



Bare area sign

Venkatraman Indiran^{1,2} · Jagannathan Kokilavani³

Published online: 9 April 2019
© Springer Science+Business Media, LLC, part of Springer Nature 2019

The posterosuperior aspect of the liver, adjacent to the posterior body wall, is not covered by peritoneum, resulting in the so-called “bare area” [1]. It is a large triangular area on the diaphragmatic surface of the liver which is attached directly to the diaphragm by loose connective tissue (Figs. 1, 2). As the bare area is devoid of peritoneum and due to the restriction of peritoneal fluid by the coronary ligaments, fluid at

that site cannot be ascites, but only pleural effusion. This is called as the bare area sign (Fig. 3) [2]. Halvorsen et al., in their blinded analysis of multiple cases, concluded that no single sign was reliable, but, when all four signs (the diaphragm sign, the displaced crus sign, the interface sign, and the bare area sign) were used, accurate differentiation of ascites and pleural effusion was possible [3]. CT sections at

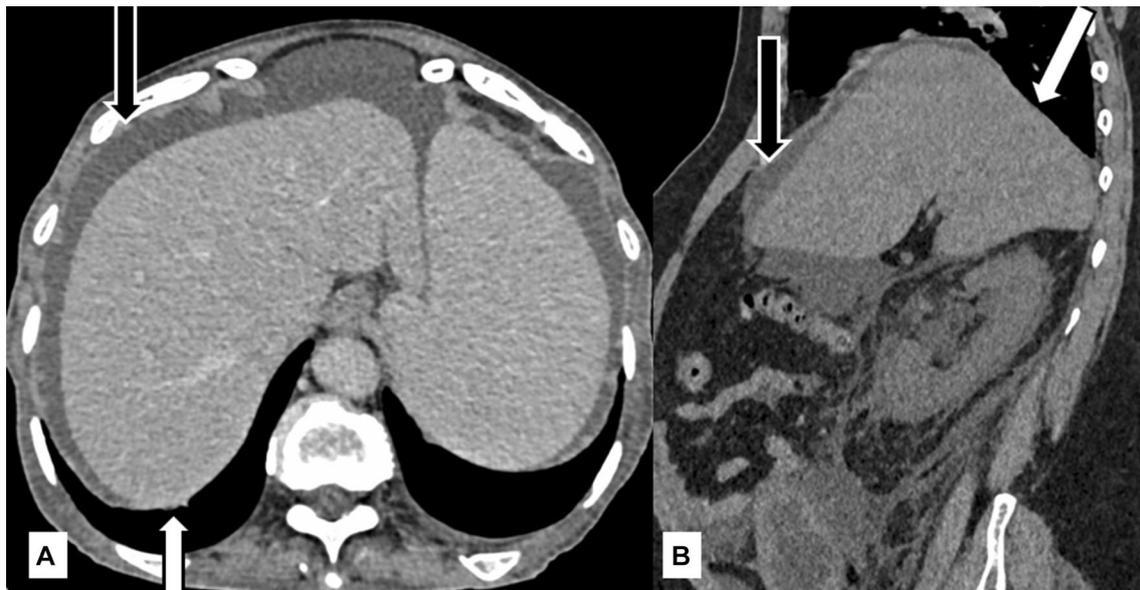


Fig. 1 Axial contrast-enhanced CT section (a) and sagittal reformat (b) show the bare area of liver abutting the diaphragm (white arrows) and ascites (black arrows) which does not cover the bare area

✉ Venkatraman Indiran
ivraman31@gmail.com

¹ Department of Radiodiagnosis, Sree Balaji Medical College and Hospital, 7 Works Road, Chromepet, Chennai, Tamilnadu 600044, India

² IVR Scans, 1, Nellipet Cross Street, Chromepet, Chennai, Tamilnadu 600044, India

³ VK Clinic, Chromepet, Chennai, Tamilnadu 600044, India



Fig. 2 Photograph showing Patomskiy crater, a peculiar rock formation located in a remote area in the Irkutsk region of southeastern Siberia. Source https://upload.wikimedia.org/wikipedia/commons/d/da/Patomsky_crater.jpg



Fig. 3 Axial contrast-enhanced CT section shows the right pleural effusion (black arrows) which is seen along the posterior aspect of the bare area of liver and also posterior to the diaphragm (Curved arrow). White arrow represents the ascites which does not cover the bare area

levels above or below the bare area may cause false-positive diagnosis of ascites. Difficulty may also arise when the bare area is smaller as an anatomical variant [2]. Bare area sign is not valid in patients with liver transplantation, owing to the surgical removal of the normal peritoneal reflections [4].

Author contributions All authors contributed equally in the collection of data, interpretation of the data, and preparation of manuscript.

Funding There is no funding.

Compliance with ethical standards

Conflict of interest Author declares that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the author(s).

Informed consent Informed consent was obtained from individual participant included in the study.

References

1. Kennedy PA, Madding GF. (1977) Surgical anatomy of the liver. *Surg Clin North Am.*;57(2):233-244.
2. Halvorsen RA, Fedyshin PJ, Korobkin M, Foster WL Jr, Thompson WM. (1986) Ascites or pleural effusion? CT differentiation: four useful criteria. *Radiographics.*;6(1):135-149.
3. Halvorsen RA, Fedyshin PJ, Korobkin M, Thompson WM. (1986) CT differentiation of pleural effusion from ascites. An evaluation of four signs using blinded analysis of 52 cases. *Invest Radiol.*; 21:391-395.
4. Crossin JD, Muradali D, Wilson SR. (2003) US of liver transplants: normal and abnormal. *Radiographics* ;23(5):1093-1114.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.