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Case Report

Vicarious Excretion of Intravenous Contrast via Gall Bladder

Arnav Shandil[1] and Nikita Verma[2]*

[1]*Radiologist, Department of Radiology, Civil Hospital Theog, Shimla, India*

[2]*Senior Resident, Department of Radiology, Dr RPGMC Kangra at Tanda, India*

***Corresponding Author:** Nikita Verma, Senior Resident, Department of Radiology, Dr RPGMC Kangra at Tanda, Himachal Pradesh, India.

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Abstract

Vicarious excretion of a contrast medium refers to the excretion of the contrast medium from a route other than the normally expected. Intravenous contrast is mainly excreted via kidneys. Alternative routes include biliary tract, gastrointestinal tract and into ascitic fluid. We present a case showing vicarious excretion of intravenous contrast into the gall bladder. Purpose of this article is to show the imaging appearance of vicarious excretion and to understand its mechanism.

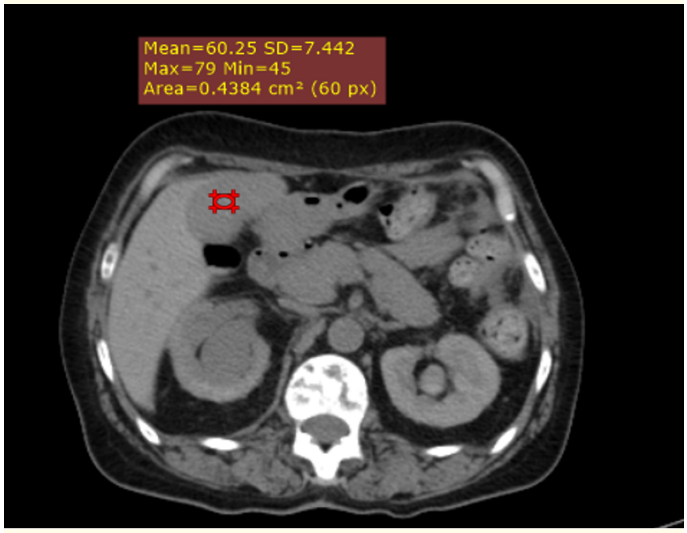
Keywords: Vicarious Excretion; Intravenous Contrast

Introduction

The term "vicarious excretion" of a contrast medium (VECM) refers to the excretion of the contrast medium from a route other than the normally expected. Intravenous contrast is mainly excreted via kidneys. Alternative routes include biliary tract, gastrointestinal tract and into ascitic fluid. Vicarious contrast excretion has been reported to occur in the opposite direction, whereby iodinated contrast introduced into the gastrointestinal tract is absorbed and renally excreted. We present a case showing vicarious excretion of intravenous contrast into the gall bladder.

Case Presentation

A 60 years old female, operated case of carcinoma breast underwent CT thorax which revealed metastatic retroperitoneal lymphadenopathy in the scanned upper abdomen. So, the next day she underwent CT abdomen to know the extent of metastatic lymphadenopathy. In the examination done next day, note was made of hyperdense contents (CT attenuation 60 HU) in the lumen of gall bladder which were not seen in the scan done on previous day (CT attenuation 12 HU). Renal function was within normal limits with serum creatinine value of 1.1 mg/dL.



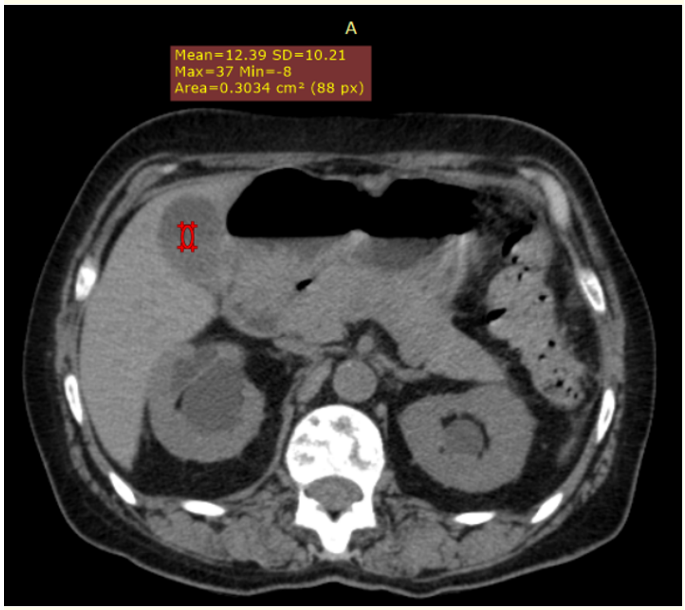


Figure 1: (a) Axial CT section showing fluid attenuation (12 HU) contents in gall bladder. (b) Axial CT section done next day, shows hyperdense contents in gall bladder (60 HU). Note sclerotic vertebral metastasis from carcinoma breast and right hydronephrosis caused by retroperitoneal lymphadenopathy (not shown here).

Discussion

The term "vicarious excretion" of a contrast medium (VECM) refers to the excretion of the contrast medium from a route other than the normally expected. In general, intravenous contrast media are mainly excreted by the renal glomeruli. However, 1.5% - 2% of dose can be excreted by alternative routes including biliary tract, gastrointestinal tract and glandular epithelium [1]. It is far more commonly seen in those with renal impairment but has been reported as a normal variant [2].

The exact mechanism of the vicarious excretion is not completely understood. Some investigators believe that the acidosis associated with renal failure may cause increased protein binding of contrast material and subsequent liver excretion [3]. Others believe that decreased renal clearance of contrast material results in abnormally elevated and prolonged plasma levels of contrast material which result in increased liver excretion. There is further evidence to support the latter mechanism. Gallbladder opacification from vicarious excretion of contrast material has been reported in patients with normal renal function with unilateral ureteral obstruction [4,5]. Ford., *et al*. proposed that vicarious excretion in patients with normal renal function was related to higher dose of contrast material [6].

Derived from the Latin word for 'substitute'-vicarious contrast excretion has been reported to occur in the opposite direction, whereby iodinated contrast introduced into the gastrointestinal tract is absorbed and renally excreted [7].

Conclusion

Vicarious excretion of a contrast medium refers to the excretion of the contrast medium from a route other than the normally expected. Every radiologist must be familiar with the concept of vicarious excretion of intravenous contrast and also of the fact that the oral contrast can be absorbed and excreted via kidneys. It is commonly seen in patients with renal impairment but can also be seen as a normal variant.

Conflict of Interests

The author(s) declare(s) that there is no conflict of interest.

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