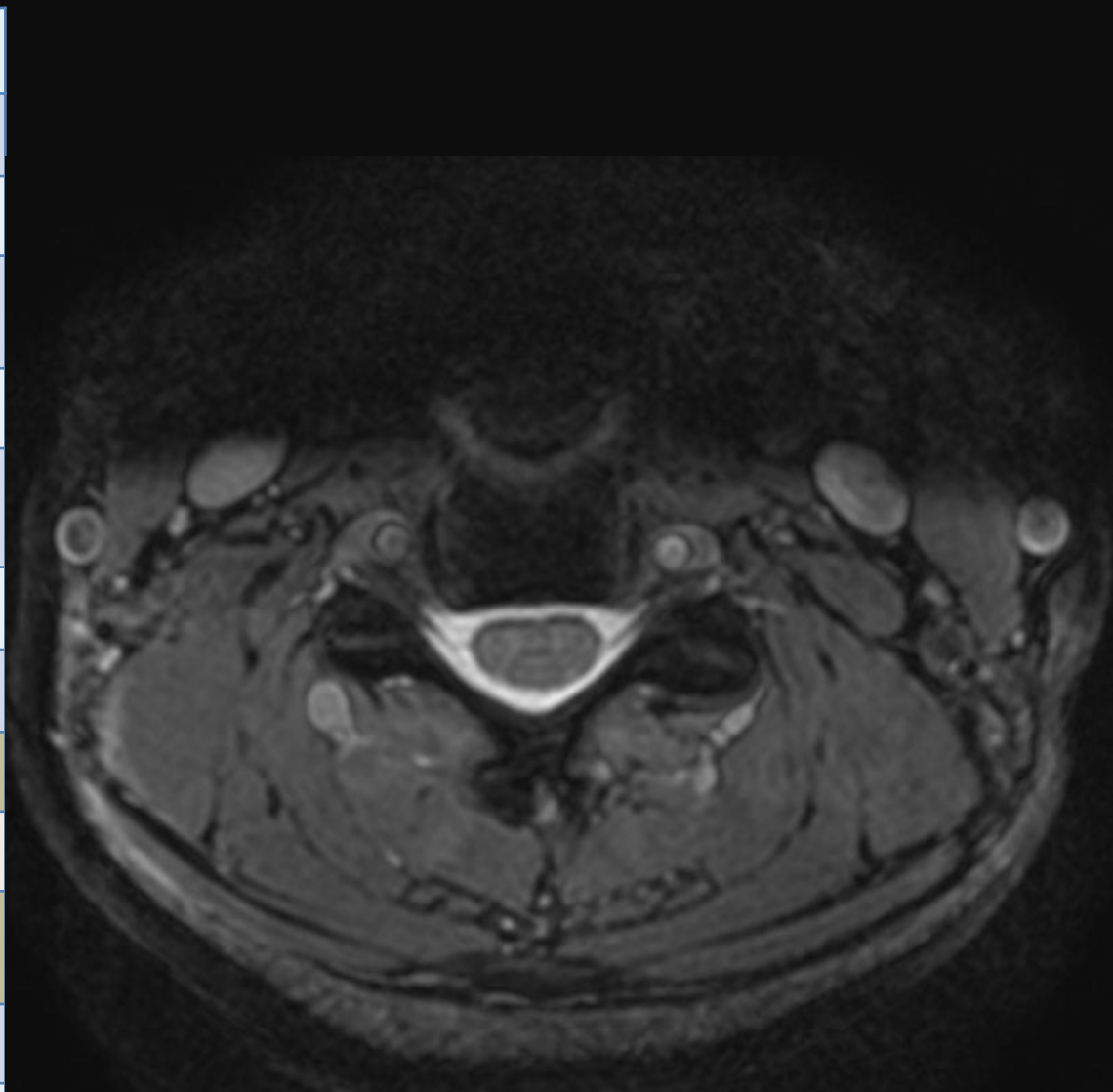
Typ	T2 DRIVE
Sekvence	TSE 3D
Rovina	TRA
Vrstva mm	3
FoV mm	200 x 152
Matrix	400 x 214 Voxel 0,5x0,7x3
Fáze	AP
SENSE	AP 1 FH 1,3
TR ms	1500
TE ms	100
TSE factor	39
Čas	4:07
Různé	NSA 1 Slices 66 Rest YES



Typ	T2 FFE
Sekvence	FFE
Rovina	TRA
Vrstva mm	3
FoV mm	150 x 150
Matrix	200 x 150 Voxel 0,75x1x3
Fáze	RL
SENSE	FH 1,5 RL 1
TR ms	31 (Shortest)
TE ms	6,6 (Shortest)
TSE factor	
Čas	2:04
Různé	NSA 1 Slices 66



