

Tutorial

RM GE



Gemelli



ANGIO-RM TSA

giu. '22

Fondazione Policlinico Universitario Agostino Gemelli IRCCS
Università Cattolica del Sacro Cuore





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Radiographer

Gemelli

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giu. '22

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Ver 1.3

giu. '22

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Optima MR450w 1.5T GEM Suite



SIGNA™ Voyager - 70 cm



SIGNA™ Premier - 70 cm

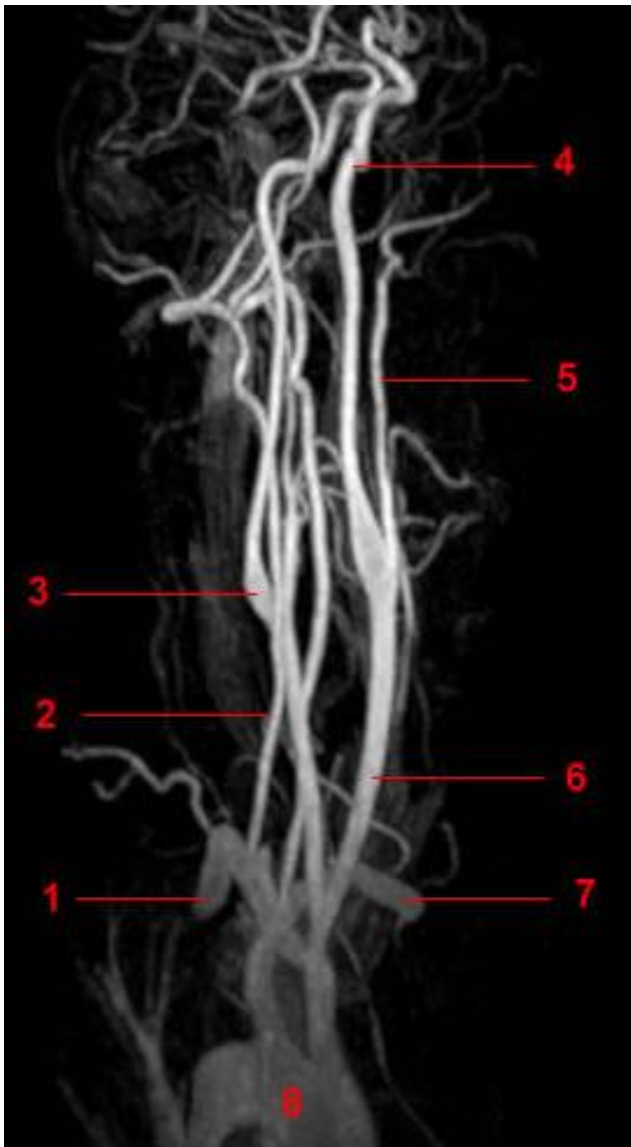


Angio-RM TSA

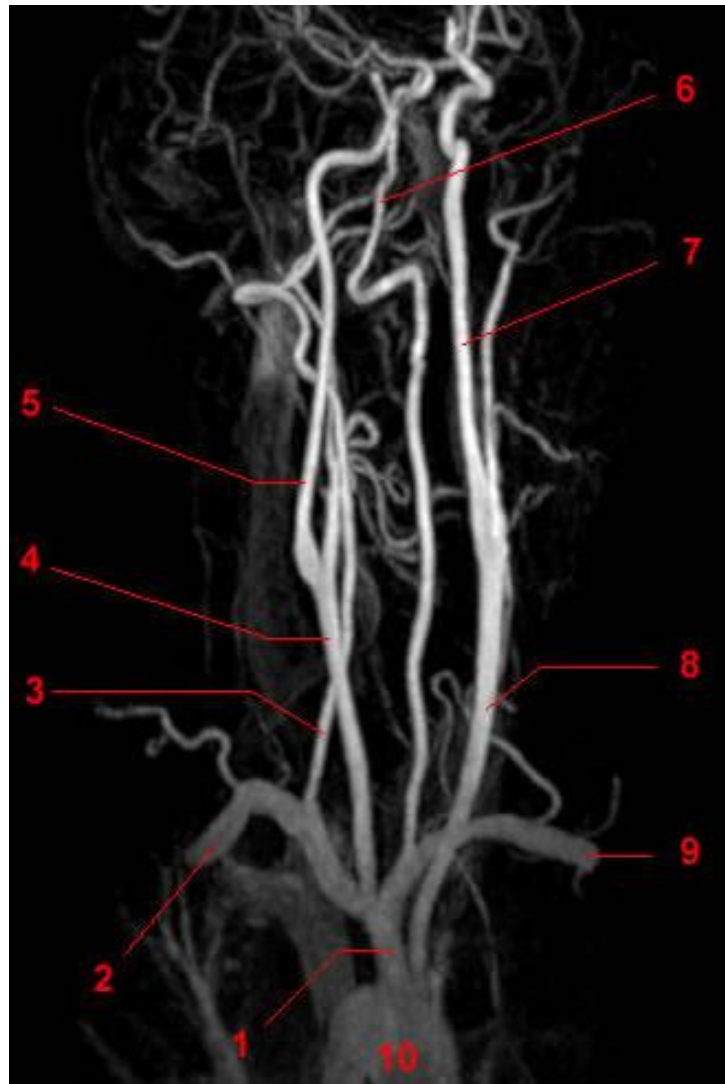
Angio-RM TSA: Risonanza Magnetica angiografica dei tronchi sovraortici

- 1, arteria succlavia destra.
- 2, arteria vertebrale destra.
- 3, arteria carotide interna destra.
- 4, arteria carotide interna sinistra.
- 5, arteria carotide esterna sinistra.
- 6, arteria carotide comune sinistra.
- 7, arteria succlavia sinistra.
- 8, Aorta.

<https://www.info-radiologie.ch/it/angio-rm-intracranico.php>



Angio-RM TSA



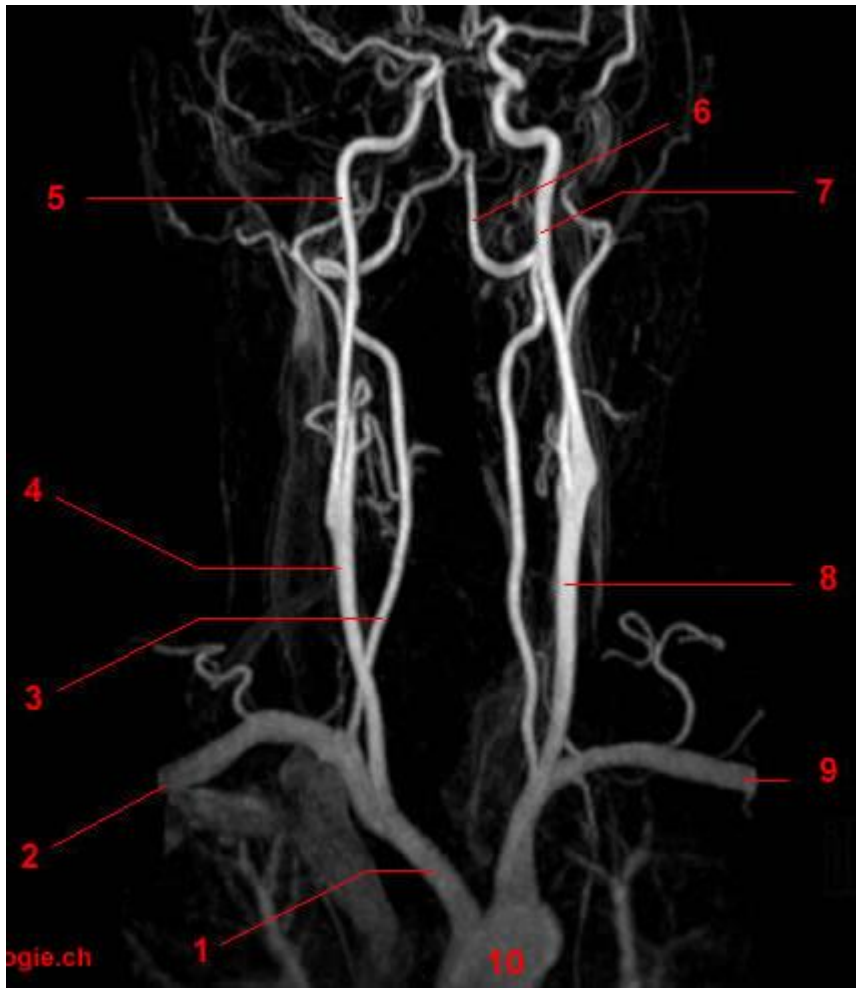
- 1, brachiocefalico tronco (o arteria innominata).
- 2, arteria succlavia destra.
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- 9, arteria succlavia sinistra.
- 10, Aorta.

