

Occult cholecystitis presenting as PUO demonstrated on Gallium

L Ha, R Mansberg, H Van Der Wall, L Emmett, M Magee

Citation

L Ha, R Mansberg, H Van Der Wall, L Emmett, M Magee. *Occult cholecystitis presenting as PUO demonstrated on Gallium*. The Internet Journal of Nuclear Medicine. 2007 Volume 5 Number 1.

Abstract

Gallium-67 scintigraphy is commonly performed to investigate Pyrexia of Unknown Origin (PUO) due to its affinity for infection or inflammation. The dissemination of hybrid SPECT CT imaging allows improved identification and localisation of causes of PUO. A 74 year old male was referred for investigation of pyrexia of unknown origin. Gallium SPECT CT was performed and demonstrated increased Gallium uptake in the gallbladder wall with features of cholelithiasis and collection on the corresponding CT images. At operation the gallbladder revealed areas of chronic cholecystitis and xanthogranulomatous inflammation.

Figure 1

Figure 1: A 74 year old male was referred for investigation of pyrexia of unknown origin. A Gallium scan was performed and a whole body planar and SPECT/CT were acquired up to 48 hours following the administration of 300 MBq of Ga-citrate.

Gallium SPECT (Top Row) and SPECT/CT fused (Middle Row) images demonstrated increased Gallium uptake in the gallbladder wall (solid arrow). CT (Bottom Row) images also revealed pericholecystic fat stranding (arrowhead) and a small collection at the interface between the gallbladder and the liver (solid arrow).

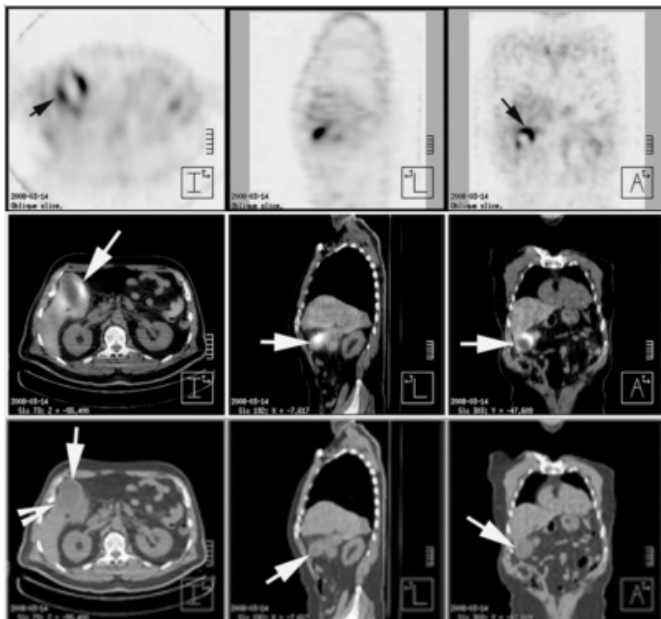
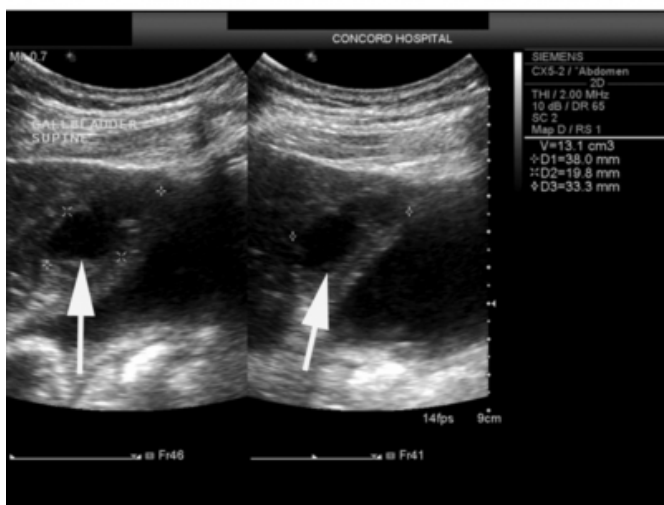
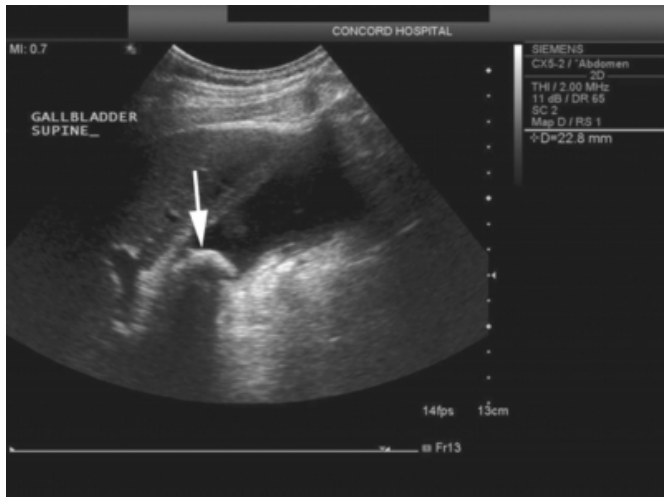