Typ	T2 mFFE 4echa
Sekvence	FFE
Rovina	TRA
Vrstva mm	3
FoV mm	150 x 150
Matrix	188 x 186 Voxel 0,8x0,8x3
Fáze	RL
SENSE	2
TR ms	700-800
TE ms	6,7-8,2 (Shortest)
TSE factor	
Čas	2:50
Různé	NSA 1 Slices 30 Rest YES



LS páteř

16-kanálová páteřní cívka

Kontrast	orientace	čas
T2	Sag	3:17
T1	Sag	2:41
T2 SPAIR	Sag	2:48
T2	Tra	2:09 -4 min
T1	Cor	1:59
Option		
STIR	Sag	3:45
T1	Tra	

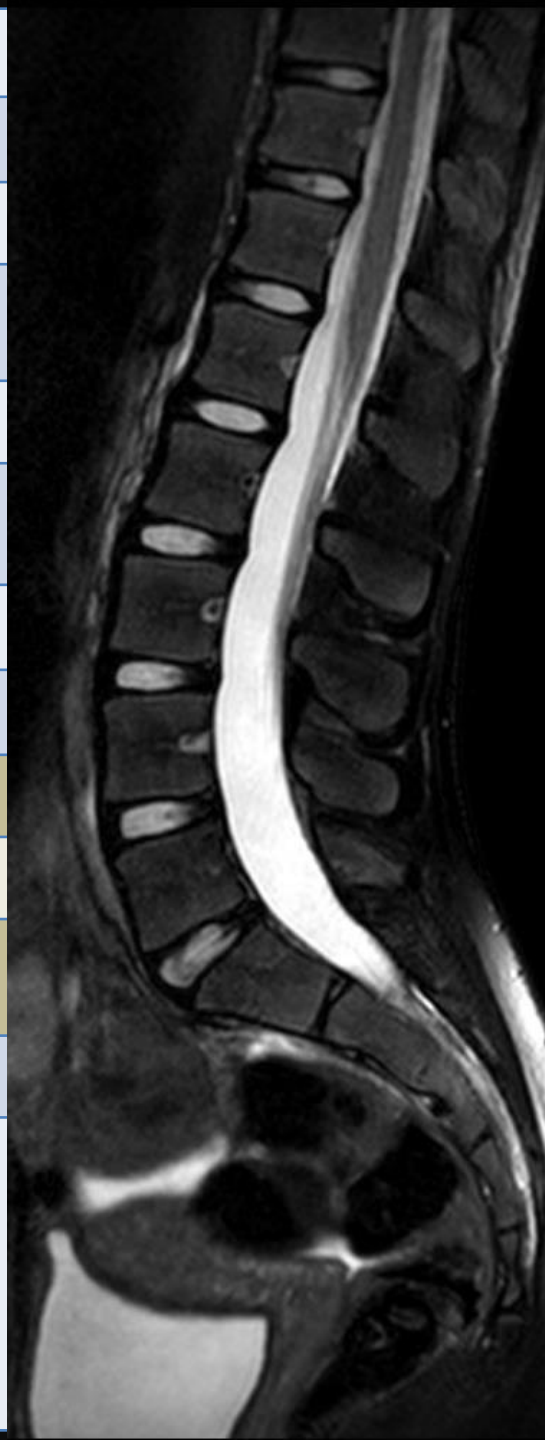
Typ	T2
Sekvence	TSE
Rovina	SAG
Vrstva mm	3,5
FoV mm	200 x 350
Matrix	248 x 345 Voxel 0,8x1x3,5
Fáze	FH
SENSE	1,4
TR ms	3500-5000
TE ms	110
TSE factor	23
Čas	3:17
Různé	NSA 1 Asymmetric profile order Adaptive YES Drive YES Slices 17



Typ	T1
Sekvence	TSE
Rovina	SAG
Vrstva mm	3,5
FoV mm	200 x 350
Matrix	236 x 326 Voxel 0,84x1x3,5
Fáze	FH
SENSE	1,4
TR ms	450-700
TE ms	8
TSE factor	5
Čas	2:41
Různé	NSA 1



Typ	T2 SPAIR
Sekvence	TSE
Rovina	SAG
Vrstva mm	3,5
FoV mm	200 x 350
Matrix	228 x 375 Voxel 0,87x0,92x3,5
Fáze	FH
SENSE	1,4
TR ms	4000-8000
TE ms	100
TSE factor	25
Čas	2:48
Různé	NSA 1 Drive NO Slices 17



Typ	T2 mDIXON
Sekvence	TSE
Rovina	SAG
Vrstva mm	3,5
FoV mm	200 x 350
Matrix	
Fáze	FH
SENSE	
TR ms	
TE ms	
TSE factor	
Čas	
Různé	