Angio-RM TSA



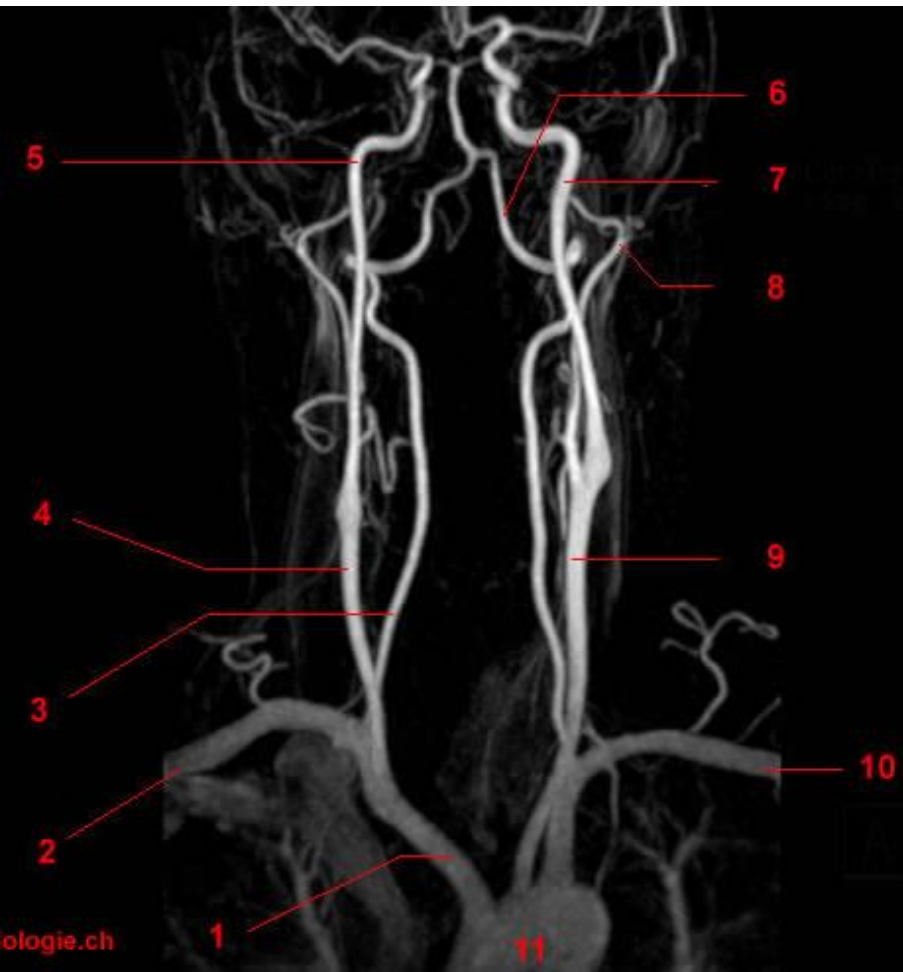
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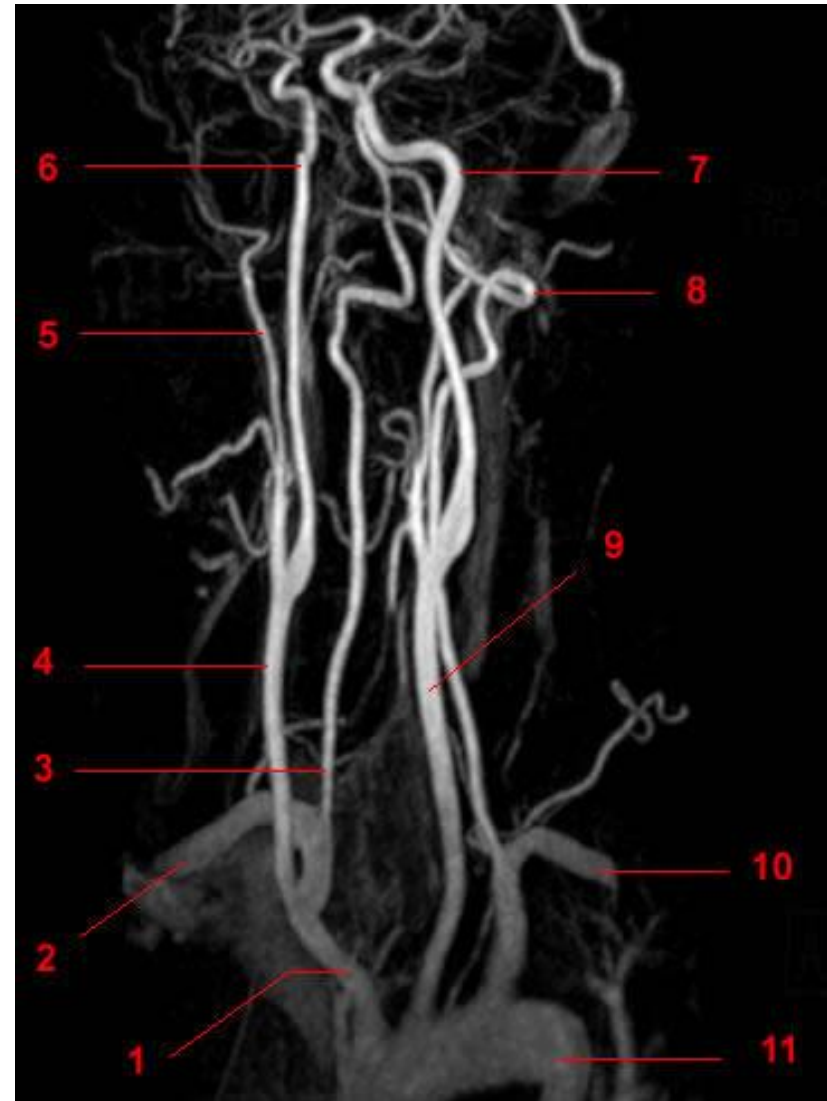
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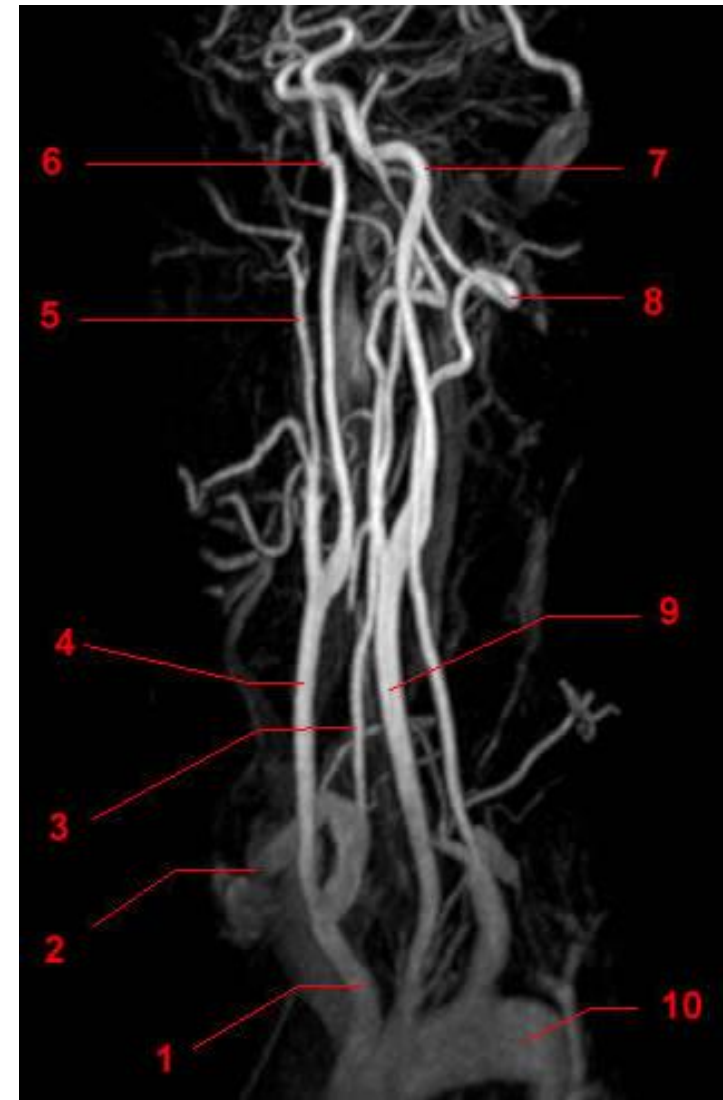
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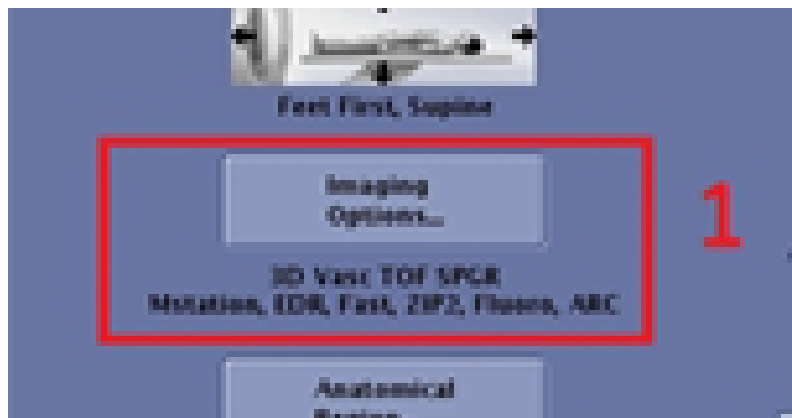
Angio-RM TSA

Per eseguire nel modo migliore la sequenza Angio-RM TSA, deve essere abilitata la funzione «FLUORO Trigger».

