Case 15686

Pyogenic liver abscess and colorectal cancer: an emerging association
Published on 12.05.2018

DOI: 10.1594/EURORAD/CASE.15686
ISSN: 1563-4086
Section: Abdominal imaging
Area of Interest: Liver
Procedure: Diagnostic procedure
Procedure: Drainage
Imaging Technique: CT
Special Focus: Abscess Case Type: Clinical Cases
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Patient: 73 years, female

Clinical History:

A 73-year-old lady suffered from vague abdominal pain, progressive malaise, weight loss and episodes of low-grade since 6 weeks. Her medical history was unremarkable apart from previous hysterectomy for benign disease. Laboratory assays showed moderately raised acute phase reactants. On further questioning, she denied modified bowel habits.

Imaging Findings:

Initially, emergency CT (Fig. 1) showed the presence of a bilobated, internally fluid lesion centered in the 4th liver segment, with peripheral enhancement hypoenhancing adjacent parenchyma, consistent with an abscess. As an additional, incidental finding a marked near-circumferential mural thickening of the caecum was noted. Despite initiation of antibiotics, the liver abscess tended to increase in size, therefore percutaneous CT-guided puncture and drainage positioning (Fig. 2) was performed. Cultures showed polymicrobial infection including Enterobacteria. Repeated CT after drainage (Fig. 3) confirmed effectively treated infection with decreased abscess size and near-complete resolution of internal fluid-like purulent content. After drainage removal, water-enema CT (Fig. 4) showed near-complete regression of the abscess and depicted the solid mural thickening of caecum, consistent with endoscopic and bioptic diagnosis of adenocarcinoma. Pathology from right hemicolecction plus lymphadenectomy (post-surgical status shown in Fig. 5) diagnosed pT3N1 tumour. After adjuvant chemotherapy, the patient did well and is still alive five years later.

Discussion:

Pyogenic liver abscesses (PLAs) may result from cholangitis, ascending infection via portal vein from a variety of abdominal and pelvic conditions, or septic haematogenous dissemination. Solitary PLAs are often cryptogenetic, lacking a clear-cut predisposing disorder. Usual manifestations include fever, right-sided abdominal pain, abnormal liver enzymes and function tests, but PLAs with vague complaints and minimal biochemical changes are not uncommon [1, 2].
In recent years, PLA is increasingly reported as a possible warning sign of underlying, often clinically occult colorectal carcinoma (CRC) and other colonic changes such as laterally-spreading tumours, multiple ulcers and advanced polyps. Among patients with PLA, CRC is encountered with a prevalence ranging from 5.45% to 11%. Most patients are in the seventh decade of life, with a 60% male predominance and strong association with diabetes. After adjusting for age, sex and comorbidities, patients with PLA have a three- to fivefold increased risk of harbouring CRC than controls. Risk is highest within 3 months from occurrence of PLA and remains elevated up to 5 years. The hypothesized pathogenesis involves disruption of mucosal barrier at the site of CRC leading to bacterial translocation into the portal venous system and subsequent haematogenous spread to the liver. Most reports on this emerging association are from Eastern Asia: in these countries Gram-negative bacteria (particularly Klebsiella pneumoniae) predominate, conversely the microbiological spectrum is unevenly distributed in non-Asian patients [3-6].

In conclusion, when faced with an otherwise unexplained PLA radiologists should thoroughly scrutinize the large bowel to avoid missing overt CRC. Either colonoscopy [7] or CT-colonography [8] is warranted to detect an underlying occult CRC, particularly in patients over 60 years of age. The key differential diagnosis of PLA associated with colonic wall thickening is amoebiasis [9].

At cross-sectional imaging, PLAs show the well-known appearance of either solitary well-marginated or complex multiloculated cystic masses. Differentiation from CRC liver metastases should rely on the characteristic “double target” CT sign, in which the internal fluid-like content is surrounded by two concentric rims: the higher-attenuation inner layer represents the pyogenic membrane and shows early contrast uptake that persists in delayed phases; conversely the outer layer represents oedematous adjacent liver parenchyma, appears hypoattenuating in the arterial phase and enhances in delayed acquisitions. Additionally, the characteristic “clustered” appearance refers to multiple small hypoattenuating lesions which tend to coalesce into a larger cavity [1, 2].

Treatment should initially address the PLA using intensive antibiotics and percutaneous drainage of larger collections, then the CRC [3-6].

**Differential Diagnosis List:** Pyogenic liver abscess and associated colon carcinoma, Liver metastases from colon carcinoma, Hydatid disease, Amoebiasis with liver abscess

**Final Diagnosis:** Pyogenic liver abscess and associated colon carcinoma

**References:**


**Description:** A bilobated, internally fluid lesion (*) centered in the 4th liver segment showed peripheral "rim" enhancement (arrows) and decreased enhancement of adjacent parenchyma (+). **Origin:**
Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
Description: More caudally, marked (maximum 12 mm) near-circumferential thickening (arrowhead) of caecal wall was noted. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Despite initiation of antibiotics, the liver abscess (*) tended to increase in size with unchanged CT features compared to Fig. 1. Additionally, appearance of minimal perihepatic fluid was noted. **Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Therefore, percutaneous CT-guided puncture and drainage positioning (thick arrows) was performed. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
Description: Therefore, percutaneous CT-guided puncture and drainage positioning (thick arrows) was performed. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Repeated CT after drainage (thick arrow in a) showed decreased size of the treated liver abscess, with near-complete resolution of internal fluid-like purulent content (* in b).

**Origin:**
Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Repeated CT after drainage (thick arrow in a) showed decreased size of the treated liver abscess, with near-complete resolution of internal fluid-like purulent content (" in b).

**Origin:**
Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: After drainage removal, water-enema CT showed near-complete regression of treated liver abscess (*) and persistence of marked solid mural thickening of caecum (arrowheads) consistent with endoscopic diagnosis of carcinoma. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** After drainage removal, water-enema CT showed near-complete regression of treated liver abscess (*) and persistence of marked solid mural thickening of caecum (arrowheads) consistent with endoscopic diagnosis of carcinoma. **Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Figure 5

Description: Follow-up CT (with peroral bowel opacification) showed normal post-surgical status after right hemicolecotomy and lymphadenectomy. Note complete disappearance of treated liver abscess (in a). **Origin**: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)

Description: Follow-up CT (with peroral bowel opacification) showed normal post-surgical status after right hemicolecotomy and lymphadenectomy. **Origin**: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
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