

Care Report

Gemella hepatic abscesses: a case report and review of the literature

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Abstract

Gemella haemolysans is a rare cause of human disease, namely infective endocarditis and brain abscesses. We report herein a case of *Gemella haemolysans* liver abscess in an immunocompetent adult patient secondary to blunt liver trauma and successfully managed by medical-surgical approach.

Key words: *Gemella Haemolysans*; hepatic abscess; blunt trauma.

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Introduction

The liver is exposed to numerous pathogens since it is situated at the distal end of the portal circulation [1]. It also receives up to 25 percent of the cardiac output making it susceptible to hematogenous pathogens in case of systemic bacteremia [1]. The third route bacteria may utilize to reach the liver is through the hepatobiliary tract. Normally, these microorganisms are cleared by the wide array of sinusoids and macrophages laid in the portal spaces. In the appropriate host, however, this may lead to the formation of liver abscesses. Trauma whether blunt or penetrating, is also a well-established cause of pyogenic liver abscesses [1,2].

The most common forms of infectious liver abscesses are of pyogenic and amebic origins [1]. The advent of the interventional approaches and antimicrobial therapies have changed their demographics as well as their prognosis and mortality rates. Despite these advances, inappropriately treated infections remain substantially fatal; the severity of the illness depends on the source of the infection and the underlying condition of the patient.

Pathogens associated with liver abscesses comprise gram negative bacilli of which, *Klebsiella pneumoniae* has emerged as a common pathogen in industrialized countries, gram positive cocci such as streptococcal and enterococcal species, as well as anaerobes, and fungi.

In this paper we report a case of multiple liver abscesses associated with bacteremia secondary to *Gemella haemolysans* bacteremia.

Case Report

In June 2015, a 53-year-old Lebanese man presented to our emergency department for high grade fever (40°C) associated with crampy right upper quadrant abdominal pain, watery non-bloody diarrhea, and dark urine of three days' duration. There was a recent onset rhinorrhea. He reported a recent 2-day travel history to Algeria, 5 days prior to presentation.

He had Factor V Leiden trait, Gilbert Syndrome and a previous episode of transient ischemic attack. He underwent dental procedure 3 months prior to presentation and had a positive family history of pancreatic cancer. He practiced martial arts on a regular basis.

On presentation, the patient was septic, hypotensive, unresponsive to fluid resuscitation with a soft but tender abdomen mainly on the right upper quadrant with hepatomegaly.

Laboratory evaluation was remarkable for WBCs (white blood cells): 13400/μl, Platelets: 132000/ μl, International Normalized Ratio: 1.88, creatinine: 2.66 mg/dl, alkaline phosphatase: 73 U/L, serum glutamic-pyruvic transaminase: 142 U/L, serum glutamic-oxaloacetic transaminase: 106 U/L, Amylase: 34 U/L,

Lipase: 16 U/L, direct bilirubin: 0.7 mg/dl, indirect bilirubin: 0.6 mg/dl, procalcitonin 76.2 ng/ml and presence of WBCs (40-50/hpf) in stool analysis. Malaria smear was negative, a chest X-ray was normal. He was started on ceftriaxone 2g per 24 hours and metronidazole 500mg every 8 hours with a hypothesis of acute cholecystitis in accordance with the Infectious Diseases Society of America guidelines for community-acquired acute cholecystitis [3].

An abdominal ultrasound showed a mildly enlarged liver with an ill-defined hyper-echoic heterogeneous lesion over the right liver lobe particularly in segment VII 6 cm in size. An earlier abdominal ultrasound performed 6 months ago for epigastric discomfort was normal.

Serology for Hepatitis A, B, C, *Echinococcus*, and *Entamoeba histolytica* were all negative.

An abdominal magnetic resonance imaging (MRI) done 2 days later showed a 25 cm span liver, with a 6.5 x 6 cm mixed mass lesion with irregular borders at the level of segment VII with a low T1 and high, heterogeneous T2 signal intensity. A Trans-thoracic echocardiography was normal (Figure 1).

Blood cultures drawn upon admission yielded *G. haemolysans* sensitive to penicillin, cephalothin, tetracycline, tigecycline, erythromycin, clindamycin, vancomycin, teicoplanin and linezolid.