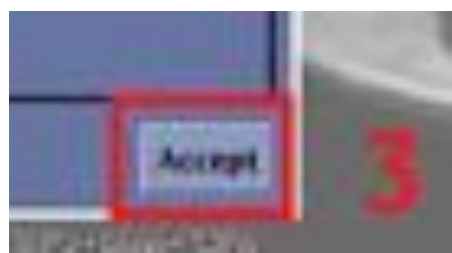
The screenshot displays the '4914 Abdomen Vascular Run-off P...' sequence configuration. The task list on the left shows the selected task '4 InRx 3D Cor CEMRA STN 1' at 00:10. The central image area shows a sagittal view of the abdomen with a 'Fluoro Trigger' checkbox checked in the 'Imaging Option' panel. The '3D Vasc. TOF-SPGR' configuration panel at the bottom left has 'Imaging Options...' highlighted with a red box and a '1' label. The 'Accept' button at the bottom right of the 'Imaging Option' panel is also highlighted with a red box and a '3' label. The 'SAR Display' at the bottom right shows 'Avg W/kg: 10 Sec' and 'Limit W/kg: 8.0'.

Angio-RM TSA

1. Fare clic su «Imaging Options» 2. Selezionare **Fluoro Trigger**

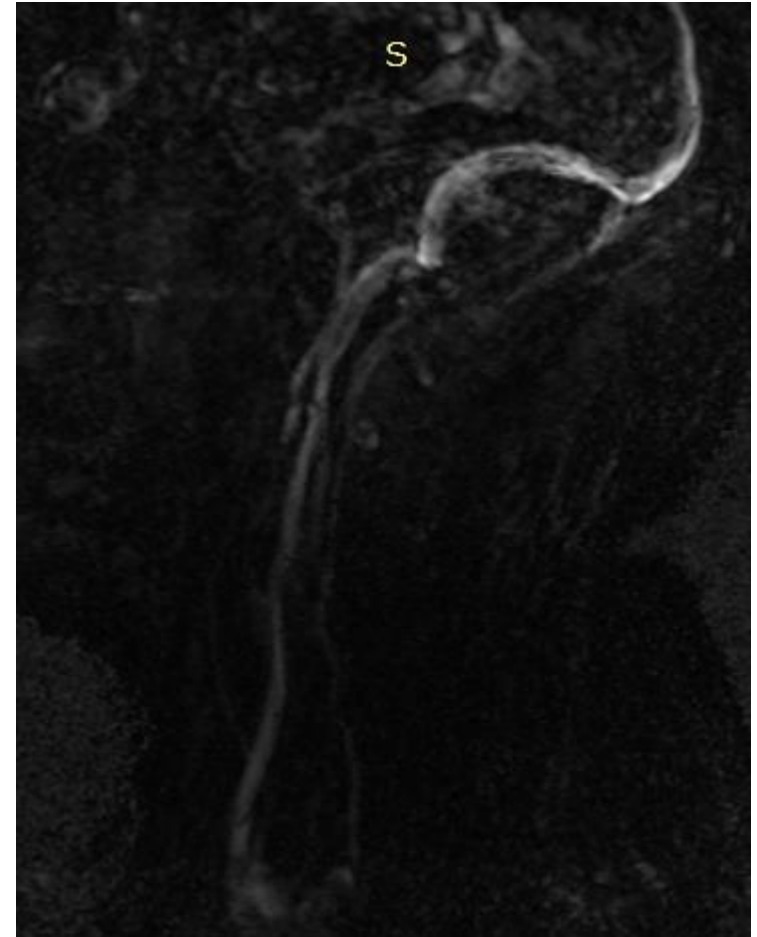


3. Fare clic su **Accept**

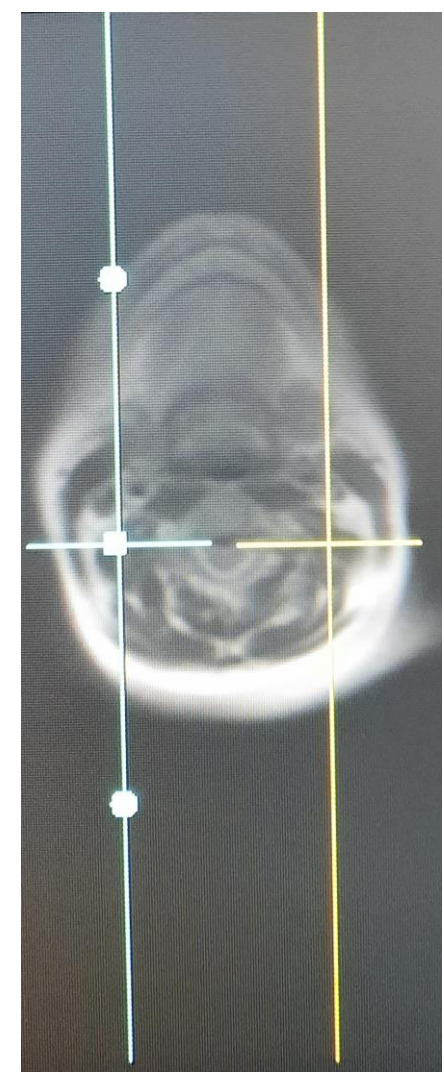
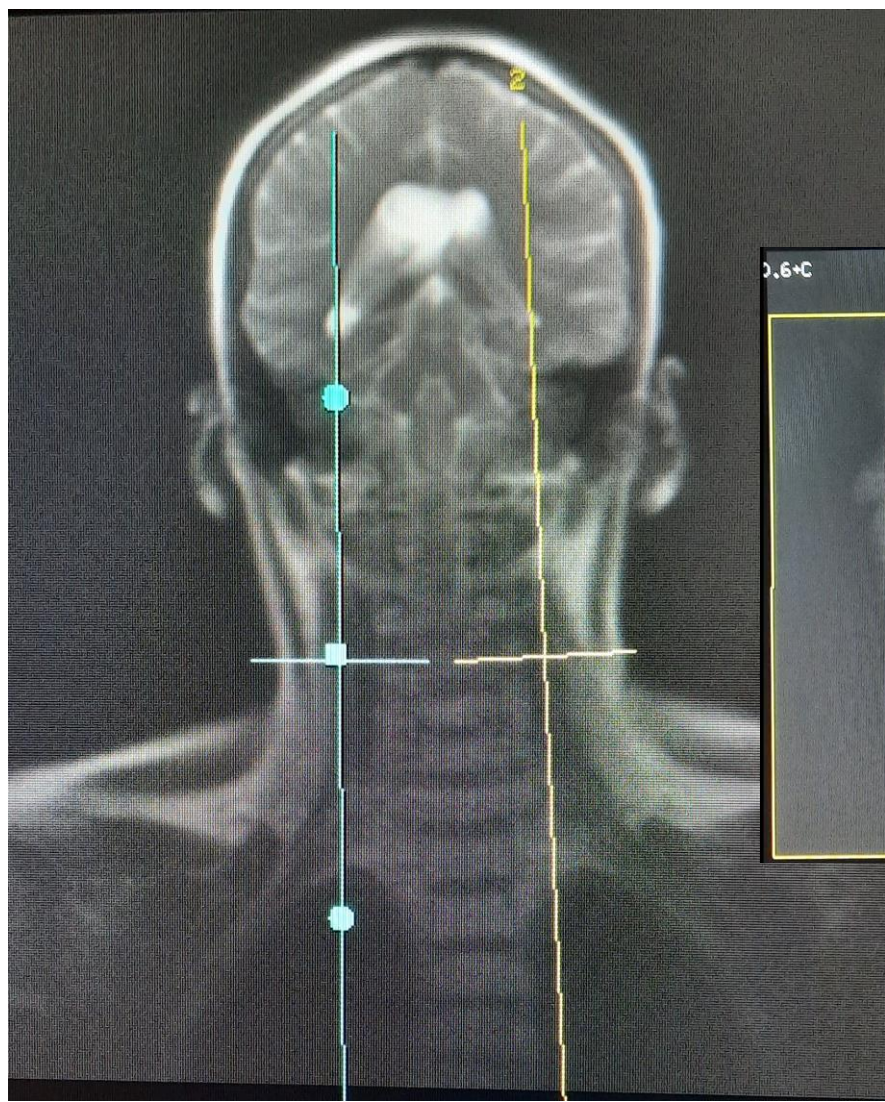


SAG 2D PHASE CONTRAST

Per un corretto centraggio della sequenza angio è consigliabile eseguire una sequenza «Phase contrast», sul piano sagittale. Ovviamente senza mdc. Non è richiesta una risoluzione elevata.



SAG 2D PHASE CONTRAST



SAG 2D PHASE CONTRAST

Details Vascular **Advanced**

Phase Contrast

Collapse: On Off

Flow Recon Type: **Complex Diff.**

Flow Analysis: On Off

Velocity Encoding: **80.0** 0.5 Min. 550.0 Max.

Acquisition Flow Direction Images: **ALL**

Additional Flow Images:

- Oblique R/L Flow
- Oblique A/P Flow
- Oblique S/I Flow
- MAG**

Head First, Supine

Imaging Options...

**2D Vasc PC
FC**

Anatomical Region...