Figure 2

Figure 2: An ultrasound was performed for further evaluation. The US demonstrated a non-mobile calculus (solid arrow) in the gallbladder neck (Top image) and confirmed cholecystitis (Lower image) with a pericholecystic collection (solid arrow). The patient subsequently underwent laparotomy and cholecystectomy. A 39mm diameter gallstone and a haemorrhagic inflamed gallbladder were removed. Histologic examination revealed organising chronic cholecystitis and areas of xanthogranulomatous inflammation.



There are number of causes of PUO including pyogenic infection (soft tissue abscess, pneumonitis, musculoskeletal), non-pyogenic infection (mycobacterial, viral, chronic bacterial, fungal/rickettsial), non-infective inflammation

(sarcoidosis, inflammatory bowel disease, vasculitis, “collagen” disease, organ rejection), and neoplasia (haemoproliferative, renal cell carcinoma, melanoma).^{1,2}

There are a number of proposed mechanisms of ⁶⁷ Ga uptake into pathologic sites including increased vascular permeability to ⁶⁷ Ga-transferrin complex, radiotracer accumulation in expanded regional vascular and interstitial fluid spaces, and binding of the metal-protein complex to extravascular transferrin receptors.^{3,4,5}

Cholecystitis is a relatively common condition usually diagnosed clinically and confirmed by ancillary laboratory investigations and imaging with ultrasound and hepatobiliary scintigraphy.^{6,7,8} The addition of Hybrid SPECT CT to ⁶⁷ Ga scintigraphy improves the sensitivity and specificity of the modality in investigating PUO.

CORRESPONDENCE TO

Dr Robert Mansberg, MB BS FRACP Department of Nuclear Medicine Concord Repatriation General Hospital Concord NSW 2139 Australia Tel (612) 9767 6339 Fax (612) 9767 7451 Email: mansberg@usyd.edu.au

References

1. Weiner RE, Cohen MS, Hoffer PB. Influence of various factors on finding ⁶⁷ Ga to polymorphonuclear leucocytes. *Int J Rad Appl Instrumen B* 1987 14: 523-528
2. Palestro CJ. The current role of gallium imaging in infection. *Semin Nucl Med* 1994 24: 128-141
3. Mouratidis B, Lomas F. The role of gallium-67 scanning in febrile patients. *Australas Radiol.* 1994 Aug;38(3):193-5.
4. Waxman AD, Siemsen JK. Gallium gallbladder scanning in cholecystitis. *J Nucl Med* 1975; 16:148-150
5. Meduri GU, Belenchia JM, Massie JD, Eltorkey M et al. The role of gallium-67 scintigraphy in diagnosing sources of fever in ventilated patients. *Intensive Care Med* 1996 22 : 5 : 395-403
6. Weissmann HS, Frank MS, Bernstein LH, et al. Rapid and accurate diagnosis of acute cholecystitis with ^{99m} Tc-HIDA cholescintigraphy. *AJR* 1979; 523-528.
7. Ralls PW, Colletti PM, Lapin SA, Siemsen JK. Real-time sonography in suspected acute cholecystitis: prospective evaluation of primary and secondary designs. *Radiology* 1985; 155: 767-771
8. Marchal GJF, Caesar M, Baert AL, Goddeeris PG, et al. Gall bladder wall sonolucency in acute cholecystitis. *Radiology* 1985; 156: 797-800

Author Information

Leo Ha, MB BS FRANZCR

Department of Nuclear Medicine, Concord Repatriation General Hospital

Robert Mansberg, MBBS FRACP

Discipline of Imaging, University of Sydney

Hans Van Der Wall, MBBS PhD FRACP

Department of Nuclear Medicine, Concord Repatriation General Hospital

Louise Emmett, MBBS FRACP

Department of Nuclear Medicine, Concord Repatriation General Hospital

Michael Magee, MBBS FRACP

Department of Nuclear Medicine, Concord Repatriation General Hospital