

MR Lymphangiography: Abdomen/chest

Coverage: Abdomen from lesser trochanter to thoracic inlet

Place on a table top with posterior coil elements underneath. The posterior coil will remain under the patient all the time even during the injection of contrast into the groin lymph nodes.

Pre-contrast:

1. Localizers
2. Axial T2 FSE fat sat (4mm) **~4-5 min**
3. Axial single-shot T2 fat sat TE 160ms (3 mm)- pull from MRCP **~4 min**
4. Coronal single-shot T2 fat sat TE 160ms (3 mm)- pull from MRCP **~4 min**
5. Coronal T1 3D MRCP (Te700-800ms) **~4-5 min**
6. Coronal eTHRIVE/VIBE/LAVA **~20-30 sec**
7. Axial eTHRIVE/VIBE/LAVA **~20-30 sec**

Contrast: Standard dose Gadovist 1:1 dilution

Post-contrast:

Angiocath will be placed under ultrasound guidance outside the MRI scanner and then the table will be moved into the scanner. Injection of the contrast will be performed on the table after patient is positioned, coils are connected and localizers are obtained. First run starts immediately after the start of intranodal contrast injection.

1. Coronal eTHRIVE/VIBE/LAVA every minute till 5 minutes and more (till contrast seen in the venous angle) if required till 20 minutes- **~20-30 sec each run**
2. Axial eTHRIVE/VIBE/LAVA as required in between coronal THRIVE **~20-30 sec**
3. Coronal T1 TSE Fat sat NEX 4-6 (3mm) **~4-5 min (optional)**
4. Axial T1 TSE Fat sat NEX 4-6 (3mm) ROI **~4 min (optional)**

Table 1: Sickkids MR Lymphangiography protocol

Seq #	Sequence	Plane	TR/TE (ms)	Flip angle (degrees)	Matrix/SL	ETL	NSA	Pixel Band-width (Hz)	Approximate Time
1	T2 FSE	Axial	2174/80	90	316x211/4mm	24	2	280	5 min
2	Single-shot T2 fatsat	Coronal	2248/160	90	264x230/3mm	96	1	399	3 min
3	Single-shot T2 fatsat	Axial	1376/160	90	268x237/3mm	98	1	404	4 min
4	3D T2 FSE	Coronal	3168/740	180	288x256/2mm	129	1	167	4 min
5	T1W 3D GRE (VIBE/THRIVE/LAVA)	Coronal	3.5/ 1.7	10	308x362/2.6mm	1	1	574	20-30 sec
GBCM 0.1mmol/kg, 1:1 or 1:2 dilution; half dose on each side groin lymph node hand injected slowly(approx 0.5-1 ml/min)									
6	T1W 3D GRE (VIBE/THRIVE/LAVA) every minute till contrast seen at the venous angle.	Coronal	3.5/ 1.7	10	308x362/2.6mm	1	1	574	20-30 sec
7	T1W 3D GRE (VIBE/THRIVE/LAVA)	Axial	3.1/ 1.5	10	180x180/3mm	1	1	720	20-30 sec

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ETL = echo train length; NSA = number of signal averages; SL = slice thickness.

FSE = fast spin-echo; GRE = gradient echo; LAVA = liver acquisition with volume acquisition; THRIVE = T1-weighted high-resolution isotropic volume examination; VIBE = volumetric interpolated breath-hold examination.