Carotid Artery



L'impostazione della sequenza CEMRA in coronale avviene sulla Sag Phase Contrast precedentemente acquisita

CEMRA RM3

3D Cor CEMRA FT GRx 0:35(0:17)

Scan Plane: **Oblique** Freq. Dir: **S/I**

Freq. FOV: **30.0** TR: **4.2**

Phase FOV: **0.90** # Slabs: **1**

No Phase Wrap: **1.00** Locs per Slab: **76**

Slice Thickness: **1.4**

Max # Slices: **630**

of Acqs: **1**

Rel. SNR(%) **86**

Pixel Size: **0.8x1.2**

BW/Pixel: **434.0**

	R/L	A/P	S/I
Start	L11.9	A39.1	I99.2
End	R19.1	P54.9	I89.7

Chem SAT: **None**

Contrast: Agent Y Amt

WB-SAR: 1.04 Head-SAR: 2.78 B₁₊RMS: 2.48µT Mode: First dB/dt: First





Head First, Supine

**Imaging
Options...**

**3D Vasc TOF SPGR
EDR, Fast, ZIP512, ZIP2, Fluoro, ARC, MPh**

**Anatomical
Region...**

Carotid Artery

**Coil: Body Anterior 30ch + 2 Head 48ch + Spine
Posterior 60ch**

CEMRA RM3

Vascular
Acceleration
Advanced

Details

Multi-Phase

Total Phases:

Phase Acquisition Order

Sequential Interleaved

Delay After Acq:

Apply To All Phases

Mask Phase

Pause After Mask

Auto Subtract Mask Phase

Accept Negative Pixels

Series Per Phase

Variable Delays

Preserve: Start Times Delays

Phase	Start	Delay (Sec)	Auto Voice
Initial		0	
1	00:00	1	
2	00:18		

Total Time : 00:35

Details

Multi-Phase

Vascular

Acceleration

Advanced

Phase: 2.00

Slice: 1.50

CEMRA RM3

Details

Multi-Phase

# of TE(s) per Scan:	1.0	Frequency:	384
TE:	linimum	Phase:	244
Flip Angle:	25	NEX:	1.00
Intensity Correction:	PURE	Bandwidth:	83.33
Calibration In Prescan:	On	Excitation Mode:	Selecti...
Intensity Filter:	D	Shim:	Auto
Save Original:	<input type="checkbox"/>	RF Drive Mode:	Quadr...
3D Geometry Correction:	<input type="checkbox"/>	Phase Correct:	Off

CEMRA RM1

Coil: (Auto) C Spine+Neck 36

Imaging Options...

Details Vascular Advanced



Time of Flight:

Projection Images: 19 ▼


Collapse: On Off

Carotid Artery


CEMRA RM1

Cor ceMRA FT elliptic GRX  0:56 


Scan Plane: **Oblique** ▼

Freq. FOV: **30.0** ▼ 


Phase FOV: **0.90** ▼

Slice Thickness: **1.4** ▼ 

Freq. Dir: **S/I** ▼

TR: **5.4** ▼ 


Slabs: **1**

Locs per Slab: **44** ▼ 

	R/L	A/P	S/I
Start	R1.2	A8.2	I151.8
End	R1.2	P46.4	I152.5

Max # Slices: **1024**

of Acqs: **1**

Rel. SNR(%) **100** 

Pixel Size: **0.7x1.2**

BW/Pixel: **299.0**

CEMRA RM1

Details

Vascular

Advanced

of TE(s) per Scan: 1.0

TE: minimum

Flip Angle: 25

Intensity Correction: NONE

Intensity Filter: None

Save Original:

3D Geometry Correction:

Frequency: 418

Phase: 256

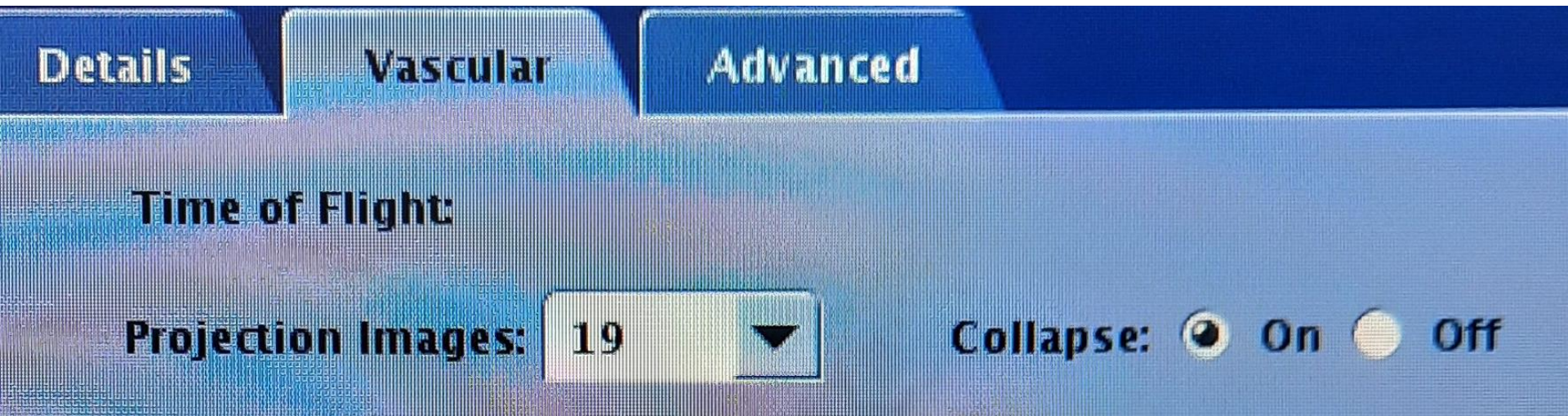
NEX: 1.00

Bandwidth: 62.50

Excitation Mode: Selecti...

Shim: Auto

Phase Correct: Off



Vascular		Advanced	
User Control Variables			
		Min	Max
Image acq. delay (sec):	<input type="text" value="0.00"/>	0.0	100.0
Turbo Mode (0= off, 1= Turbo):	<input type="text" value="0.00"/>	0.0	1.0
Reverse Elliptical Centric (0= off, 1= on):	<input type="text" value="0.00"/>	0.0	1.0
Elliptical Centric (0= off, 1= std, 2= delay):	<input type="text" value="1.00"/>	0.0	2.0
Centric (0= off, 1= on):	<input type="text" value="0.00"/>	0.0	1.0
Reverse Centric (0= off, 1= on):	<input type="text" value="0.00"/>	0.0	1.0
Real-time SAT (0= NON-axial, 1= Axial, 2= In-plane, 3= IRP):	<input type="text" value="1.00"/>	0.0	3.0
Restricted Real-time Navigation (0= Off, 1= On):	<input type="text" value="0.00"/>	0.0	1.0
Slice Resolution (70%- 100%):	<input type="text" value="100.00"/>	70.0	100.0

CEMRA RM1

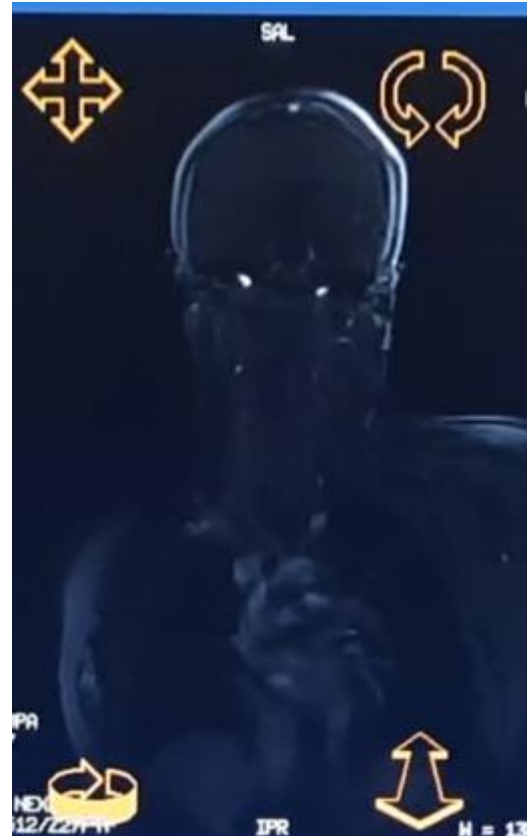
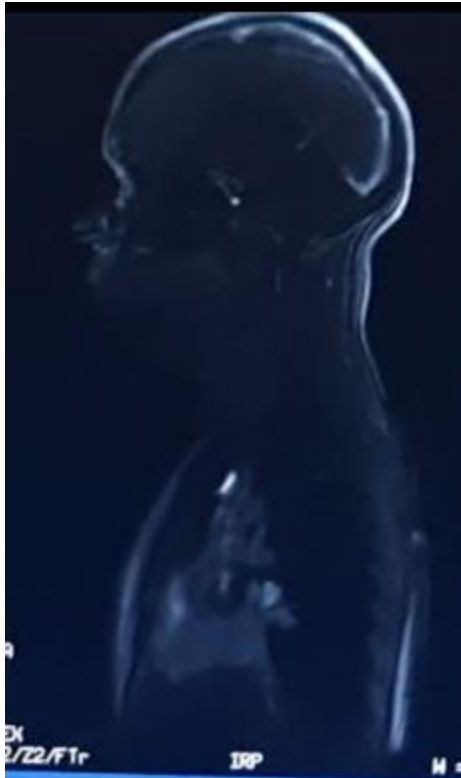
Attenzione al ritardo di acquisizione dell'immagine. Questo tempo può essere utilizzato per fornire al paziente informazioni sulla respirazione. Nell'angio-TSA deve essere uguale a 0.



