

## Case Report

# Riedel Fight Song: a case report of riedel lobe presumed to be hepatomegaly

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## ABSTRACT

Riedel lobe is a liver variation occasionally confused with an abdominal mass or hepatomegaly. The clinical infrequency of this condition and its resemblance to more serious conditions can initiate unnecessary workup or surgery if not considered early. An otherwise healthy, 14-year-old girl presented to the gastroenterology (GI) clinic for follow-up to an emergency room (ER) visit with a 3-day history of right upper quadrant (RUQ) pain. She reported during the first 24 hours a sharp, constant, non-radiating pain increased from 2 to 6/10, improved with ice and ibuprofen, and aggravated with activity and laying on her right side. Physical exam was significant for tenderness in the RUQ and liver edge palpated 2 finger breadths below the subcostal margin anteriorly and laterally to the iliac crest. Pain was reproduced by rotation of her trunk. Laboratory findings were unremarkable. Before further testing, the pediatric radiologist consulted identified the hepatomegaly as a “Riedel lobe, elongated and functional.” Further history elicited a social wrestling match the night prior to onset; repeat physical exam suggested a strain in the right upper rectus abdominis muscle. Relative rest, ice and ibuprofen for pain were prescribed and patient education was conducted. First reported in 1888 when seven cases were confirmed by surgical exploration, the incidence of Riedel lobe is now known to occur in approximately 25% of 20-45 year-olds and 60% of 45-65 year-olds, with female: male ratio of 3:1. Potential morbidities include lobar torsion, mass effect induced obstruction, interference with laparoscopic surgical procedures and unnecessary imaging. Clues from the history and physical exam can help distinguish this variant from other liver pathology. Physician awareness, the use of Doppler ultrasonography, and pediatric radiology consult should be considered before the use of more intensely radiating imaging.

**Keywords:** Pediatrics, Hepatomegaly, Riedel lobe, Radiology, RUQ pain, Right upper quadrant pain, Liver

## INTRODUCTION

Riedel lobe is a liver variation that may be clinically confused with an abdominal mass or pathological hepatomegaly.<sup>2</sup> The clinical infrequency of this condition and its resemblance to more serious diagnoses can initiate unnecessary workup or surgery if not considered in the initial differential.<sup>1</sup> In this case, a 14-year-old girl presenting with RUQ pain and enlarged liver on imaging was found to have Riedel lobe.

## CASE REPORT

A healthy, 14-year-old girl presented to her primary care manager with a 3-day history of right upper quadrant pain. She reported the pain increased over the first 24 hours from 2/10 to a constant 6/10, sharp, non-radiating pain. The pain improved with ice and ibuprofen, and was aggravated with activity and laying on her right side. The patient's only past medical history was significant for recurrent pharyngitis that caused her to miss school 1-2

times per month. She denied constitutional symptoms, change in abdominal girth, fatigue, or changes in appetite, bowel or bladder habits. She had no complaint of oral lesions, no recent bruising or bleeding, and no recent travel or trauma. Her recent activities in the last 4 days included spending time at home and “hanging out at her friends”. Her primary care manager sent her to the Emergency Room for urgent evaluation. Imaging was performed and she was given Ibuprofen for pain with instructions to follow up in the Pediatric Gastrointestinal (GI) clinic the following day.



**Figure 1: Riedel lobe demonstrated on abdominal radiograph is functional anatomic extension of the right lobe beyond the inferior costal margin that can be palpated during physical exam.**

On exam in the GI clinic, it was observed that her vital signs were normal and she was a well-appearing, lean athlete. Her abdomen was scaphoid and muscular with normal bowel sounds, and no fluid wave, guarding, rebound or distention. Murphy's sign was absent and only mild tenderness present at McBurney's point. Her right upper quadrant was tender on direct palpation and with deep palpation of the left upper quadrant. Her liver edge was palpated 2 finger breadths below the subcostal margin anteriorly and palpable lateral to the iliac crest. Her pain was reproduced by rotation of her trunk. She demonstrated no tenderness in the costophrenic angle. Skin exam revealed no extremity ecchymosis, bruising, or rash, and normal sensation was present.

