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Lactococcus lactis ssp *lactis* a rare cause of liver abscesses: A case report and literature review

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ABSTRACT

INTRODUCTION: We present a liver abscess due to *Lactococcus lactis* ssp *lactis*.

CASE PRESENTATION: It is a 27-year-old male patient without history who presented the right hypochondrium pain over 10 days. The physical examination noted right hypochondrium pain and hépatomegaly. The ultrasound showed hepatomegaly with liver abscess for the segments IV and V as well as VII and VIII measuring 13 × 8 cm and 7.6 × 4.3 cm respectively. A computed tomography (CT) revealed an abscess for segments IV and V and VI and VII measuring respectively 107 × 89 mm and 55 × 50 mm. He underwent a surgical drainage after a radiologic drainage and antibiotherapy failure with success.

DISCUSSION: Liver abscesses are rare; affect men over 60 years with co-morbidities and those due to *L. lactis* ssp *lactis* are exceptional. Their prevalence is 0.29–1.47% in series of autopsies and 0.008 to 0.16% in hospitalized patients. The most frequently found germs are gram-negative bacilli (40–60%) and anaerobic bacteria (40–50%). Ultrasound and CT scan make the diagnosis in 90% of cases and orients to the etiology. Percutaneous drainage is the first line for treatment, surgical drainage is reserved for percutaneous drainage failures.

CONCLUSION: Liver abscess due to *Lactococcus lactis* ssp *lactis* is very rare. The clinic, diagnostic methods and treatment of this abscess are identical to other abscesses due to other etiologies. The antibiotics and percutaneous drainage of abscesses have improved the death rate from 40% to 10%–25%.

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1. Introduction

Lactococcus lactis is a gram-positive cocci bacteria commonly found in milk and cheese, which is counted among the non-pathogenic microorganisms. It is used by the food industries in lactic fermentation [1]. However, this bacterium has been identified in different pathologies both in competent and immunocompromised people [2–4]. *Lactococcus lactis* is a rare cause of liver abscesses. We report the case of a 27-year-old patient, with no past medical history and comorbidities, admitted in our service for liver abscess whose *Lactococcus lactis* ssp *lactis* was identified as etiology. The aim of this case is to demonstrate the pathogenicity of this bacterium in immunocompetent people and to emphasize on multivariety of liver abscesses etiologies. This manuscript has been reported in line with SCARE's 2020 Criteria [5].

2. Observation

This is a 27-year-old male patient with no past medical history who presented the right hypochondrium pain and heaviness with abdominal discomfort over 10 days before admission, without neither radiation nor bowel changes habit nor hematemesis, nor rectal or gastrointestinal bleeding. The patient had fever and deterioration of the overall health. The physical examination noted a conscious patient with Glasgow coma scale of 15/15, pressure = 13/07, pulse = 82 bpm) and respiratory rate was 19 c / min), T = 38.5 °C, jaundice, pain of the right hypochondrium, and. The hernial and lymph nodes areas examination was normal, the rectal examination was unremarkable.

Abdominal ultrasound showed hepatomegaly with heterogeneous echogenic areas of segments IV and V as well as VII and VIII, limited measuring 13 × 8 cm and 7.6 × 4.3 cm respectively with an aspect of liver abscess without gallstones (Fig. 1). Enhanced computed tomography (CT) revealed an abscess in the right lobe of the liver with multilocated hypodense collection of segments IV and V and VI and VII measuring respectively 107 × 89 mm and 55 ×

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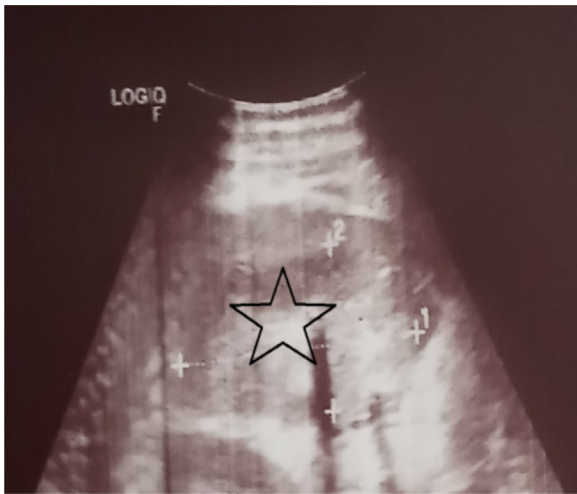


Fig. 1. Abdominal ultrasound which showed liver abscess for our patient.