Le opzioni di riempimento dello spazio K sono comprese tra la CV utente 11 e la CV14. I parametri dipendono dall'anatomia da sottoporre alla scansione.

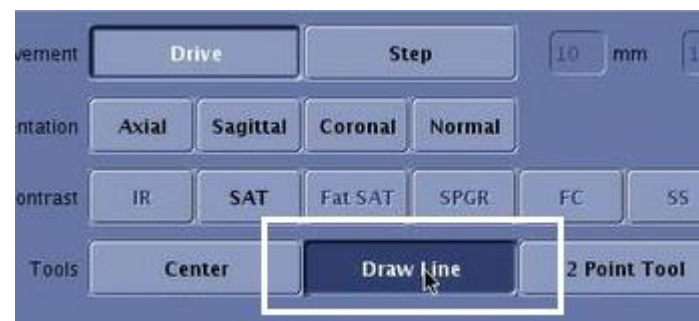
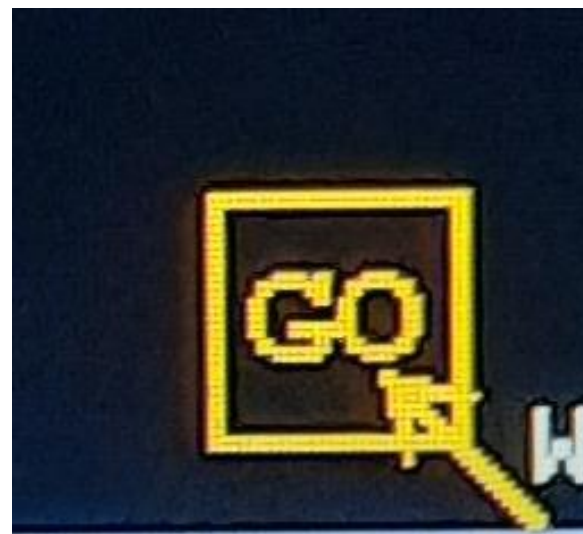
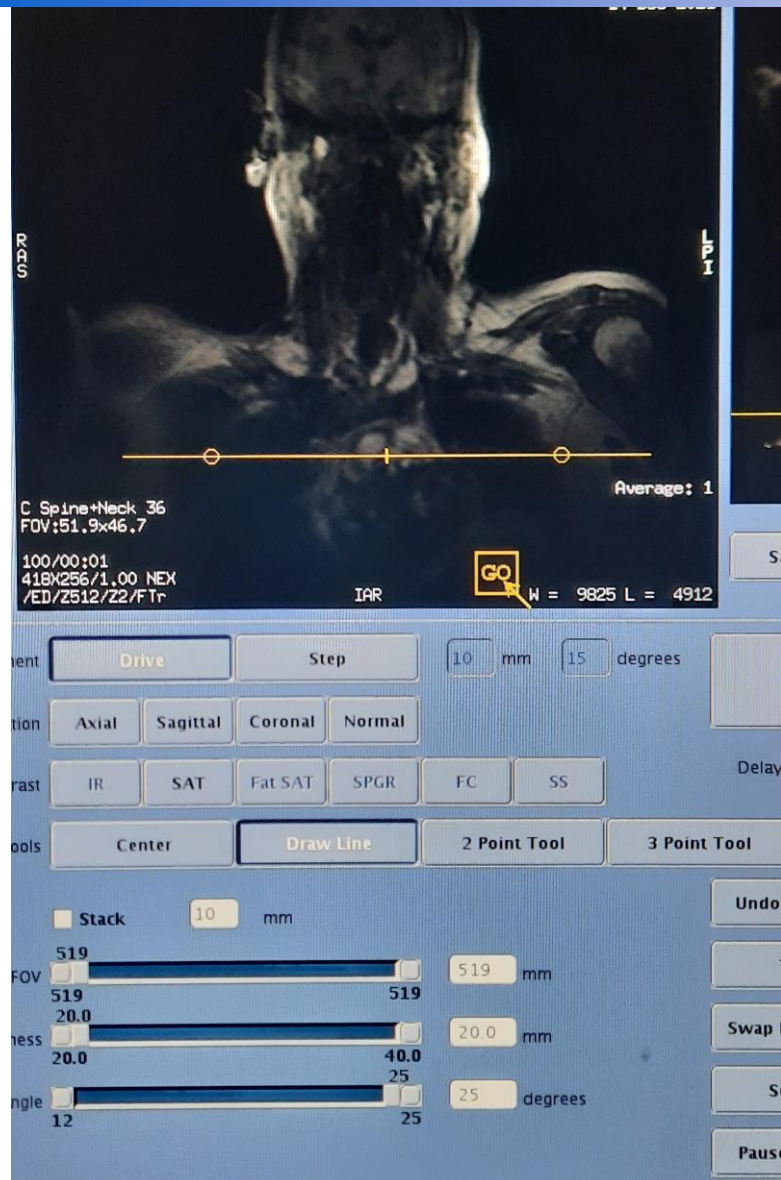
FLUORO

Appena inizia la sequenza, parte il Fluoro Trigger.
Aspettiamo di ottenere i 3 piani di localizzazione spaziale (assiale, sagittale, coronale)

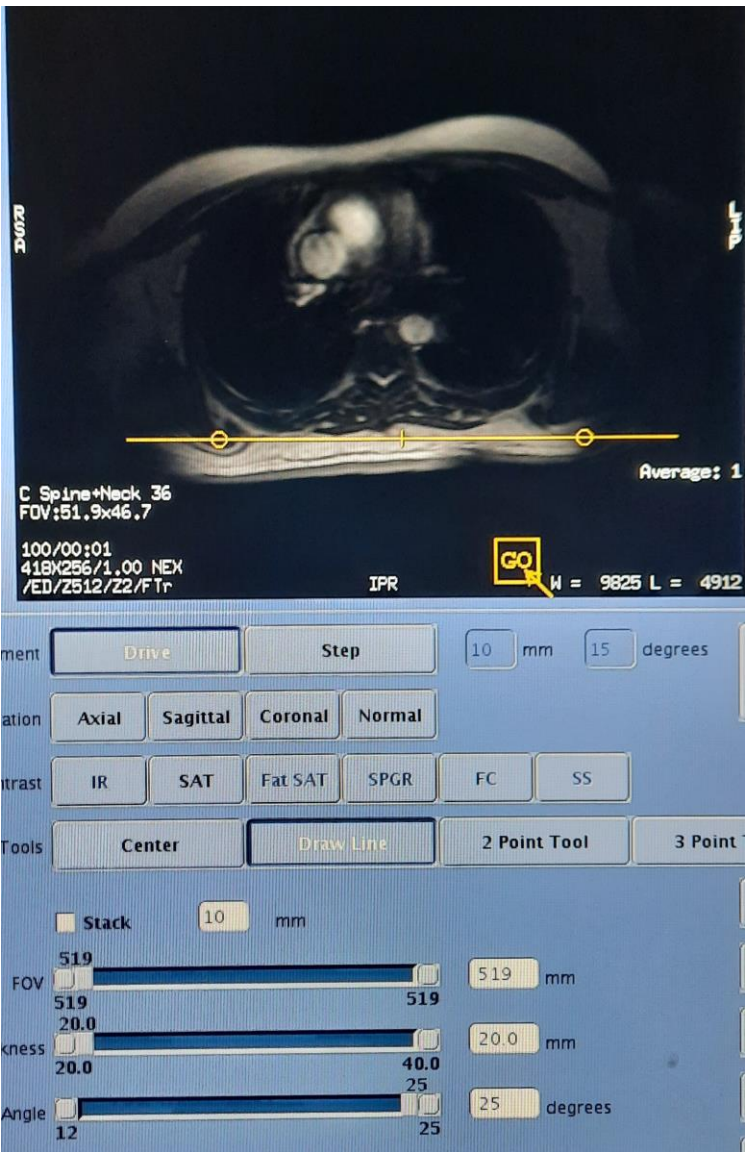


FLUORO

Posizionare la Draw Line sull'arco aortico e poi fare clic su «Go» ...