A few days later, a repeat computed tomography (CT) scan showed interval increase in the ill-defined heterogeneous liver lesion, which was now 9.5x9.8cm with central cystic changes and an air bubble associated with a minimal amount of peri-hepatic fluid effusion and a circumferential reactive gallbladder with wall thickening, findings suggestive of an abscess formation.

An ultrasound guided drainage couldn't be successfully completed. A biopsy of the liver abscess showed no signs of underlying malignancy. Culture grew *G. haemolysans*.

Gastroscopy and a colonoscopy showed no pathological findings.

Despite appropriate antibiotic treatment, the patient remained febrile and his white blood cell count continued to rise. Antibiotic regimen was changed to ampicillin, clindamycin and amikacin on day 7. The decision was taken to perform right hepatectomy with a wedge resection of segment VII. Post-operative course was uneventful and patient was discharged home on amoxicillin-clavulanic acid.

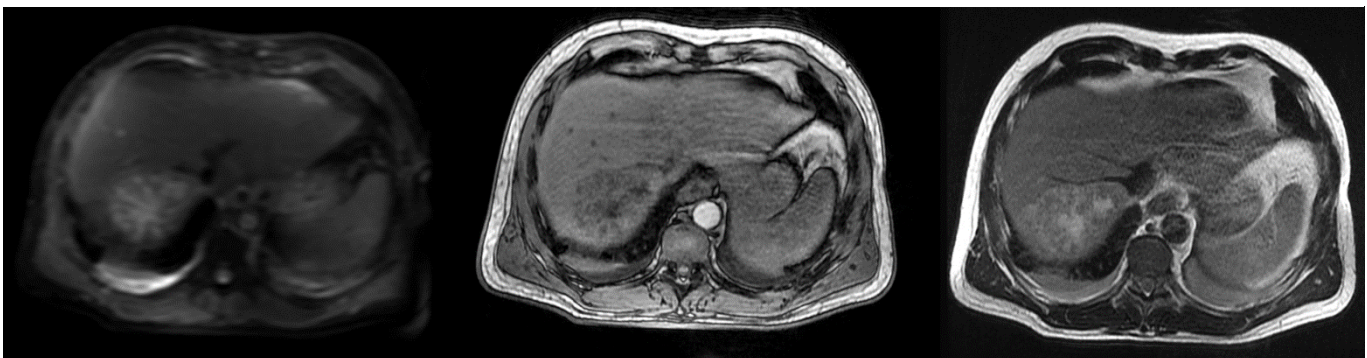
Discussion

Both *G. haemolysans* and *Gemella morbillorum* are considered to be part of the normal oral cavity and upper gastrointestinal flora [4]. However, in immunocompromised individuals, *Gemella spp.* were reported to cause severe infections. Previously damaged tissue constitutes a risk factor as well [5].

Identifying *Gemella* can be attained by either morphological and biochemical criteria or by molecular taxonomic methods. 16S rRNA gene sequencing is the method of choice for identification of *Gemella* and *Gemella*-like isolates [6].

Taxonomically, *G. haemolysans* is classified as gram-positive coccus. It has a gram-variable nature. It is a facultative anaerobic bacterium with fermentative metabolism, catalase and oxidase negative. (β) hemolysis may be observed. It is worth noting that the virulence potential, mode of transmission, and incubation period of such bacteria are still unknown [7]. In vitro susceptibility was determined by a study evaluating 5 isolates of *G. haemolysans* causing subacute endocarditis; all isolates demonstrated a low level resistance to aminoglycosides while high resistance to sulfonamides and trimethoprim, 80% sensitive to tetracyclines whereas all were highly susceptible to penicillins, ampicillin, cephalosporins, vancomycin, chloramphenicol and rifampin [14].

Figure 1. Abdominal MRI shows a 5x6 cm mixed mass lesion with irregular borders of segment VII demonstrating low T1 (left), heterogeneous T2 (center) signal intensity with restriction on DWI (right) denoting hypercellularity.



Nonetheless, *G. haemolysans* was found to be resistant to vancomycin and teicoplanin in one other report [15].

Few cases of *G. morbilloorum* associated liver abscesses have been reported [2,4], with a single case report of *G. haemolysans* bacteremia related to liver abscess [7] (Table 1).