50 mm (Fig. 2). The fibroscopy was normal and colonoscopy were normal.

Liver function tests: Aspartate amino transferase: 167IU / L Alanine amino transferase: 86IU / L. Alkaline phosphatase: 249 IU / L Gamma glutamyl transpeptidase: 309 IU / L Total bilirubin 15 mg / L. Conjugated bilirubin: 4.8 mg / l Free bilirubin: 103 mg / l. Urea: 0.2 g / l. Creatinine: 6.2 mg / l

The patient spent 10 days in the gastroenterology department where he was treated with triaxon 2 g / day and fragyl 500 mg / day. The radiological drainage was first performed by radiologist but failed and the surgical drainage was decided and performed by a PhD professor in surgery. Under general anesthesia, in supine position, the right subcostal incision was performed. The exploration showed two abscesses of segments V and VIII measuring respectively 10 × 6 cm and 5 × 3 cm, evacuated with drainage of the residual cavities by a salem tube drain, with pus sampling and biopsy of the hull for cytobacteriological study which revealed *Lactococcus lactis* ssp *lactis* sensitive to amoxicillin, fluoroquinolones and cephalosporins (Fig. 3). The postoperative were simple with clavulanic acid amoxicillin 1gX4 / day as antibiotic therapy, no surgical site infection occurred until the patient was discharge from hospital at D8, after the drains removal. The follow up after six moth was uneventful.

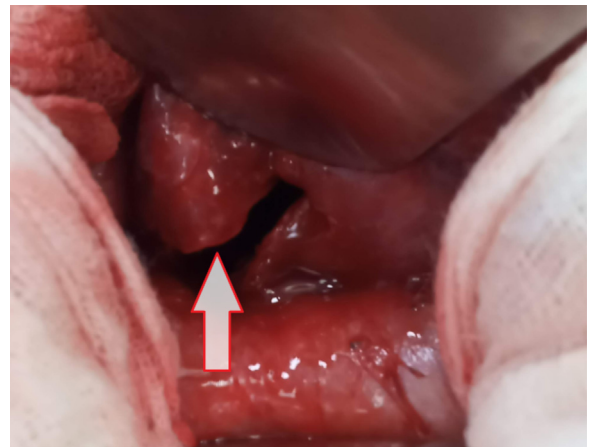


Fig. 3. Perioperative image for our patient; note the residual cavity after abscess evacuation.

3. Discussion

Liver abscesses are rare, and mainly affect men over 60 years with co-morbidities [6]. However, They are the most common intra-abdominal abscesses. There are two main etiologies: pyogenic abscesses and amoebic abscesses more common in developing countries. The other etiologies are increasingly rare [7]. The prevalence of bacterial abscesses is 0.29–1.47% in series of autopsies and 0.008 to 0.16% in hospitalized patients. Their incidence is between 8 and 20 cases per 100,000 hospital admissions. It is mainly pathology of the middle-aged people, between 50 and 70 years, probably due to the prevalence of bile duct diseases in this age group, which are currently the leading cause of hepatic abscesses [8]. The most frequently found germs are gram-negative bacilli (40–60%) and anaerobic bacteria (40–50%). Some people with risk factors can explain the occurrence of liver abscesses due to unusual germs. In immunocompromised patients, fungal agents are mainly responsible for multiple abscesses. Koch's bacillus is exceptionally found in liver abscesses. *Yersinia enterocolitica* is typically responsible for liver abscess in patients with diabetes, iron overload, cirrhosis or other comorbidities [6,9]. There are six species (*L. garveiae*, *L. lactis*, *L. piscium*, *L. plantarum*, *L. raffinolactis*, *L. xylosoe*), three subspecies (*L. lactis lactis*, *L. lactis cremoris*, *L. lactis hordniae*) and a biovar (*L. lactis lactis diacetyactis*) exist. Phenotypically similar, the differentiation between these bacteria is first made on biochemical criteria, and in particular, by studying the use of

