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Unveiling the unusual: Incidental identification of Riedel's Lobe in female with systemic lupus erythematosus

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Abstract
Riedel's lobe is a rare anatomical variant characterized by a downward extension of the right lobe of the liver, presenting diagnostic challenges due to its potential to mimic hepatic masses and variable incidence. This case report explores the incidental discovery and clinical implications of Riedel's lobe in a young female with a past medical history of systemic lupus erythematosus (SLE), endometriosis, mitral valve prolapse, and lumbar disc herniations, who presented with abdominopelvic discomfort and fatigue. Following her initial presentation, a urinalysis that revealed the presence of red blood cells (RBCs) prompted a contrast-enhanced computed tomography (CT) scan of the abdomen and pelvis, incidentally, uncovering a Riedel's lobe. Despite the absence of a direct correlation between the identified anatomical variant and the patient's presenting symptoms, its discovery highlights the importance and challenges of recognizing such variations during diagnostic imaging to avoid misdiagnosis of pathologic hepatomegaly or malignancy.

Keywords: Riedel's Lobe, anatomical variant, right liver lobe extension, hepatic mass mimicry, diagnostic challenges, systemic lupus erythematosus (SLE)

Introduction
Riedel's lobe represents a rare anatomical anomaly, distinguished by a distinctive downward extension resembling a tongue from the right lobe of the liver. Classified as a form of accessory liver lobe, its pathogenesis is thought to stem from either excessive congenital development, resulting in hypertrophy of segments V (located between the middle and right hepatic veins) and VI (located to the right of the right hepatic vein), or acquired through intraperitoneal or intrapelvic inflammation in predisposed individuals [1]. Initially identified by German surgeon Bernhard Moritz Carl Ludwig Riedel following observation of palpable masses in the right hypochondrium of seven surgical female patients [2], this entity typically evades clinical detection, often emerging incidentally during abdominal imaging conducted for unrelated reasons due to its asymptomatic and uncomplicated nature.
Prevalence of Riedel's lobe fluctuates between 3.3% and 31% [3], likely due to disparate diagnostic criteria and methodologies. The emergence of symptoms, when present, manifests as abdominal discomfort, tenderness, nausea, bloating, constipation, or distention [3], primarily attributable to the elongation of the lobe or compression of adjacent structures such as abdominal vasculature, stomach, or kidneys [2]. Its resemblance to hepatomegaly further complicates diagnostic clarity, highlighting the necessity for increased awareness of Riedel's lobe, the most common form of accessory lobes [4], to preempt misdiagnosis and inappropriate treatment.
Confirmation of suspected Riedel's lobe typically relies on imaging modalities such as ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI) [4], while acknowledging its potential association with malignancy, as documented in several cases [1, 3]. This case report emphasizes the importance of diagnostic imaging in recognizing anatomic anomalies to ensure accurate diagnosis and prevent unnecessary interventions.

Case Presentation
A 25-year-old Caucasian female presented to the clinic with complaints of abdominopelvic discomfort and fatigue. Her medical history was significant for systemic lupus erythematosus (SLE), endometriosis, mitral valve prolapse, and chronic lumbar disc herniations. The patient's daily medications included hydroxychloroquine for SLE, baby aspirin for

Raynaud's phenomenon, and norethindrone for endometriosis. Prior to this visit, the patient had sought care at an urgent care facility due to abdominopelvic pain and blood in her urine. Following a urinalysis performed there, which showed the presence of red blood cells (RBCs) without accompanying protein, nitrites, or leukocyte esterase, the patient was prescribed nitrofurantoin, an antibiotic, despite the absence of typical signs of urinary tract infection. At urgent care, a urine beta human chorionic gonadotropin (beta-hCG) was negative. The patient was advised to withhold aspirin until following up with her primary care physician. Upon subsequent evaluation by her primary care physician, a repeat urinalysis revealed persistent RBCs but no other abnormalities, alongside the ongoing abdominopelvic pain. A urine culture and sensitivity test showed no growth indicating there was no presence of urinary tract infection. An ultrasound was ordered which revealed bilateral hydronephrosis, without evidence of stones or obstructions. This prompted further investigation with a computed tomography (CT) with and without contrast of the abdomen and pelvis [Figures 1-3], complete blood count (CBC) and comprehensive metabolic panel (CMP).