A complete blood cell count revealed white blood cells  $10.8 \times 10^9/L$  with normal differential; hemoglobin 14.2 g/dL; hematocrit 42.9%; platelets  $374/\mu L$ ; mean

corpuscular volume, 90.6fL; red blood cell distribution width 13.8%; AST 25 U/L; and ALT 13 U/L. Electrolyte panel revealed sodium of 146 mmol/L but was otherwise normal. Urinalysis revealed no abnormalities. An acute abdominal radiographic series at the community hospital demonstrated normal gas patterns, skeletal structures, and colon content. Noted anomalies included a right liver edge that extended to the iliac crest and a spleen larger than a normal adult, measuring 11.1 cm. The adult spleen is enlarged if its length is greater than 10 cm on CT scan. The radiology report of her abdominal film read “Hepatomegaly with possible splenomegaly. Consider ultrasound of the abdomen.” Doppler ultrasonography at the medical center measured the liver 18.5 cm with normal echogenicity and contour, normal intrahepatic vascular waveform and color flow. The gallbladder was normal, with a 2 mm duct and the pancreas was showed no abnormalities. The spleen had normal vascular flow and measured 11.1 cm. There were no other abdominal findings.



**Figure 2: Riedel lobe seen superiorly, noted on ultrasound to extend beyond the inferior pole of the right kidney, seen centrally. The liver measured 18.5 cm in its longest dimension. Extension beyond the protection of the thoracic cage increases risk of injury due to blunt trauma iatrogenic injury and lobar torsion.**

## DISCUSSION

The abdominal exam with elongated palpable liver edge prompted further investigation. The goal was to develop a differential for new onset sharp right upper quadrant abdominal pain in an otherwise healthy, athletic teenager responsive to ibuprofen and ice. Labs were normal. Imaging was read as “hepatosplenomegaly” in the context of right upper quadrant pain. These findings in a young reproductive age female prompt a lengthy differential diagnosis including mononucleosis, viral hepatitis, Fitz-Hugh Curtis syndrome, sexually transmitted infections, myelofibrosis, systemic lupus erythematosus, lymphoma, and sarcoidosis, among others. However, when the imaging was reviewed by a pediatric radiologist, the spleen was measured as 11.1

cm, within normal limits for her age. With this in mind, hepatomegaly alone in the context of right upper quadrant pain could indicate hepatitis, leukemia, lymphoma, or sexually transmitted infections. In this case, before further testing was initiated, the pediatric radiologist narrowed the differential and explained the patient's "hepatomegaly". "The liver is completely normal in structure and size. This is a Riedel lobe; the right lobe of the liver is enlarged and totally functional." Riedel lobe is a variation of normal, so where is the pain coming from?

With only normal findings from radiology the differential changes considerably and a return to her recent history and physical exam was performed to clarify the details. What was she doing the night before? Playing keep away and wrestling with her friends. The patient is a well-appearing athlete with complaints of a sharp pain in her right upper abdomen. Her vitals and labs are normal. Mindful repeat of the musculoskeletal exam demonstrated that the pain is reproduced with flexion and extension of the right upper abdominus rectus muscle, rather than elucidation of visceral pain, which would indicate pain related to the abdominal organs, in this case, the liver.

Assessment and plan - The patient likely has strained an abdominal muscle and will recover with relative rest, ice, and ibuprofen in 3-6 weeks. The workup for this patient had the potential to become more extensive. This case is a reminder to review anatomical deviations from normal and consider the possibility of more benign causes of presenting symptoms.

### Diagnosis

Riedel lobe has an undetermined etiology.<sup>1</sup> It is an extension of the right lobe of the liver in a 'tongue-like' projection below the umbilicus.<sup>4</sup> It has an incidence of 3-30%, increasing with age; it is seen in 25% of 20-45 year-olds and about 60% of 45-65 year-olds, with a higher incidence in women.<sup>4</sup> Riedel lobe is an anatomical variation of normal that may be clinically confused with an abdominal mass.<sup>1</sup> Potential morbidities for patients with a Riedel lobe include lobar torsion, obstruction due to mass effect, and interference with laparoscopic surgical procedures.<sup>2</sup>

When assessing pediatric patients, particular care should be given when considering radiographic examinations involving ionizing radiation as children are more radiosensitive than adults.<sup>4,5</sup> Efforts should be made to keep the dose as low as reasonably achievable (ALARA) while still obtaining the information necessary to obtain a diagnosis.<sup>4,5</sup> Variations of normal must be considered when workup is initiated prior to subjecting patients to tests or imaging which may be unnecessary and potentially harmful.

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