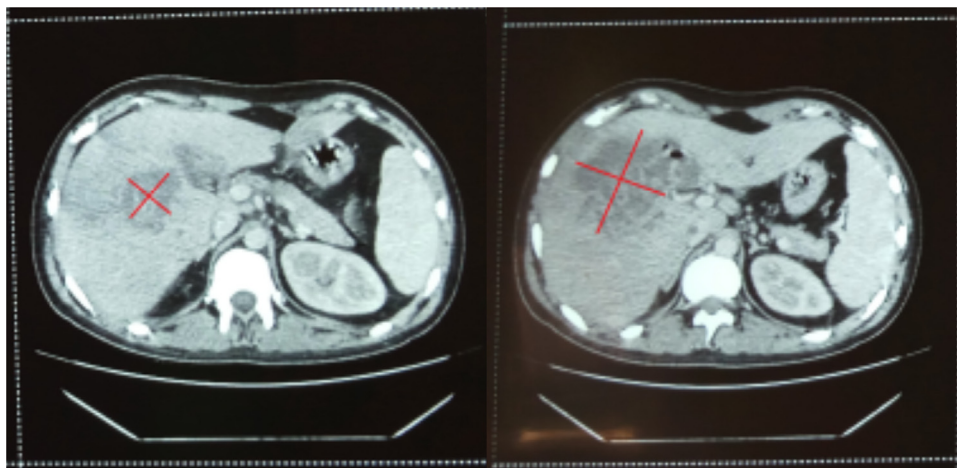


Fig. 2. An abdominal contrast-enhanced computed tomography (CT) revealed an abscess in the right lobe of the liver with multiloculated hypodense collection.