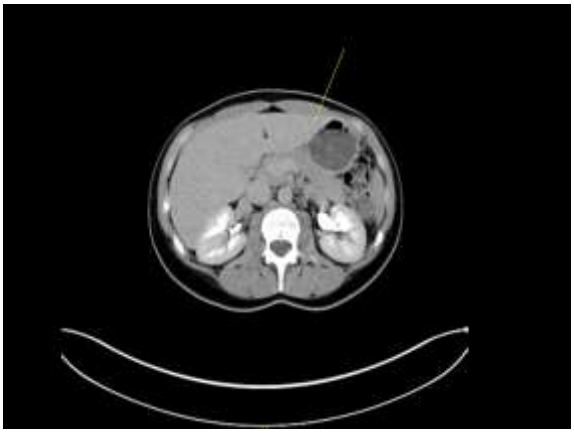

Fig 1: CT Abdomen/Pelvis with and W/O Contrast IVP Delay Axial View. The yellow arrow illustrates the Riedel lobe anomaly in an axial view.

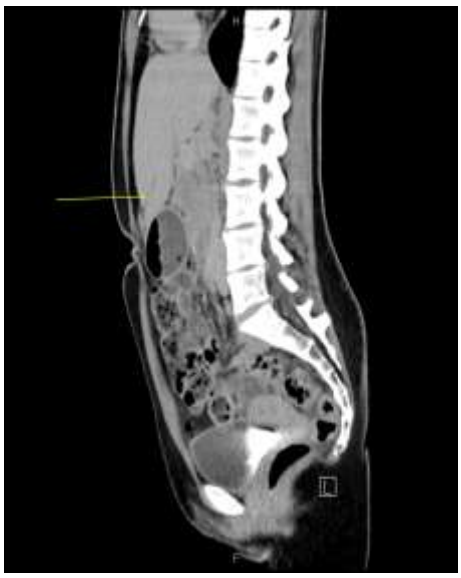

Fig 2: CT Abdomen/Pelvis with and W/O Contrast IVP Delay Sagittal View. The yellow arrow highlights the elongated nature of Riedel's lobe on sagittal view.

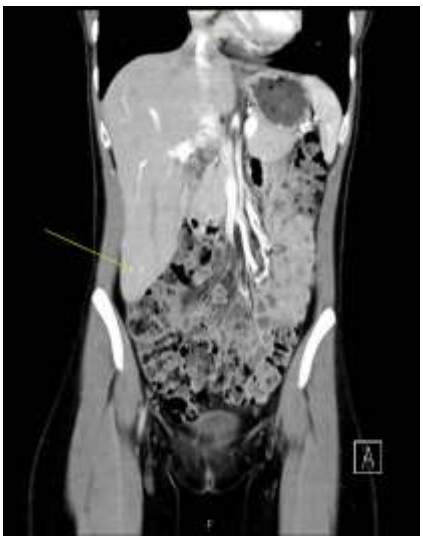

Fig 3: CT Abdomen/Pelvis with and W/O Contrast IVP Delay Coronal View. Yellow arrow points to tongue-like projection of Riedel's lobe best visualized with coronal view.

Despite being a follow-up, ANA testing was repeated and returned positive, along with mildly elevated ESR and CRP indicating potential inflammation [Table 1]. All values of the CBC and CMP were within the normal reference range [Table 1]. Additionally, laboratory results for uric acid levels were within normal limits making a kidney stone unlikely. At this point, the concern was for a potential lupus flare-up. Pancreatitis was ruled out because there was no vomiting or back pain, and the pain was localized to the lower abdomen and pelvis. Additionally, enlargement of the pancreas or heterogeneous enhancement was not appreciated on imaging. Therefore, no amylase or lipase tests were conducted. Hydroxychloroquine side effects were not considered due to the patient's prolonged use over 3.5 years. The patient was not evaluated for anti-phospholipid (APL) syndrome due to no history of attempted pregnancies, miscarriages, or blood clots. Additionally, the patient is on a progesterone-only pill for endometriosis due to the higher risk of clotting in SLE patients [5]; although APL was not confirmed, precautionary measures were taken by her

physicians. Although the CT scan [Figures 1-3] did not show any masses or obstructions, it did reveal an incidental finding of Riedel's lobe, which was not initially attributed to the patient's symptoms.

Table 1: Comprehensive metabolic panel (CMP) and complete blood count (CBC) laboratory results with reference range.

