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Unveiling the Beaver Tail Liver: A Hepatic Variant with Diagnostic Significance

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A 26-year-old woman presented to the Outpatient Department (OPD) with the complaints of persistent fatigue, progressive dyspnoea on exertion, generalised weakness, and recent worsening of vision. She had a known history of dimorphic anaemia {Haemoglobin (Hb) 10.3 gm/dL} and poorly controlled type 2 diabetes mellitus {Glycosylated Haemoglobin (HbA1c) - 7.3}. On physical examination, she appeared pale, with bilateral pedal oedema and mild hepatomegaly. Her random blood glucose was markedly elevated, and fundoscopic examination revealed early signs of diabetic retinopathy.

Given her rapidly deteriorating glycaemic control despite ongoing treatment, a detailed laboratory workup was advised to identify possible underlying causes or atypical presentations of diabetes. The tests included Fasting Blood Sugar (FBS), Postprandial Blood Sugar (PPBS), HbA1c, serum C-peptide, and anti-GAD65 antibodies to assess for latent autoimmune diabetes or pancreatic beta-cell dysfunction.

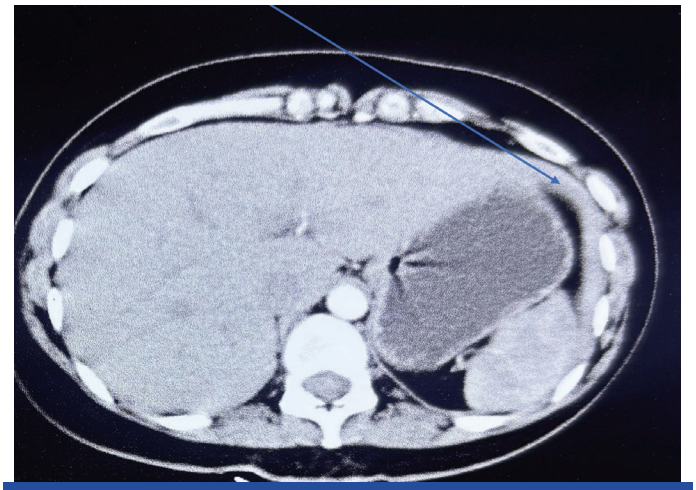
In addition, due to her vague abdominal discomfort, anaemia of unclear etiology, and suspicion of possible pancreatic involvement (including calcification or structural lesions), an abdominal and pelvic Contrast-Enhanced Computed Tomography (CECT) scan was performed. Although imaging for diabetes evaluation is not a standard practice, in this case it was considered due to the constellation of systemic symptoms, failure to respond to conventional therapy, and a clinical suspicion of an atypical or secondary cause of diabetes.

Imaging Findings

CECT revealed an incidental finding of a prominently elongated left hepatic lobe extending laterally to encase the spleen, consistent with the anatomical variant known as beaver tail liver. The measured extension was approximately 13.1 cm beyond the midline. No focal hepatic lesion, calcification, or evidence of pancreatitis was noted. Liver size, shape, and enhancement pattern were otherwise normal. There was no evidence of extra- or intrahepatic biliary dilatation. Other abdominal organs including the gall bladder, pancreas, spleen, kidneys, bowel, uterus, and adnexa appeared normal. No lymphadenopathy or free fluid was observed. The bladder was empty, and the visualized skeleton and thorax showed no abnormalities.

Important Findings (CECT Abdomen and Pelvis)

The CECT abdomen and pelvis revealed a Beaver's tail variant of the liver with the left lobe measuring 13.1 cm; the liver was otherwise normal in size, shape, and enhancement with no evidence of intrahepatic or extrahepatic biliary dilatation. The portal vein, intrahepatic Inferior Vena Cava (IVC), and hepatic veins were unremarkable. The gallbladder showed normal wall thickness with no calculi, and the pancreas appeared normal. The stomach was well-defined without wall thickening and maintained clear fat planes with the pancreas. The spleen was normal in size, shape, and enhancement, with a normal splenorenal ligament. Both kidneys were normal in size and configuration with no evidence of calculi or pelvicalyceal dilatation. The bowel appeared normal, the urinary bladder was empty, and the uterus, adnexa, and bilateral ovaries were normal in size, shape, and appearance [Table/Fig-1].



[Table/Fig-1]: CECT report of abdomen and pelvis showing Beaver's Tail variant of the liver.

Other Observations:

- No free fluid in the abdomen.
- No abdominal lymphadenopathy.
- Visualised skeleton and lower thorax were normal.

Overall Impression

- Beaver tail liver (elongated left hepatic lobe measuring 13.1 cm) [1,2].
- No other abdominal or pelvic abnormalities detected.

Differential Diagnosis

An elongated left hepatic lobe adjacent to the spleen may suggest the following possibilities:

- **Splenomegaly** – Spleen enlargement may appear similar on imaging but shows different enhancement patterns and vascular markings [3].
- **Compensatory hypertrophy of liver segments** – Seen in cirrhosis or post-resection.
- **Perisplenic haematoma** – Typically presents as a hypodense area post-trauma and lacks vascularity [4].
- **Accessory or lobulated spleen** – Congenital nodules of splenic tissue may mimic hepatic extension [3].
- **Residual or regenerating splenic tissue** – Possible post-splenectomy or splenic injury.
- **Splenic tumors/cysts** – Can displace splenic architecture, mimicking adjacent hepatic tissue.
- **Ectopic liver tissue** – May appear as a pedunculated or detached mass adjacent to the spleen [4].