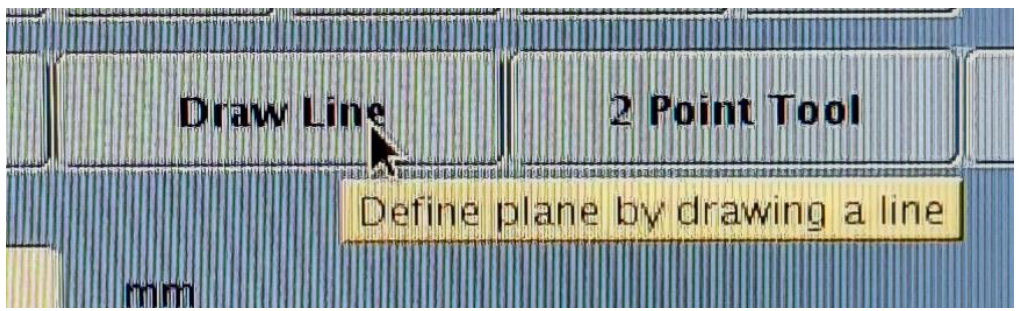


FLUORO



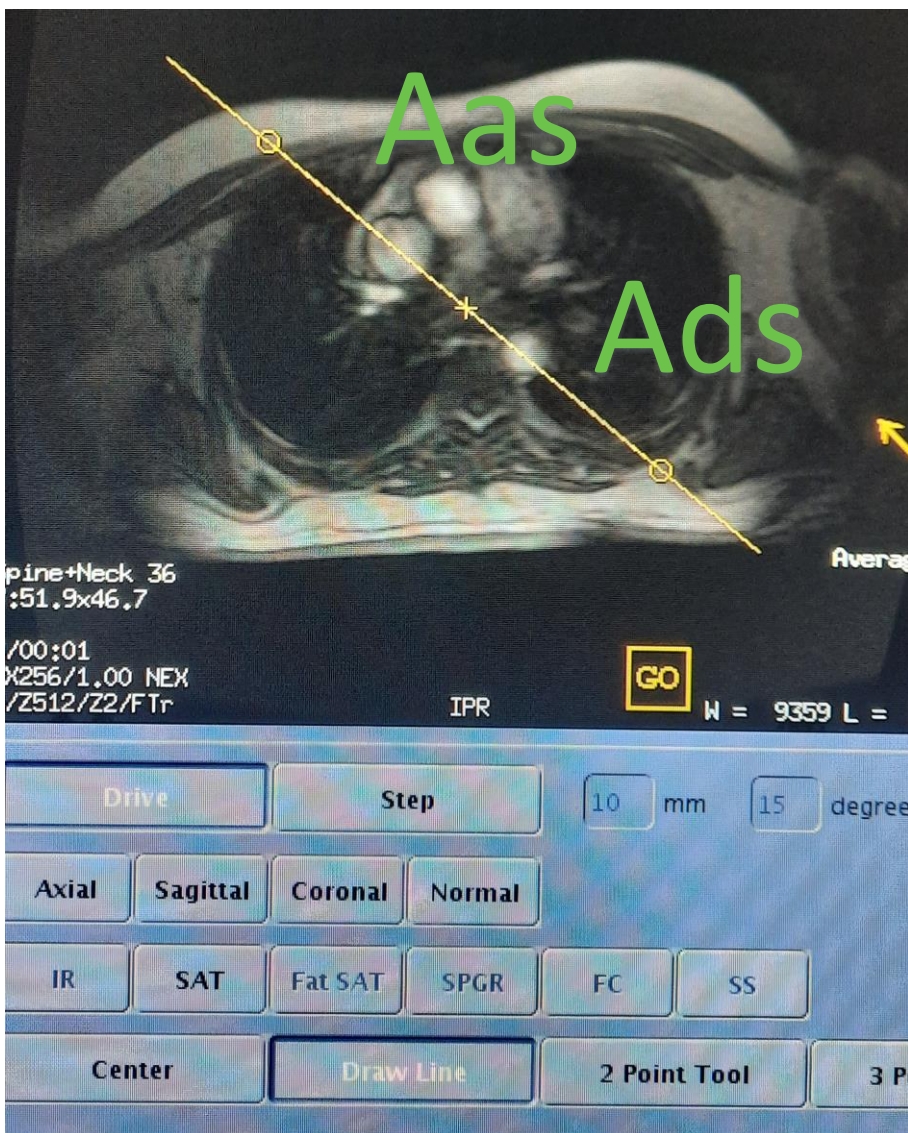
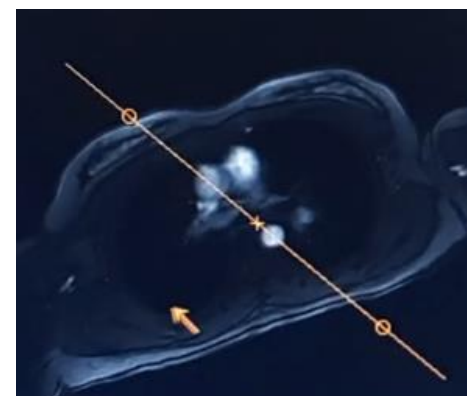
Fluoro

Aspettare qualche secondo e apparirà questa immagine ...



Fluoro

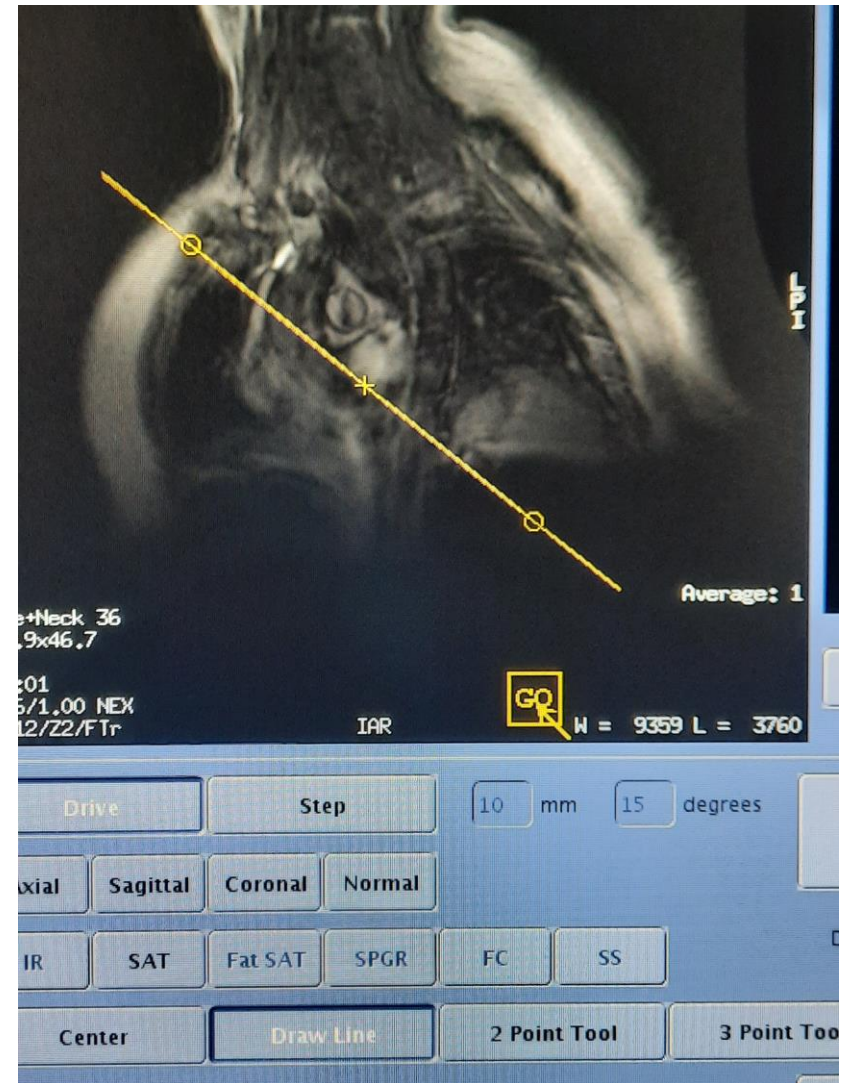
A questo punto posizionare la «Draw Line» unendo l'aorta ascendente e l'aorta discendente. Una bisettrice che unisce questi due punti.