Test	Result	Reference Range
Glucose	76 mg/dL	70 – 100 mg/dL
Creatinine	0.77 mg/dL	0.5-1.2 mg/dL
Urea Nitrogen (BUN)	11 mg/dL	7-20 mg/dL
Glomerular Filtration Rate	110 mL/min/1.73m²	≥ 90 mL/min/1.73m²
Sodium	137 mmol/L	135-145 mmol/L
Potassium	4.6 mmol/L	3.5-5.1 mmol/L
Chloride	104 mmol/L	98-107 mmol/L
Carbon Dioxide	26 mmol/L	22-29 mmol/L
Calcium	9.6 mg/dL	8.6-10.3 mg/dL
AST (Aspartate Aminotransferase)	11 U/L	10-40 U/L
ALT (Alanine Aminotransferase)	7 U/L	7-56 U/L
White Blood Cell Count (WBC)	4.6 thousands/uL	4.0-10.5 thousands/uL
Red Blood Cell Count (RBC)	4.74 million/uL	4.2-5.4 million/uL
Hemoglobin	13.5 g/dL	12-16 g/dL
Hematocrit	40.2%	37-47%
Mean Corpuscular Volume (MCV)	84.8 fL	80-100 fL
Platelet Count	280 mcL	150-400 mcL
Absolute Neutrophil Count	2,019 cells/uL	1,800-7,800 cells/uL
Absolute Lymphocyte Count	2,217 cells/uL	1,000-4,800 cells/uL
Absolute Eosinophil Count	60 cells/uL	15-500 cells/uL
Erythrocyte Sedimentation Rate (ESR)	23 mm/hr	0-20 mm/hr
C-Reactive Protein (CRP)	1.2 mg/dL	0.3-1.0 mg/dL
Uric Acid	3.8 mg/dL	3.5-7.2 mg/dL

The patient was treated with methylprednisolone and showed improvement. Patient was advised to continue her medication regimen of hydroxychloroquine, baby aspirin, and norethindrone acetate to manage her chronic conditions in addition to following up with a urologist. As the patient reported improvement in symptoms after completing her steroid pack, she declined a cystoscopy recommended by the urology team. Overall, in this patient's case, Riedel's lobe was an incidental finding on imaging and not the primary cause of her abdominopelvic symptoms or fatigue. At this time, the patient does not require any intervention for Riedel's lobe.

Discussion

Riedel's lobe is often identified incidentally to the patient's primary clinical concerns which emphasizes the importance of detailed anatomical assessment during diagnostic imaging [2, 6-7]. Despite its benign nature, Riedel's lobe can introduce diagnostic complexities due to its potential to mimic hepatic pathology [2]. This highlights the necessity for clinicians to exercise vigilance in differentiating it from true liver lesions to avoid unwarranted interventions and ensure appropriate patient management.

The etiology of Riedel's lobe remains enigmatic, with proposed hypotheses ranging from congenital predisposition to acquired elongation secondary to inflammatory processes [8]. Riedel believed that inflammation from neighboring structures, such as the gallbladder and appendix, could exert traction on the liver, leading to its elongation [8-9]. While Riedel's lobe is usually asymptomatic, complications such as torsion or extrinsic compression require surgical intervention [9]. For symptomatic cases, non surgical intervention such as analgesics are the primary modality [10].

Anatomically, Riedel's lobe is typically demarcated from the liver by a transverse narrowing of the hepatic parenchyma, however it can also be attached to the liver by a wide fibrous sulcus [9]. This condition, known as a pedunculated lobe, is at risk for torsion and may require surgical intervention. Other complications include gastric outlet obstruction induced by Riedel's lobe, which may require surgical interventions such as laparotomy and cholecystectomy [11]. Furthermore, its association with conditions like hydatid cysts and primary or metastatic cancers adds complexity to its clinical ramifications [1]. Chronic inflammation, purportedly underlying Riedel's lobe, may heighten the risk of hepatic malignancies and warrants further investigation [1, 8].

In this presented case, the patient's chief medical concerns centered on a systemic lupus erythematosus (SLE) exacerbation, with the discovery of Riedel's lobe incidental to the diagnostic process. The management strategy prioritized the continuation of the patient's hydroxychloroquine regimen for SLE, supplemented by methylprednisolone to address the exacerbation. This interplay between Riedel's lobe and SLE accentuates the complex nature of clinical presentations, necessitating a comprehensive and nuanced management approach including the identification of Riedel's lobe in diagnostic imaging to delineate it from genuine pathology. While typically asymptomatic, its potential for complications emphasizes the significance of diligent anatomical evaluation. Future research should focus on understanding the underlying etiology and association with hepatic

malignancies to further enhance clinical interventions and optimize patient care.

Conclusions

Although Riedel's lobe is often asymptomatic, it can complicate the diagnostic process by mimicking more serious hepatic pathologies, such as hepatic masses. Clinicians should be aware of this anatomical variant, particularly when evaluating patients with abdominal symptoms. In this case, the patient's management focused on addressing the underlying SLE exacerbation, highlighting the importance of a comprehensive clinical approach in the context of incidental findings. Continued research and reporting of such cases contribute to a better understanding of the clinical implications of Riedel's lobe and guide appropriate patient management.

Conflict of Interest

Not available

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Not available

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