carbohydrates, which allows the distinction between homo- and heterofermentative bacteria. Only the species of *L. lactis*, *L. lactis* ssp. *lactis*, *L. lactis* ssp. *cremoris*, and *L. lactis* ssp. *Lactis* biovar *diacetyactis* are used for the production of fermented milk products. *L. lactis* *cremoris* is particularly preferred for the production of cheese [10–12]. Exposure to unpasteurized dairy products has been suggested as a risk factor for *L. lactis* *cremoris* infection [13]. *Lactococcus lactis* spp. *lactis* is mainly used in the dairy industry to make cheese and other fermented foods and is considered as non-pathogenic bacteria. However, some infections have been reported, especially in immunocompromised people. Endocarditis described for spp *lactis* and hepatic abscess for spp *cremoris* were the most common sites of infection caused by *L. lactis*. Cases of chronic diarrhea in children, peritonitis in immunocompromised adults, endocarditis, brain abscess empyema, pulmonary embolism of septic origin or septicemia by arterial catheterization have been reported for LL spp *lactis* [3,4,14]. The liver abscess caused by *L. lactis* ssp *lactis* is very rare and may also occur after exposition to unpasteurized dairy products as reported for *L. lactis* ssp *cremoris* but there is no scientific report. Furthermore, in our research, we did not find any cases of hepatic abscess due to LL spp *Lactis* reported in the literature. The typical clinical picture is fever (73–93%), chills (43–80%) pain in the right hypochondrium (45–80%), and painful hepatomegaly (30–50%), jaundice (11–60%), vomiting (20–40%), weight loss (14–50%), asthenia (25%), dyspnea (10–17%), cough (14%), and diarrhea (8–17%). In 15–19% of cases, HA is complicated by septic shock. More rarely, the clinical presentation may be that of a surgical abdomen, pneumonia, or isolated fever [15]. The clinical symptomatology most often observed is classic associating the three physical signs constituting the triad of Fontan. It is painful, hepatomegaly and fever. The presence of jaundice is considered to be a factor of poor prognosis [16]. Ultrasound and CT scan make the diagnosis in 90% of cases and orients to the etiology [17]. The ultrasound aspects of pyogenic liver abscesses in diabetics are polymorphic and vary according to the stage of development [18]. The multidetector CT with contrast enhanced has a higher sensitivity than ultrasound. The pathognomonic sign is the presence of air but this can be also observed several days after embolization procedures [19]. For our patient, the CT scan found multiple contiguous and multiloculated formations measuring 14 × 11 cm × 12 cm: appearance in favor of hepatic abscess and typical of the suppuration phase. Our patient is 27 years old, with no history or comorbidities, without risk factors that could explain the pathogenicity of this bacterium which is considered non-pathogenic in him. We performed esogastroduodenal fibroscopy and colonoscopy to look for other possible sites of infection, but these were unremarkable. Liver and acquired immunodeficiency virus (HIV) were negative. Treatment of amoebic abscesses is based on metronidazole 7–10 days, followed by a luminal amebicide (paromycin, iodoquinol or diloxanide furoate). This treatment is very effective in most patients with amoebic abscesses and drainage is not usually necessary. Percutaneous drainage or needle aspiration is recommended for the exclusion of pyogenic abscesses or if there is no response to imidazole treatment after 3–5 days. It is also recommended for large abscesses of the left lobe of the liver and for abscesses at risk of rupture [20]. Percutaneous drainage is currently used as the first line. Surgical drainage is reserved for percutaneous drainage failures, inaccessible abscess, patients with other concomitant intra-abdominal pathology, multiple and large abscesses or ruptured abscess with signs of peritonitis and can be performed by laparotomy or laparoscopy [15]. The success rate of percutaneous drainage is 69–90% in combination with antibiotic therapy. It is performed under ultrasound or tomodesitometry [8,21]. According to Haider et al. [21] the multilocality and size of the abscess are factors influencing the success of percutaneous drainage. [22]. According to Serraino et al., the most common com-

plication was pneumonia, which was observed in 11.9% of patients, and the hospital mortality rate was 10.1%. Nowadays, imaging data, more effective use of antibiotics and percutaneous drainage of abscesses have improved the death rate from 40% to 10%–25% [23]. This case elucidate the possibility of pathogenicity of *Lactococcus lactis* ssp *lactis* in immunocompetent people. Further studies are necessary to reveal the mechanism.

4. Conclusion

Although it is considered as non-pathogenic, *Lactococcus lactis* ssp *lactis* can be pathogenic in young and immunocompetent people and can cause several human pathologies including hepatic abscesses. Hepatic abscess due to *Lactococcus lactis* ssp *lactis* is very rare. While the pathology is considered more common in immunocompromised and / or elderly people, young and immunocompetent people can develop liver abscesses, even for bacteria considered as non-pathogenic.

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

The study is exempt from ethical approval in our institution.

Consent

Written informed consent was obtained from the patient for publication of this case.

Authors contribution

Khalid ElHattabi: designed the study, wrote the protocol and the first draft of the manuscript.

Mounir Bouali: designed the study, wrote the protocol and the first draft of the manuscript.

KABURA Sylvestre: designed the study, wrote the protocol and the first draft of the manuscript.

Fatima Zahra Bensardi: managed the analyses, and the correction of the manuscript.

ElBakouri Abdelillah: managed the analyses, and the correction of the manuscript.

Zerouali: Performed the laboratory analysis and the correction of the manuscript.

Fadil Abdelaziz: managed the analyses, and the correction of the manuscript.

All authors read and approved the final manuscript.

Registration of research studies

Not applicable.

Guarantor

KABURA Sylvestre.

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