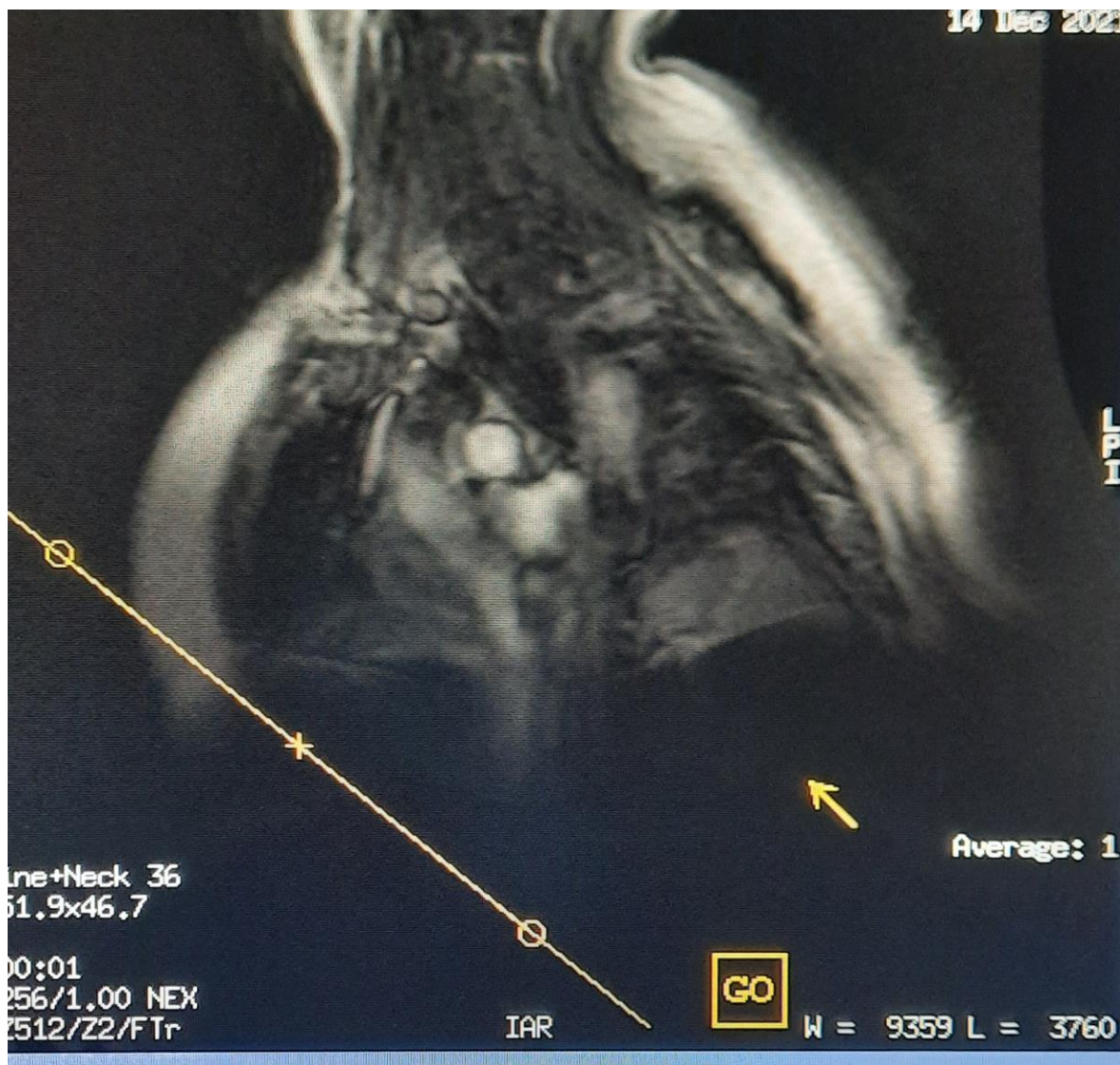


Apparirà questa immagine ...



Fluoro

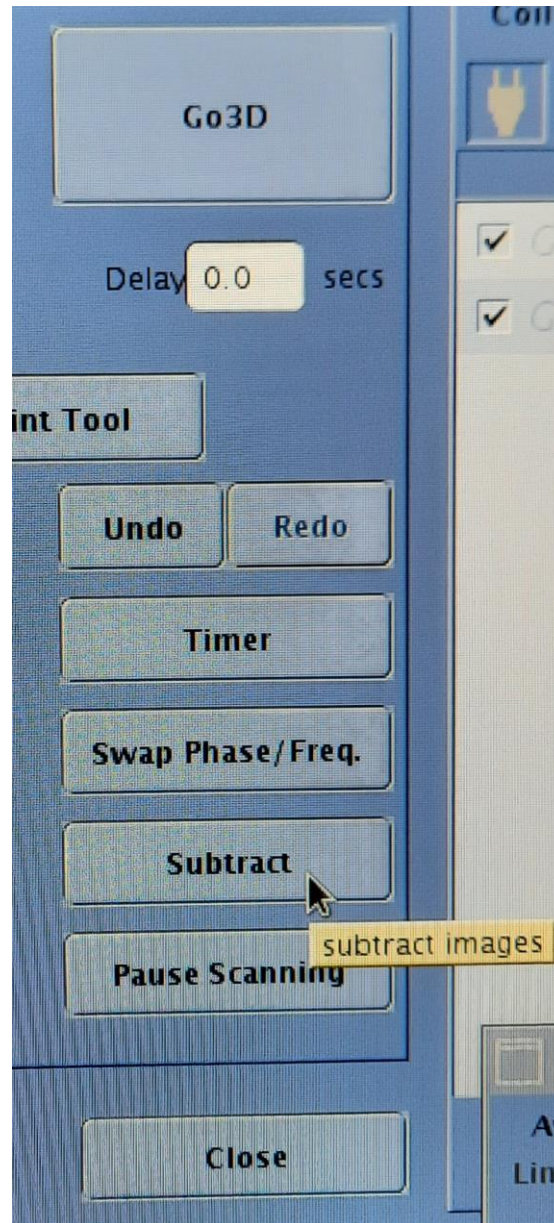




Fluoro

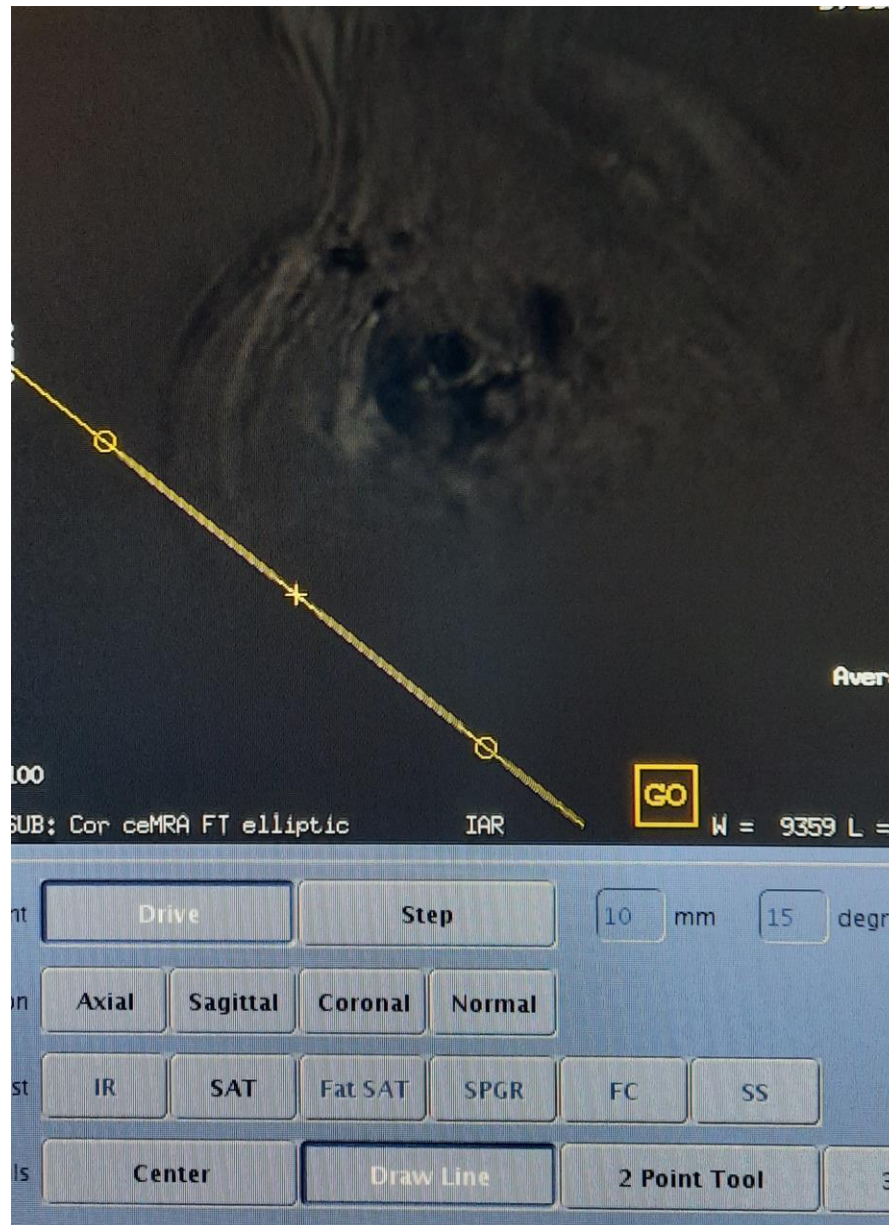
Possiamo spostare in basso la linea in modo che non ci copra la zona di interesse ...

Fluoro



Fare clic su
«Subtract»...