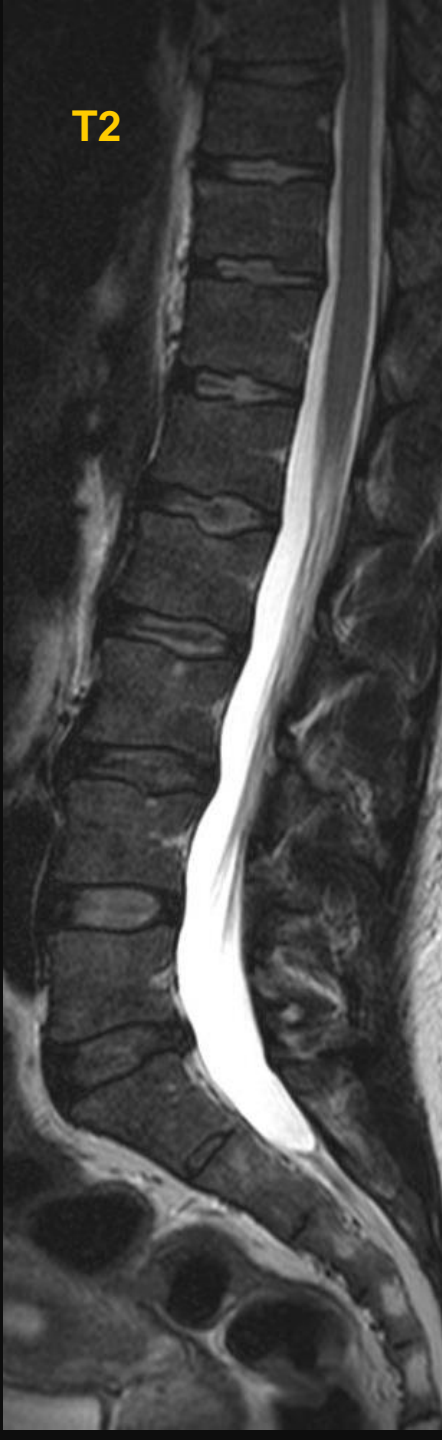
mDIXON

T2 SPAIR

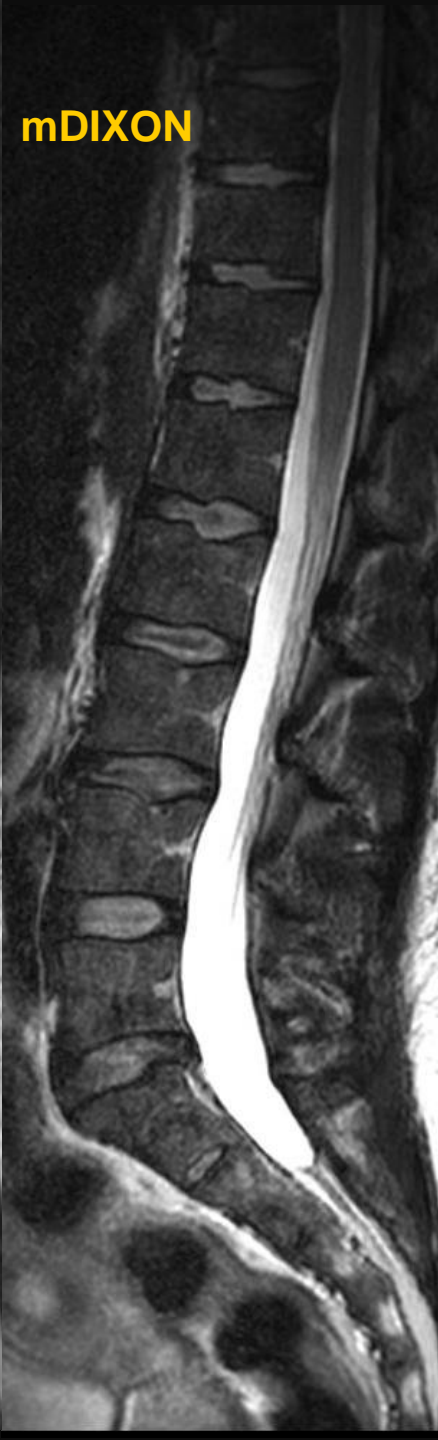
STIR



T2



mDIXON



T2



mDIXON



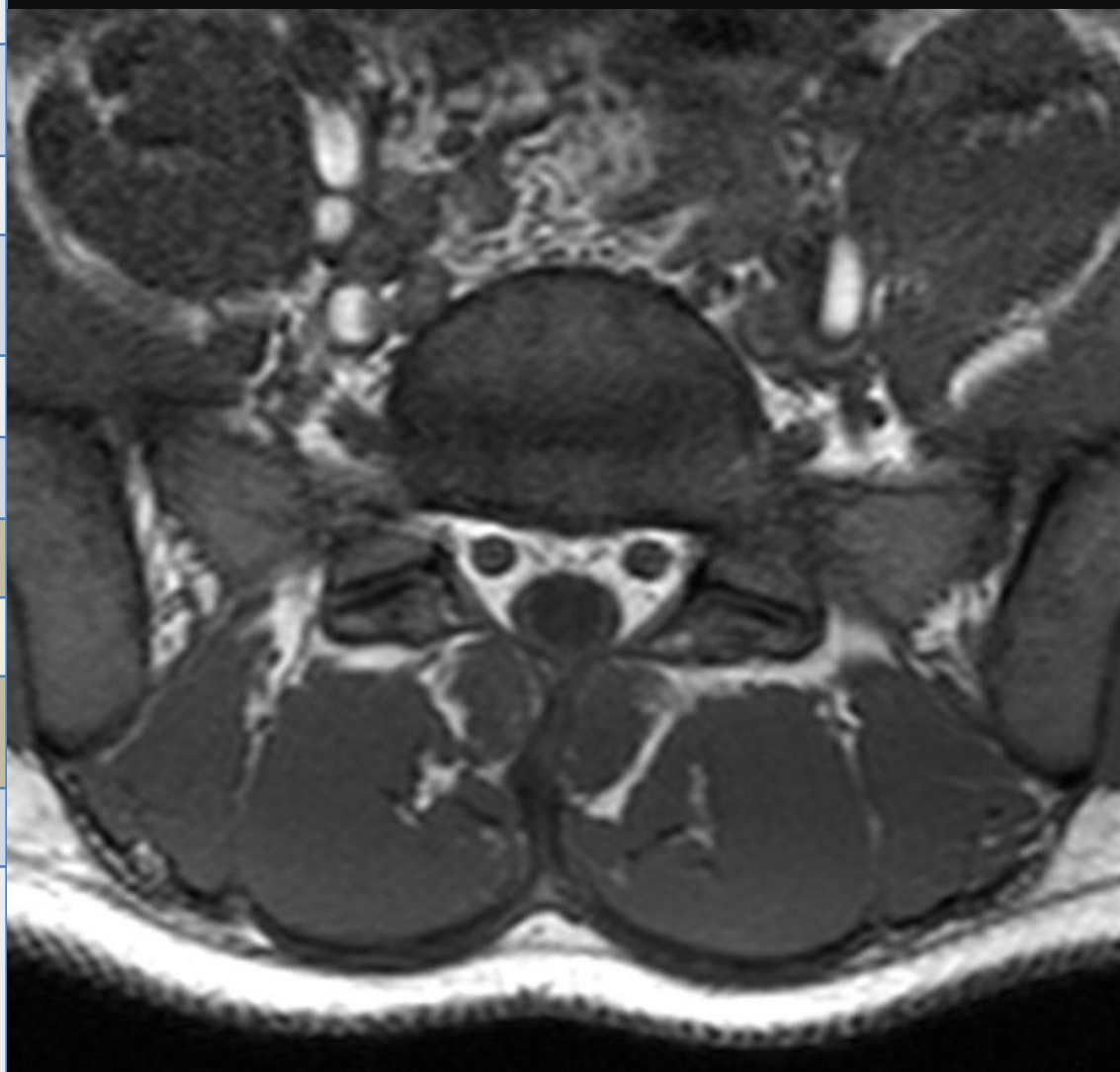
Typ	STIR long TE
Sekvence	TSE
Rovina	SAG
Vrstva mm	3,5
FoV mm	200 x 350
Matrix	200 x 241
Fáze	FH
SENSE	off
TR ms	3500-5000
TE ms	60
TSE factor	23
Čas	3:45
Různé	NSA 1 Slices 17



Typ	T2
Sekvence	TSE
Rovina	TRA
Vrstva mm	3,5
FoV mm	180
Matrix	300 x 217 Voxel 0,6x0,8x3,5
Fáze	RL
SENSE	1,4
TR ms	3000-5000
TE ms	120
TSE factor	24
Čas	2:09
Různé	NSA 1 Adaptive YES Drive YES Slices 20



Typ	T1
Sekvence	TSE
Rovina	TRA
Vrstva mm	3,5
FoV mm	180
Matrix	
Fáze	RL
SENSE	
TR ms	
TE ms	
TSE factor	
Čas	
Různé	



Typ	T1
Sekvence	TSE
Rovina	COR
Vrstva mm	3
FoV mm	200 x 320
Matrix	236 x 297
Fáze	FH
SENSE	1,4
TR ms	450-700
TE ms	8
TSE factor	5
Čas	1:59
Různé	NSA1 Slices 18