Management and Follow-up

No specific treatment was required for the anatomical variant. The patient was managed conservatively for her primary complaint of uncontrolled diabetes. She was referred to an endocrinologist for optimisation of her antidiabetic therapy and was scheduled for routine follow-up to monitor blood glucose control and haemoglobin levels.

Clinical Relevance

Beaver tail liver is a rare congenital morphological variation where the left hepatic lobe extends laterally and may encase or about the spleen [1,4,5]. Although usually asymptomatic, it is clinically relevant as it may mimic splenic trauma or pathology on imaging—especially in emergency settings due to similar attenuation of hepatic and splenic tissue [1,2,4,5]. In this patient, the variant was an incidental finding during the workup for uncontrolled diabetes and anaemia. Its detection helped rule out other pathological causes such as pancreatic masses, chronic pancreatitis, or infiltrative lesions potentially contributing to secondary diabetes [2,5].

Prevalence data is scarce, but reviews and case series suggest this variant's prevalence may be up to 5% in adults, mostly found incidentally [1,6]. Most cases are in adults, but paediatric case reports exist [7].

Epidemiological Pointers

- Appears more common in females, possibly due to anatomical differences [1].
- Most cases are discovered incidentally during imaging for unrelated reasons (pain, trauma, other non-hepatic complaints [7,8].
- No clear evidence of regional or ethnic predisposition [1].

Clinical Implications

- High risk of misdiagnosis as splenic injury during trauma, affecting acute management [1,2,4]. Knowledge of this variant prevents error in hepatic/splenic surgery and interpretation of imaging [1,2,4,5]. In liver transplantation, increased left lobe volume may benefit donor selection [9]. Awareness aids in diagnostic confidence and interventional planning [10]. It is important to recognise this role in ultrasonography and trauma settings [5,10]. A similar case highlighted in Kapoor S et al., showed this variant mimicking a perisplenic haematoma [2].

Literature Examples

Numerous case reports detail diagnostic challenges with this variant, particularly in trauma or emergency settings:

- A 67-year-old male was found to have a suspicious lesion on CT angiography ultimately diagnosed as a beaver tail liver, demonstrating potential for misinterpretation [6].
- Another case presented as an extraluminal mass compressing the gastric fundus during EGD, initially mistaken for a mass lesion, but was found to be this variant [11].
- Cadaveric studies have found instances where the elongated left lobe completely/partially encircled the spleen, mimicking perisplenic haematoma—critical in trauma assessment [4,12].
- Another case involved a patient with abdominal pain, haematuria, and fever, where the beaver tail variant encircled the spleen and could have been mistaken for injury [13].
- Pediatric and young adult reports exist, including instances where the elongated lobe cast shadows on chest X-ray, risking misdiagnosis if not correlated with CT/MRI [7,14].
- These emphasize the need for close clinico-radiologic correlation, tools like color Doppler to differentiate tissue, and heightened vigilance in trauma assessments to avoid unnecessary or missed interventions [10].

REFERENCES

[1] Khanduri S, Malik S, Khan N, Singh H, Rehman M. Beaver tail liver: A hepatic morphology variant. Cureus. 2021 Jul 12;13(7):e16379. doi:10.7759/cureus.16379.
[2] Kapoor S, Williams T, Ea M, Biglione A, Williams TB. Beaver tail liver: A rare anatomic variant. Cureus. 2023 Sep 2;15(9):e43851. doi:10.7759/cureus.43851.
[3] Mortelé KJ, Segatto E, Ros PR. The accessory spleen: CT and MR imaging features. AJR Am J Roentgenol. 2004;183(6):1653-1657. doi:10.2214/ajr.183.6.01831653.
[4] Arkoudis NA, Stamelos K, Tsochatzis A, Moschovaki-Zeiger O, Spiliopoulos S. Hiding beaver tail liver: A rare case report of a beaver tail liver lookalike variant located medially to the spleen, mimicking a perisplenic hematoma. Egypt J Radiol Nucl Med. 2022;53(1):148. doi:10.1186/s43055-022-00769-4.
[5] Zheng Z, Liu C. A case of ultrasound-guided intervention therapy for a beaver tail liver with hepatic abscess. Yangtze Med. 2023;7(4):191-196.
[6] National Center for Biotechnology Information (NCBI). PMC10545134 [Internet]. Bethesda (MD): National Library of Medicine; [cited 2025 Jul 28]. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC10545134/
[7] Scientific Research Publishing (SCIRP). Paper information: 129871 [Internet]. Wuhan: SCIRP; [cited 2025 Jul 28]. Available from: https://www.scirp.org/journal/paperinformation?paperid=129871
[8] Elsevier. ScienceDirect article S1930043322007968 [Internet]. Amsterdam: Elsevier; [cited 2025 Jul 28]. Available from: https://www.sciencedirect.com/science/article/pii/S1930043322007968
[9] National Library of Medicine (US). PubMed PMID: 37789993 [Internet]. Bethesda (MD): NLM; [cited 2025 Jul 28]. Available from: https://pubmed.ncbi.nlm.nih.gov/37789993/
[10] Radiopaedia. Beaver tail liver [Internet]. Melbourne: Radiopaedia; [cited 2025 Jul 28]. Available from: https://radiopaedia.org/articles/beaver-tail-liver
[11] Cureus Inc. Beaver tail liver: A rare anatomic variant [Internet]. Palo Alto (CA): Cureus Inc.; [cited 2025 Jul 28]. Available from: https://www.cureus.com/posters/2492-beaver-tail-liver-a-rare-anatomic-variant
[12] National Center for Biotechnology Information (NCBI). PMC7929591 [Internet]. Bethesda (MD): National Library of Medicine; [cited 2025 Jul 28]. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7929591/

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