BREAST MRI PROTOCOLS

Updated
03/14/2018

Routine Bilateral w/wo	Silicone Breast Implant	Post Biopsy Additional View
Right Unilateral w/wo	Saline Breast Implant	
Left Unilateral w/wo	Biopsy	

Breast (Bilateral w/wo)

**Position the patient head first and prone. Position the breasts with the nipples in profile. Use markers for the nipples and recent biopsies*
FOV can be adjusted to patient size (approximately 280mm to 360mm)

AX STIR

AX Views (T1/VIBE)

AX Views FS Pre (T1 FS/VIBE FS)

- Must be under 2 minutes
- Do not send this image, use this image to check FS

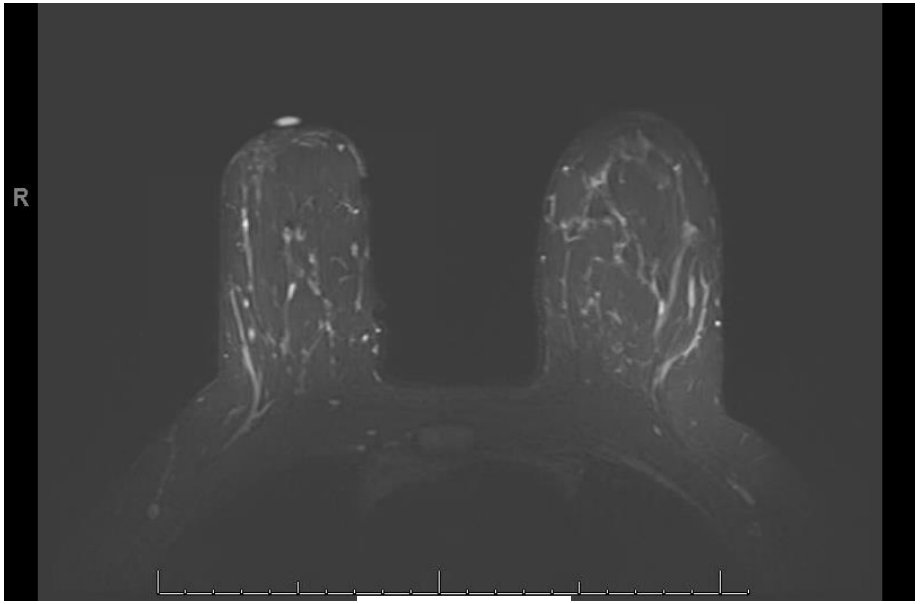
AX Views FS Post (T1 FS/VIBE FS)

- 6 Measurements
- 1 measurement pre contrast -> 45 second delay -> 5 measurements
- Inject contrast immediately upon completion of the first measurement
- Injection should be at 3mL/second

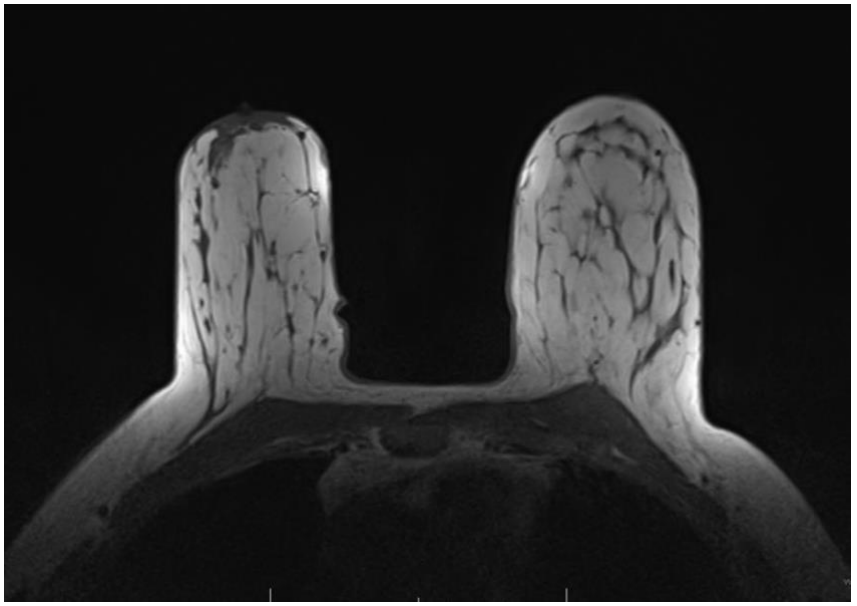
SAG Views Post (T1 FS/VIBE FS)

Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
AX STIR	3850	70	300	100%	3	1	80%	448	R/L	3		
AX Views	5.43	2.46	300	100%	1.5	20%	403	448	R/L	1		
AX Views FS Pre	4.20	2.01	300	100%	1.5	20%	384	384	R/L	1		Must be under 2 minutes
AX View FS Post	4.20	2.01	300	100%	1.5	20%	384	384	R/L	1		Dynamic 6 Measurements
SAG Views Post	4.05	1.51	250	100%	1.5	20%	282	352	S/I	1		

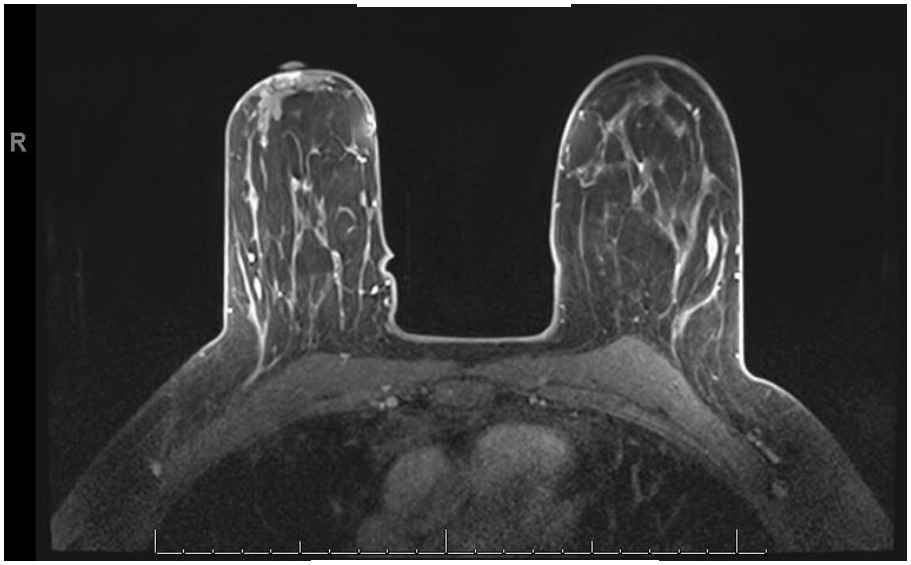
Breast (Bilateral w/wo) Continued



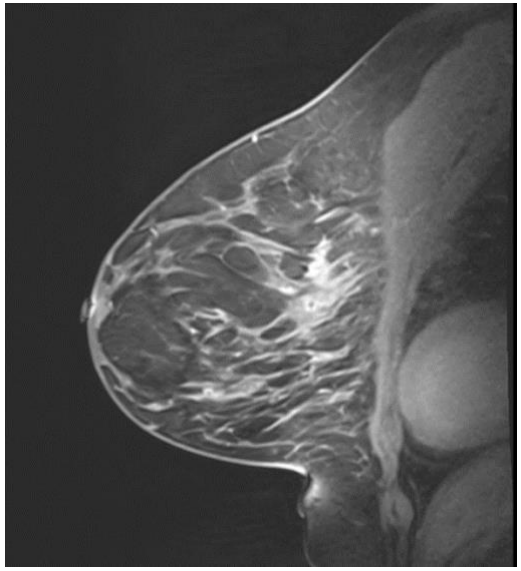
Axial STIR



Axial Views (no FS)



Axial VIEWS FS Post



Sagittal VIEWS FS Post

Right Unilateral w/wo

**Position the patient head first and prone. Position the breasts with the nipples in profile. Use markers for the nipples and recent biopsies*

Right AX STIR

Right AX Views (T1/VIBE)

Right AX Views FS Pre (T1 FS/VIBE FS)

- Must be under 2 minutes
- Do not send this image, use this image to check FS

Right AX Views FS Post (T1 FS/VIBE FS)

- 6 Measurements
- 1 measurement pre contrast -> 45 second delay -> 5 measurements
- Inject contrast immediately upon completion of the first measurement
- Injection should be at 3mL/second

Right SAG Views Post (T1 FS/VIBE FS)

Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
Right AX STIR	3850	70	250	100%	3	1	80%	448	R/L	4		
Right AX Views	5.43	2.46	220	100%	1.5	20%	403	448	R/L	1		
Right AX Views FS Pre	4.20	2.01	220	100%	1.5	20%	384	384	R/L	1		Must be under 2 minutes
Right AX View FS Post	4.20	2.01	220	100%	1.5	20%	384	384	R/L	1		Dynamic 6 Measurements
Right SAG Views Post	4.05	1.51	250	100%	1.5	20%	282	352	S/I	1		

Left Unilateral w/wo

**Position the patient head first and prone. Position the breasts with the nipples in profile. Use markers for the nipples and recent biopsies*

Left AX STIR

Left AX Views (T1/VIBE)

Left AX Views FS Pre (T1 FS/VIBE FS)

- Must be under 2 minutes
- Do not send this image, use this image to check FS

Left AX Views FS Post (T1 FS/VIBE FS)

- 6 Measurements
- 1 measurement pre contrast -> 45 second delay -> 5 measurements
- Inject contrast immediately upon completion of the first measurement
- Injection should be at 3mL/second

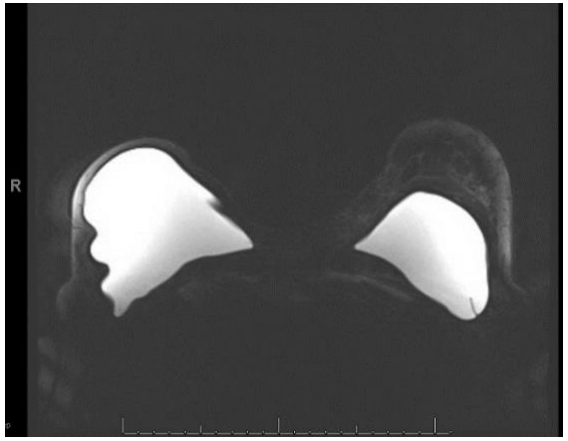
Left SAG Views Post (T1 FS/VIBE FS

Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
Left AX STIR	3850	70	250	100%	3	1	80%	448	R/L	4		
Left AX Views	5.43	2.46	220	100%	1.5	20%	403	448	R/L	1		
Left AX Views FS Pre	4.20	2.01	220	100%	1.5	20%	384	384	R/L	1		Must be under 2 minutes
Left AX View FS Post	4.20	2.01	220	100%	1.5	20%	384	384	R/L	1		Dynamic 6 Measurements
Left SAG Views Post	4.05	1.51	250	100%	1.5	20%	282	352	S/I	1		

Silicone Breast Implant

**Position the patient head first and prone*
Coverage only need to include the breast implant

Axial STIR
Right Sagittal STIR Water Sat
Left Sagittal STIR Water Sat
Right Axial STIR Water Sat
Left Axial STIR Water Sat
Right Sagittal STIR Silicone
Left Sagittal STIR Silicone
Right Axial STIR Silicone
Left Axial STIR Silicone

