CASE REPORT

Streptococcus bovis-related cholecystitis

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SUMMARY

Acute cholecystitis is a common inflammatory condition of the gallbladder caused most commonly by *Escherichia coli*, *Enterococcus*, and *Klebsiella* organisms. *Streptococcus bovis* is a Gram-positive, catalase-negative, anaerobic coccus found as a commensal inhabitant of the digestive system in 16% of healthy people. We report a rare case of acute cholecystitis caused by *S bovis* and discuss its implications with regard to the two known *S bovis* biotypes (I & II) both of which are associated with a number of other gastrointestinal diseases.

BACKGROUND

The first reported case of *Streptococcus bovis*-related cholecystitis was reported in North America (1978) with fewer than 30 reported incidences documented in the literature to date. *S bovis* cholecystitis is more likely to be found in older patients (>60 years) with malignancy and comorbidities and has profound consequences depending on biotype with regard to other gastrointestinal diseases.

CASE PRESENTATION

A 60-year-old Polish gentleman presented to the emergency department with a 4-day history of the right upper quadrant pain, nausea, diarrhoea and fevers.

The patient's medical history was significant for transient ischaemic attack (2011), pacemaker in situ for a second degree heart block (2011), type II diabetes (2010) and hypertension (2009).

Social history was that of an unemployed labourer with no recent animal contact, no intravenous drug abuse and multiple sexual partners. He had a 30-year pack smoking history and 14 units of alcohol intake per week.

Medications included aspirin 75 mg once daily, atorvastatin 40 mg once daily, ramipril 5 mg once daily, gliclazide 60 mg once daily, metformin 850 mg twice daily and fenofibrate 145 mg once daily.

Emergency department vital signs demonstrated tachycardia (92 bpm) pyrexia (39.2°C) with associated diaphoresis. Abdominal examination was significant for Murphy's positive right upper quadrant tenderness and guarding.

Laboratory haematological findings of deranged liver function tests and raised inflammatory markers.

Initial emergency department management included oxygen therapy, intravenous empiric co-amoxiclav, fluid resuscitation and analgesia. A urinary catheter was inserted, blood cultures performed and an abdominal ultrasound and CT scan performed demonstrating radiological features

consistent with acute calculus cholecystitis (figures 1 and 2). The patient remained pyrexial (38.7°C) for over 12 h, preliminary blood culture results demonstrated Gram-positive cocci. Forty-eight hours after admission a definitive blood culture of *S bovis* was received and Tazobactam/piperacillin begun according to sensitivities and microbiology advice. Forty-eight hours later the patients' liver function tests improved, his pyrexia resolved and repeat blood cultures were *S bovis*-negative.

Viral hepatitis, Epstein-Barr virus and cytomegalovirus screens were negative. Echocardiogram showed no abnormalities. The patient was scheduled for interval screening colonoscopy and laparoscopic cholecystectomy screening. Colonoscopy showed three benign hyperplastic polyps.

DIFFERENTIAL DIAGNOSIS

- ▶ Acute calculus cholecystitis.
- ▶ Ascending cholangitis.

Figure 1 Transhepatic view of gallbladder: classic acoustic shadowing showing multiple cholelithiasis.

Figure 2 CT abdomen showing thickened wall of gallbladder and pericholecystic fluid consistent with cholecystitis.

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- Viral hepatitis.
- Autoimmune hepatitis.

TREATMENT

S bovis bacteraemia: Tazobactam/piperacillin 4.5 g thrice daily intravenous for 10 days.

OUTCOME AND FOLLOW-UP

Patient is currently well and awaiting an interval laparoscopic cholecystectomy.

DISCUSSION

S bovis biotype I increases the risk of colorectal cancer and infective endocarditis while biotype II increases the risk of non-colonic cancers and hepatobiliary disease. The commonest clinical presentation of all *S bovis* infections is bacteraemia.

Less than 30 reported incidences of *S bovis*-related acute cholecystitis are documented in the literature. It is more likely to be found in older patients (>60 years) with malignancy and those with comorbidities as reported by Medina *et al.*¹

S bovis biotype I and colon cancer association was first described in 1951 by Roses *et al.*² with 15–25% of *S bovis* biotype I bacteraemia having concomitant colon cancer.

It is yet to be determined if *S bovis* biotype I is a causative agent of colon cancer or if pre-existing colon cancer makes the lumen of the large intestine more hospitable to the overgrowth of *S bovis*. Little attention has been given to the role of microbial infection in pathogenesis of colon cancer as highlighted by Collins *et al.*³. Cell wall antigens of *S bovis* can stimulate production of inflammatory cytokines with subsequent formation of hyperneoplastic crypts in murine models according to Beeching *et al.*⁴ Tumour development may allow *S bovis* to pass across colonic epithelium into systemic circulation. Six percent of all infective endocarditis can be attributed to *S bovis* biotype I. There is a high rate of embolic events and bi-valvular involvement with *S bovis* bacteraemia as well as an increased risk of seeding in the setting of in situ pacemakers. There is a strong link between endocarditis attributed to *S bovis* and the increased risk of concomitant and future colon cancer as reported by Tripodi *et al.*⁵

There is more than 50% concordance between *S bovis* biotype II and hepatitis. *S bovis* biotype II may be promoted by impaired hepatic function and impaired secretion of intestinal

luminal immunoglobulin's, which aids its translocation from the intestinal lumen into the portal venous system as highlighted by Jean *et al.*⁶ A compromised hepatic reticuloendothelial phagocytic function may then contribute to the development of *S bovis* bacteraemia. There is an increased risk of hepatocellular carcinoma with *S bovis*-induced hepatitis documented by Tripodi *et al.*⁵

Learning points

- *Streptococcus bovis*-related acute cholecystitis is extremely rare.
- There is a correlation between *S bovis* and old age, neoplasms, cardiovascular disease, diabetes, hepatitis and biliary disease.
- A colonoscopy is required for investigation of colon cancer in biotype I.
- An echocardiogram is essential due to increased risk of endocarditis and mortality in *S bovis* bacteraemia.
- Viral hepatitis screens and biotyping of blood isolate are also necessary.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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