

## SMRT Student Scope Submission

### Title and Author

Title: Portal Hypertension

Author: Tasha Olson

E-mail: [tmolson@unmc.edu](mailto:tmolson@unmc.edu)

Expected date of graduation: August 2008

Education Coordinator: Adam Stevens BSRT (R)(CT)(MRI)

Author E-mail: [tmolson@unmc.edu](mailto:tmolson@unmc.edu)

Affiliation: University of Nebraska Medical Center

Date of Submission: April 17, 2008

### Introduction or Patient History



A 70-year-old male with elevated liver function tests (LFTs), an elevated ammonia level, and a history of Hepatitis A. Previous imaging studies include an ultrasound (US) of the right upper quadrant. The study was limited by a large amount of bowel gas in the abdomen but findings suggested portal hypertension due to a dilated periumbilical vein. It was also noted that the liver appeared abnormal but other studies were needed to determine the underlying etiology. It was suggested that the patient have a magnetic resonance imaging (MRI) exam of his abdomen. Both computed tomography (CT) and MRI are excellent modalities in providing quality information when US findings are inconclusive.

### Patient Preparation and Scan Set up



Before arriving to the MRI department, the patient fills out a screening sheet three times. This occurs once in the Doctor's office, once in scheduling, and once again on the day of their exam upon arrival to the department. The MRI technologist had the patient change into a hospital gown. History was taken and the technologist screened the patient once again to make sure the patient had no metal on them. After the patient was changed into a gown and screened, they were taken to the 1.5 Tesla (T) Philips exam room where they were placed on the table and positioned for the exam. A SENSE-body coil was placed around the patient's abdomen along with the sense breathing apparatus. A cushion was placed under the knees to alleviate back pain and the call button was given to the patient in the case of an emergency. The patient was given headphones for their hearing protection.

## MR Imaging Parameters



Nine imaging sequences were performed on the patient's abdomen to look for the etiology. A total of 15 cc Multihance (gadobenate dimeglumine) was administered for the contrast images. On the in-phase and out-of-phase imaging, the patient was asked to hold his breath. Each breath hold lasted anywhere from 12-15 seconds and occurred four times in the in-phase and out-of-phase imaging.

<b>Sequence Matrix NEX</b>	<b>FOV</b>	<b>Slices</b>	<b>TR</b>	<b>TE</b>	<b>Spacing</b>
Coronal FFS-T2 256x256 1	100	25	610	80	7 skip 1.0
In-phase Axial FFS 256x256 1	75	30	109	2.3	7 skip 1.0
Out-of phase Axial FFS 256x256 1	75	30	109	2.3	7 skip 1.0
Axial FFS-T1 256x256 2	70	34	160	4.6	7 skip 1.0
Axial FFS-T2 256x256 1	70	32	434	80	7 skip 1.0
Axial FFS-T2 F/S 512x512 2	75	30	419	80	7 skip 1.0
Axial FFS-Thrive Pre 256x256 2	70	75	3.4	1.7	3.5 Contig
Axial FFS-Thrive Post 256x256 2	70	75	3.4	1.7	3.5 Contig
Coronal FFS-Thrive 256x256 1	100	55	4.1	2	4.0 Contig

## Findings and Discussions



The results of the abdomen MRI demonstrated advanced liver cirrhosis which was seen with the nodular serosal surface. This was associated with a dilated collateral vein within the falciform ligament connecting the portal system to the dilated umbilical vein which extended down the right anterior abdominal wall into the pelvis. Ascites was also noted over the right lobe of the liver. Most patients with portal hypertension have symptoms such as gastrointestinal bleeding (due to the spontaneous rupture of varices), ascites, confusion and forgetfulness (due to poor liver function), and reduced levels of platelets and white blood cells.

## Conclusions



When researching this case, I learned that the most common cause of portal hypertension is cirrhosis. Cirrhosis is caused by hepatitis, alcohol abuse or scarring from a liver injury. Other causes may include blood clots in the portal vein, stenosis in the veins that carry blood from the liver to the heart and a parasitic infection called schistosomiasis. Portal hypertension cannot be treated. Treatment includes focusing on the complications. The main complication to focus on is the bleeding from the varices. This includes endoscopic therapy which is usually the first line of treatment and includes banding or sclerotherapy. Banding is a procedure in which rubber bands block off the blood vessel. Sclerotherapy uses a solution which is injected into the bleeding varices causing them to scar. This procedure is used when banding is not an option. Nadolol or propranolol, beta blockers, may be used to reduce the pressure in the varices and reduce the risk of bleeding. Eating a low-sodium diet and abstinence from over-the-counter prescription drugs and alcohol/street drugs help those individuals with portal hypertension maintain a healthy lifestyle and help their liver function properly.

## References



Carale, Jesus. (2006). Portal Hypertension. eMedicine.  
<http://www.emedicine.com/med/topic1889.htm>

Digestive Diseases: Portal Hypertension. MedicineNet.com  
(January 2005).  
[http://www.medicinenet.com/portal\\_hypertension/article.htm](http://www.medicinenet.com/portal_hypertension/article.htm)

O'Brien, Susan. MRI Technologist. Regional West Medical Center.  
3 March 2008.

## Images