The age range of patients with pyogenic hepatic abscesses is 55 to 65 years [16]. Patients with liver abscess usually complain of fever, right hypochondrial abdominal pain and a wide range of other gastrointestinal complaints such as nausea, vomiting, diarrhea and anorexia. They often present with hepatomegaly. Weight loss and myalgia are also seen [1].

The majority of solitary abscess have a predilection to the right hepatic lobe [1].

Penetrating trauma to the liver, as minor as an ingestion of a toothpick has the potential to result in a liver abscess. Blunt trauma has also been reported in the literature to predispose to abscess formation through disruption of the underlying connective tissues allowing plantation of the opportunistic pathogens. Another attributable factor could be a hematoma formation allowing bacterial seeding [9]. Moreover, illnesses affecting the hepatic integrity through microvascular occlusion as in sickle cell disease, tumorous effects or fibrosis prompt abscess formation [2,17,18].

As our patient practices martial arts, a probable pathophysiology of his liver abscess might have been a blunt trauma to the liver with a subsequent bacterial seeding in the setting of transitional bacteremia induced by the dental manipulation he had.

Workup often reveals elevated WBC counts with left shift and inflammatory markers. Abnormal serum alkaline phosphatase, bilirubin, lactate dehydrogenase, aspartate aminotransferase and serum albumin. Anemia is noted as well [1].

Diagnosis of a liver abscess is made through imaging by ultrasound, CT or MRI evaluation of the liver. Thorough history taking, serology and fluid culture collected percutaneously can specifically confirm the nature of the collection. Blood cultures are positive in 50% of the cases [1].

Treatment modalities include medical, percutaneous and surgical interventions. Combination of early medical and percutaneous intervention has been the mainstay as it is more adequate and less invasive [16].

Percutaneous abscess drainage has often replaced the open surgical approach except when multiple trials have failed to achieve resolution. Open surgical approach is also the choice when complications occur. Small abscesses that are inaccessible to drainage may respond to antimicrobial therapy alone [16,19].

Table 1. Reported cases of *Gemella Haemolysans* and *Gemella morbilloorum* in the literature.

Author	Age	Immune compromising/ predisposing conditions	Relevant imaging	Positive culture source	Therapy	Outcome
Present case ^a	53	Blunt trauma, recent dental procedure	Ultrasound, Abd MRI	Blood, Abscess fluid	Antibiotics, percutaneous drainage, surgical resection	Cured
Iqbal Malik, <i>et al.</i> ^a [7]	42	None	Ultrasound, abd CT scan	Blood	Antibiotics, Percutaneous drainage	Cured
Nam HJ, <i>et al.</i> ^b [8]	56	Diabetes mellitus	Abd CT scan	Abscess fluid	Antibiotics Percutaneous drainage	Cured
Calvo A, <i>et al.</i> ^b [9]	41	Crohn's disease		Pleural fluid		Cured
Arroyo Masa E, <i>et al.</i> ^b [10]	22	None	Abdominal CT scan		Antibiotics Percutaneous drainage	Cured
Hsu CY, <i>et al.</i> [2]	43	Diabetes mellitus	CT scan	Blood culture, abscess culture	Antibiotics Percutaneous drainage	Cured
C. Corchado, <i>et al.</i> ^b [11]	60	None	CT scan	Abscess fluid	Antibiotics Percutaneous drainage	Cured
Millán Rodríguez AB, <i>et al.</i> ^b [12]	70	None		Blood culture	Antibiotics Percutaneous drainage	Cured
Garcia JP, <i>et al.</i> ^b [13]	77	Duodenal ulcer		Blood culture, abscess fluid culture	Antibiotics Percutaneous drainage	Cured
Borro P, <i>et al.</i> ^b [5]	64	None	Ct scan	Abscess fluid	Antibiotics Percutaneous drainage	Cured

^a Isolation of *Gemella Haemolysans*; ^b Isolation of *Gemella morbilloorum*; MRI, magnetic resonance imaging; CT, computerized tomography.

Exact duration of therapy is still unclear and clinically driven. In general, antibiotics should be administered through the parenteral route for 2 to 3 weeks with following maintenance oral therapy for a total of 4 to 6 weeks.

In conclusion, we report herein a case of *Gemella haemolysans* liver abscess secondary to blunt liver trauma, successfully managed by a medico-surgical approach.

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