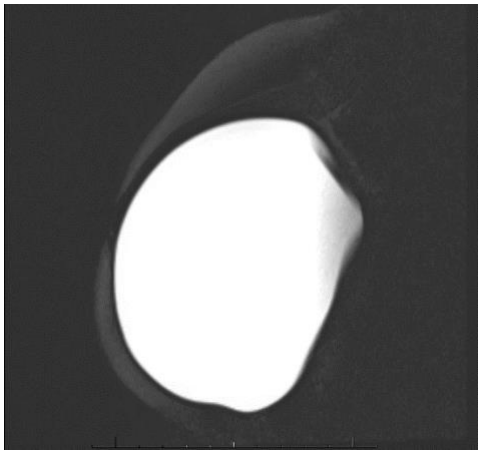


Ax STIR

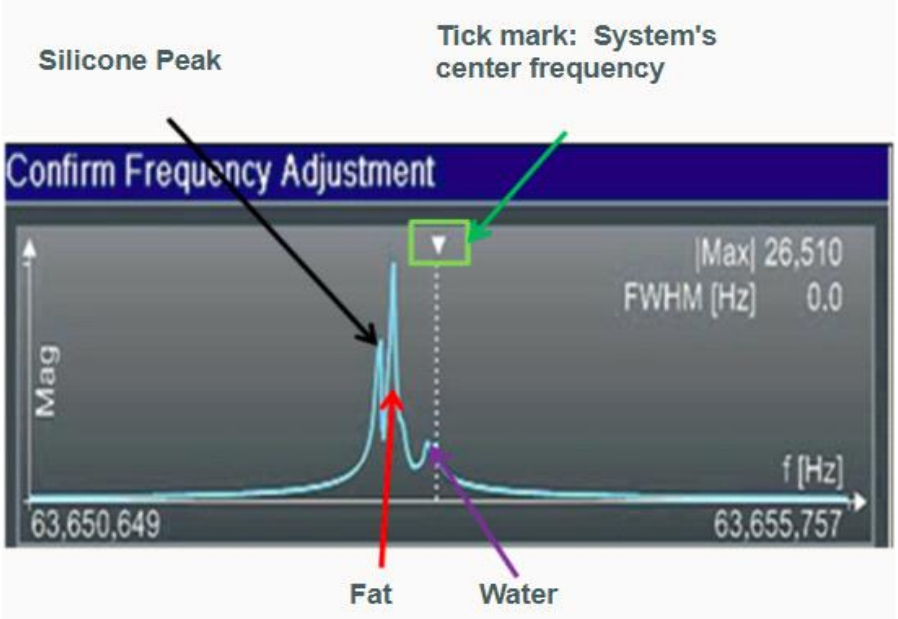
Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
Ax STIR	3900	64	340	340	4	0.8	326	384	R/L	1	S->I	
RT Sag STIR Water Sat	4000	64	200	200	4	0.4	192	256	S/I	1	L-R	Bright Silicone/Dark Fat/Dark Water TI: 230 (3T), 150 (1.5T) Confirm Frequency: select water peak (suppress H2O)
LT Sag STIR Water Sat	4000	64	200	200	4	0.4	192	256	S/I	1	L-R	
RT Ax STIR Water Sat	4000	64	220	220	4	0.4	192	256	R/L	1	S->I	
LT Ax STIR Water Sat	4000	64	220	220	4	0.4	192	256	R/L	1	S->I	
RT Sag STIR Silicone	4000	64	200	200	4	0.4	192	256	S/I	1	L-R	Dark (gray) Silicone/Bright Fat TI: 500 (3T) Confirm Frequency: select silicone peak (suppress silicone)
LT Sag STIR Silicone	4000	64	200	200	4	0.4	192	256	S/I	1	L-R	
RT Ax STIR Silicone	4000	64	220	220	4	0.4	192	256	R/L	1	S->I	
RT Ax STIR Silicone	4000	64	220	220	4	0.4	192	256	R/L	1	S->I	

Silicone Breast Implant Continued

**These techniques are tailored specifically for the SIEMENS scanners which use a Water Saturation Technique (located under the contrast tab) rather than a Fat Saturation technique. Water Saturation is a frequency selected saturation and will saturate the selected peak.*



SAG STIR w/ Water Saturation RT

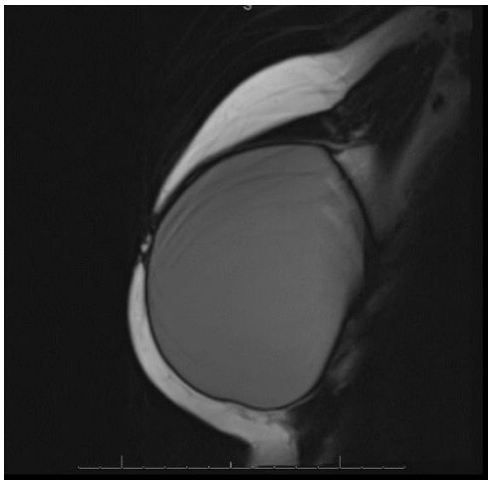


STIR w/ Water Saturation

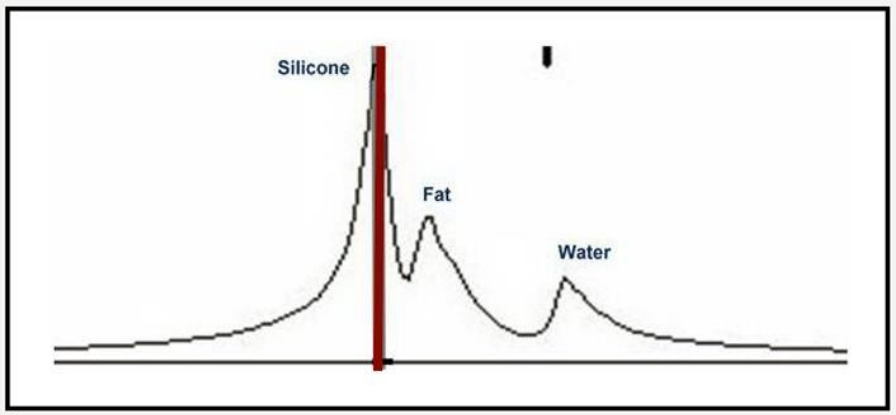
Confirm Frequency:

Water and Fat need to be suppressed – The TI time suppresses the fat. Adjust the system's center frequency to be centered on water to suppress the water. Left click on the peak then select "apply"

Only silicone should be bright



SAG STIR Silicone RT



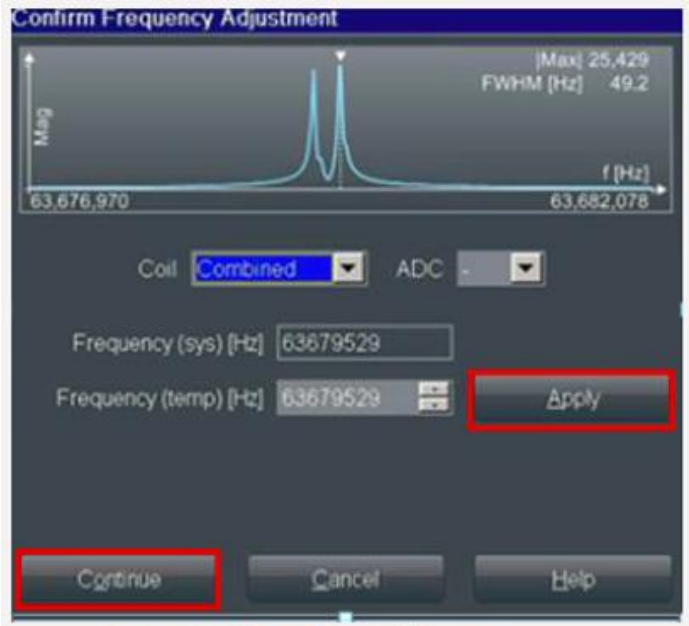
STIR Silicone

Confirm Frequency:

Silicone needs to be suppressed – Adjust the system's center frequency to be centered on silicone to suppress signal from the silicone implant. Left click on the peak then select "apply"

Saline Breast Implant

Right Sagittal STIR
Left Sagittal STIR
Right Axial STIR
Left Axial STIR



Two peaks – fat and water
Saline Implants

STIR with Saline Implant

Confirm Frequency:

There is no need to manually adjust peaks with saline implants while running a STIR. The TI time will suppress the fat, so water (including the saline implant) will be bright.

Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
RT Sag STIR	4210	82	220	100%	4	0.8	256	320	R/L	2	L->R	Dark Fat/Bright Water/Bright Implant TI: 230 (3T), 150 (1.5T)
LT Sag STIR	4210	82	220	100%	4	0.8	256	320	R/L	2	L->R	
RT Ax STIR	4210	82	220	100%	4	0.8	256	320	R/L	2	L->R	
LT Ax STIR	4210	82	220	100%	4	0.8	256	320	R/L	2	L->R	

Breast Biopsy

**Position the patient head first and prone with the opposite breast positioned up and away from the affected breast. A medial or lateral approach will be determined by the radiologist.*

Sagittal FS Pre
Axial FS Pre
Ax FS Post
Sagittal FS Post (as indicated by the radiologist)

Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
Sag FS Pre/Post	4.58	1.74	240	100%	1.5	20%	403	448	S/I	1	L->R	Coverage to include the entirety of the bunny ears
Right AX Views Pre/Post	4.58	1.74	240	100%	1.5	20%	403	448	A/P	1	S->I	

Post Biopsy Additional View (no contrast)

**Position the patient head first and prone. Position the breasts with the nipples in profile. Use markers for the nipples and recent biopsies*
FOV can be adjusted to patient size (approximately 280mm to 360mm)
To be scanned, as indicated, after an ultrasound guided breast biopsy

AX Views FS (T1 FS/VIBE FS)
SAG Views (T1 FS/VIBE FS)

Sequence	TR	TE	FOV		SLICE	GAP	MATRIX		PHASE DIR	NEX	SCAN DIR	OTHER
			FREQ	PHASE			PHASE	FREQ				
AX Views FS	4.20	2.01	300	100%	1.5	20%	384	384	R/L	1	S->I	
SAG Views FS	4.05	1.51	250	100%	1.5	20%	282	352	S/I	1	L->R	