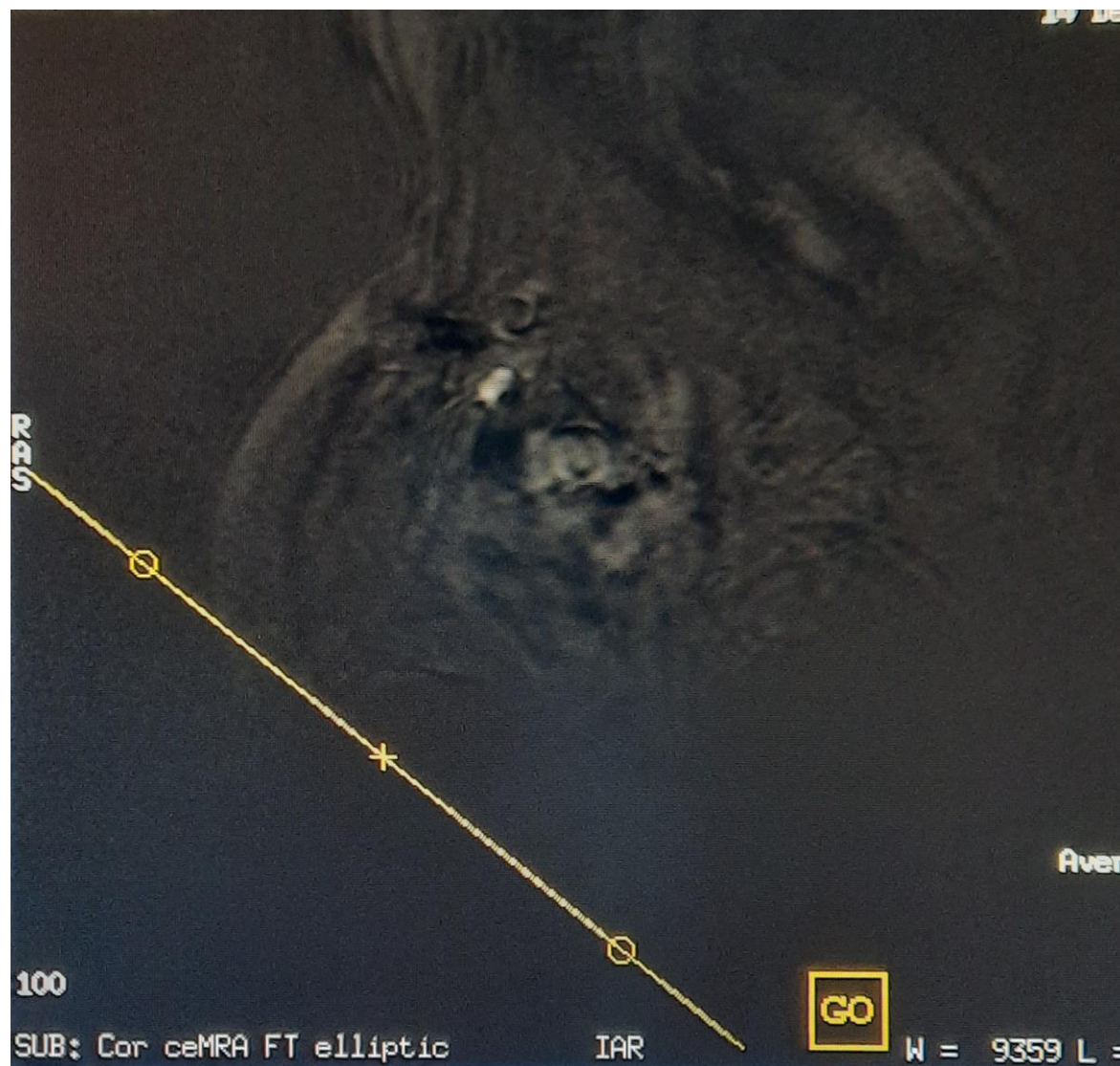
Fluoro



Apparirà
l'immagine
sottratta...

Fluoro

Per migliorare il contrasto dell'immagine fare clic con il mouse trascinandolo verso l'alto...



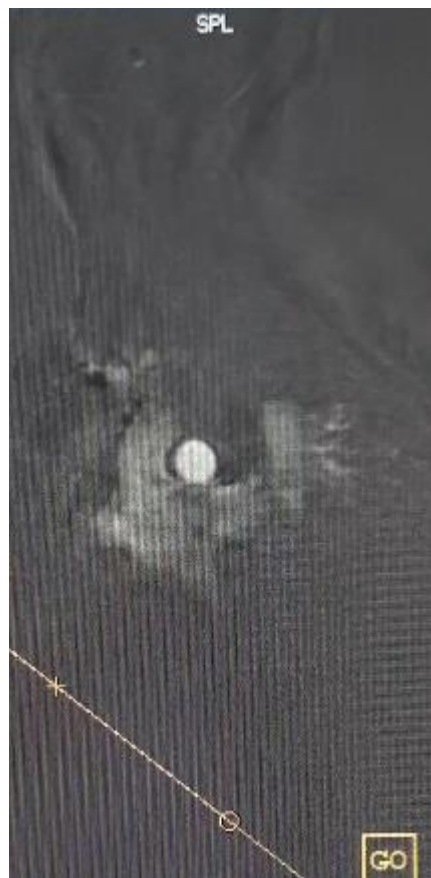
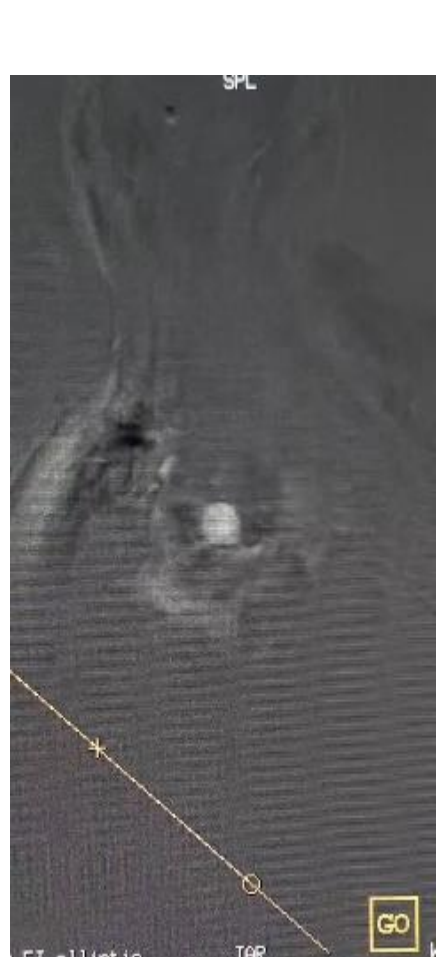
Fluoro

Possiamo anche regolare lo spessore della sezione per ottimizzare la visualizzazione vascolare.

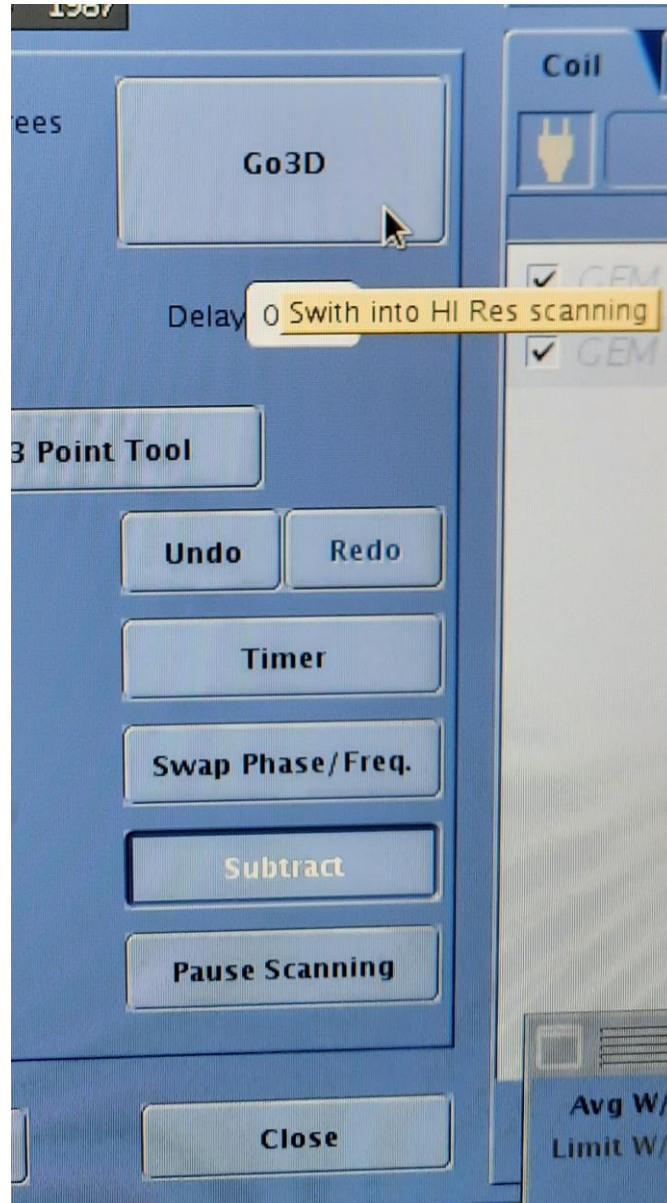
The screenshot shows a control panel for a medical imaging system. Key settings include:

- Movement:** Drive (selected), Step, 10 mm, 15 degrees, Go3D
- Orientation:** Axial, Sagittal, Coronal, Normal
- Contrast:** IR, SAT, Fat SAT, SPGR, FC, SS, Delay 0.0 secs
- Tools:** Center, Draw Line, 2 Point Tool, 3 Point Tool
- Stack:** 10 mm
- FOV:** 658 mm
- SliceThickness:** 20.0 mm (highlighted with a red box and a large '3')
- FlipAngle:** 10 degrees
- Buttons:** Undo, Redo, Timer, Swap Phase/Freq., Subtract, Pause Scanning

Seguiamo il passaggio del mezzo di contrasto ...



Fluoro



Appena vedremo il contrasto che inizia a riempire le carotidi premiamo immediatamente «Go3D». Partirà la scansione vera e propria

