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CASE REPORT

Primary mesenteric hydatid cyst as the cause of hypofunctioning kidney in [^{99m}Tc]Tc-DMSA scintigraphy: Background photopenia can reveal critical findings

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ABSTRACT

This case report involves a 67-year-old woman with a 20-year history of primary mesenteric hydatid cyst (PMHD) who presented with recent right flank pain. An abdominopelvic CT scan showed severe right-sided hydroureteronephrosis caused by a large mesenteric cyst compressing the ureter. A [^{99m}Tc]Tc-DMSA scan revealed significant function loss in the right kidney, with a barely visible photopenic area in the mid-abdomen corresponding to the cyst. This case underscores the importance of careful evaluation of scintigraphic images, as overlooked photopenic zones can offer valuable insights into underlying conditions like PMHD, which can lead to renal dysfunction.

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INTRODUCTION

Hydatid disease is a parasitic infection caused by Echinococcus granulosus, with humans serving as incidental intermediate hosts. The liver is the most affected organ, but the disease can involve various sites, including the spleen, kidneys, pancreas, brain, ovaries, mesentery, vertebrae, and soft tissues of the neck. Intraperitoneal hydatid cysts usually result from a ruptured primary hepatic cyst. Primary mesenteric hydatid cysts are extremely rare. In this report we present a 67-year-old patient with a primary mesenteric hydatid cyst presented with a mid-abdominal photopenic area on [^{99m}Tc]Tc-DMSA scan, leading to renal dysfunction.

CASE PRESENTATION

A 67-year-old woman with a 20-year history of primary mesenteric hydatid cyst (PMHD) and left renal stones presented with new-onset right flank pain that began two weeks prior. An ultrasound examination indicated a small sized right kidney and the presence of a large mesenteric cyst. To further assess the suspected nephrolithiasis, a non-contrast abdominopelvic CT scan was performed (Figure 1A). This revealed decreased parenchymal thickness in the right kidney and severe right hydroureteronephrosis, though no evidence of urinary stones were identified. The CT scan also visualized an enlarged mesenteric hydatid cyst (arrowheads) measuring 115 × 120 mm which was exerting significant compression on the right ureter. A [^{99m}Tc]Tc-DMSA scan was subsequently conducted (Figure 1B) to evaluate right renal function. The scan demonstrated severe global cortical loss, indicating negligible function in the right kidney. Additionally, the scan revealed a significant photopenic area in the mid-abdomen (arrowheads). Subsequent SPECT/CT imaging (Figure 1C) confirmed that this area corresponded to the large mesenteric hydatid cyst which featured a surrounding rim of calcification. The SPECT/CT findings were consistent with the initial diagnostic CT scan (Figure 1A), confirming compression of the ureter along its course.

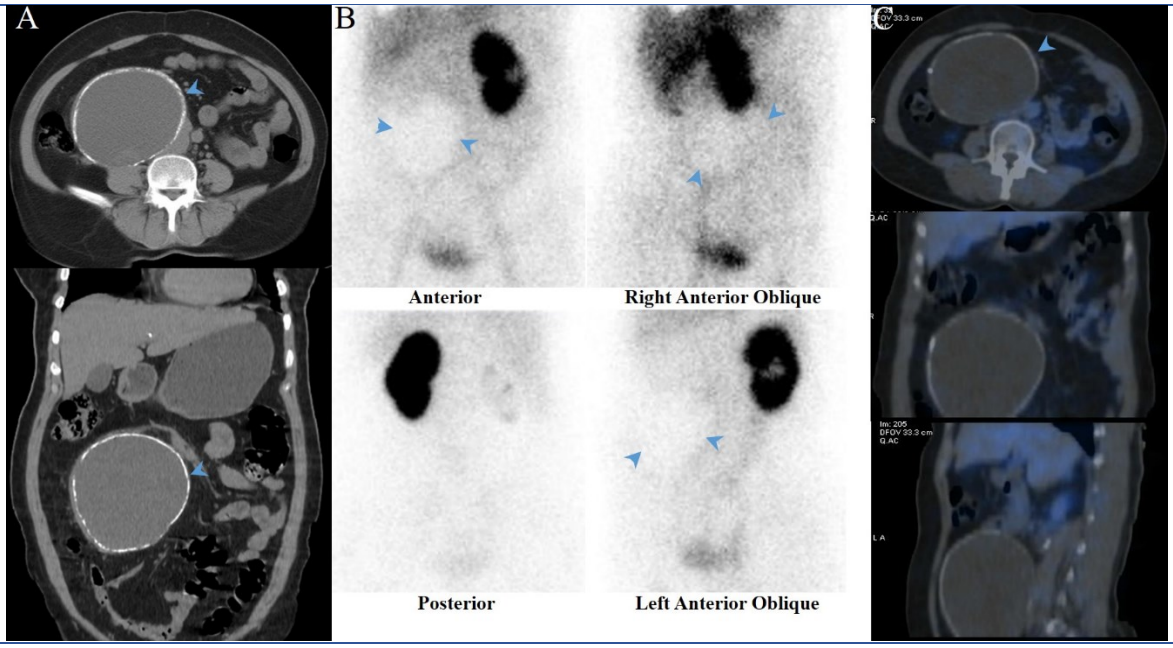

Figure 1. (A) The non-contrast-enhanced CT scan shows an enlarged mesenteric hydatid cyst (arrowheads) exerting compressive effects on the right ureter. (B) The [^{99m}Tc] Tc-DMSA scan reveals a significant photopenic area in the mid-abdomen (arrowheads). Subsequent SPECT/CT imaging (C) confines the photopenic area to the large mesenteric hydatid cyst with a surrounding rim of calcification

DISCUSSION

Most of the time, interpretation of radionuclide imaging primarily focuses on the target organ especially on areas of tracer uptake or accumulation. These areas remain the core of attention even when findings are atypical [1]. Conversely, regions of photopenia in the background are often overlooked or attributed to technical problems in image acquisition [2]. This oversight is particularly common when there is a decrease in uptake rather than a complete absence, which may be attributed to the high accumulation of the tracer in the surrounding tissue and consequently fails to receive adequate attention [3].

[^{99m}Tc]Tc-DMSA scan is commonly employed for the functional and morphological assessment of the renal cortex [4]. In [^{99m}Tc]Tc-DMSA scintigraphy, the primary focus of the reader is typically on the kidneys, often with less attention given to the ureters, bladder morphology, and blood pool activity. However, these additional aspects can provide valuable information, such as diagnosis of a neurogenic bladder or rarely facing the presence of a drooping lily sign aiding in identification of duplicated systems [5]. Although background activity is mostly assessed just to estimate renal function [6], the photopenic zones or altered biodistribution of the tracer may provide golden information, e.g., uncovering a systemic hematologic disorder [7,8]. A significant portion of the imaging field in [^{99m}Tc]Tc-DMSA scintigraphy includes the bowels, colon, mesentery, and peritoneum. While these areas are commonly normal on scans, they may provide important insights into the etiology of decreased renal function, as demonstrated in our case, or unveil additional findings like enterovesical fistula [9] or metastatic lesions [10].

CONCLUSION

The presented case highlights the importance of thorough evaluation of scintigraphic images, particularly in detecting rare conditions like primary mesenteric hydatid disease (PMHD). Careful interpretation of [^{99m}Tc]Tc-DMSA scintigraphy images is crucial, involving gradual adjustment of intensity or color bar settings to detect photopenic zones that may be indicative of underlying pathology and yield more informative insights than areas of increased uptake.

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