



A curious case of chronic Q fever: a case report of protracted diagnosis of *C. burnetii* chronic infection

Kelly, A¹; O'Regan, R¹; Al-Yammahi, A¹; McConkey, S^{1,2}; De Barra, E^{1,2}; Coakley, P¹; Gopinathan, D¹; McNally, C¹
Department of Infectious Diseases, Beaumont Hospital, RCSI Hospital Group, Dublin, Ireland¹
Department of International Health and Tropical Medicine, Royal College of Surgeons in Ireland, Dublin²



Introduction

- Q fever is a zoonotic infection caused by the pathogen *Coxiella burnetii*.
- First described in 1937, sheep, goats and cattle remain the main reservoir of infection with transmission primarily through direct contact or inhalation of aerosolised spore-like particles and droplets.
- Incidence of Q fever traditionally peaks during winter and spring (lambing season) with approximately 15 cases reported annually in Ireland.
- Here, we describe a case of a protracted diagnosis of chronic Q fever in a 66 year old Caucasian male following referral from his GP for further investigation of an iron deficient anaemia, weight loss and night sweats.

Case

- 66 year old Caucasian male admitted to an Irish hospital in December 2019 upon referral from his GP for an iron deficient anaemia, 9 kg weight loss and intermittent pyrexia over a 4 month period.
- Patient reports 2 month history of productive cough with green sputum and two episodes of haemoptysis.
- No recent episodes of melena, haematochezia or haematemesis. OGD and colonoscopy yielded normal small bowel biopsy with no obvious pathology as a cause for anaemia.
- CT TAP revealed multiple bilateral renal hypodensities, hilar lymphadenopathy and a 6.1. x 7.4cm heterogenous mass in midpole of right kidney. Focal abnormality in lateral aspect of left kidney.
- Follow up renal biopsy was significant for necrotising granulomatous inflammation concerning for either infectious aetiology versus a systemic granulomatous disease.
- Patient continued to exhibit persistent weight loss (45kg) and intermittent pyrexial episodes.
- Subsequent renal biopsy specimens sent for TB and panfungal PCR testing were negative as was urinary TB PCR and screening for granulomatous disease.
- Quantiferon, Rickettsia, Brucella and *T.pallidum* serology negative.
- History revisited, patient reported history of exposure to lambs as well as previous travel to Australia on multiple occasions.
- Subsequent *C. burnetii* serology sent returned midly positive and a working diagnosis of chronic Q fever was established.

Case

- Blood cultures were negative and an ECHO revealed no cardiac vegetations as a complication of chronic *C. burnetii* infection.
- PET scan revealed mass like lesion with FDG avidity in right kidney with FDG avid focus at caudate lobe of liver also.
- Liver focus found to be representative of a haemangioma on follow up CT.
- Follow up *C. burnetii* serology more strongly positive and patient was commenced on doxycycline 100mg po BD and hydroxychloroquine 200mg po TDS.
- He reported a gradual improvement in his symptoms and weight gain over several months on first line antimicrobial therapy.
- Clinical improvement was complemented by follow up decrease in titre serology levels over a 15 month period.
- Repeat CT imaging revealing amelioration of previously noted diseased areas corresponding with commencement of antimicrobial therapy.

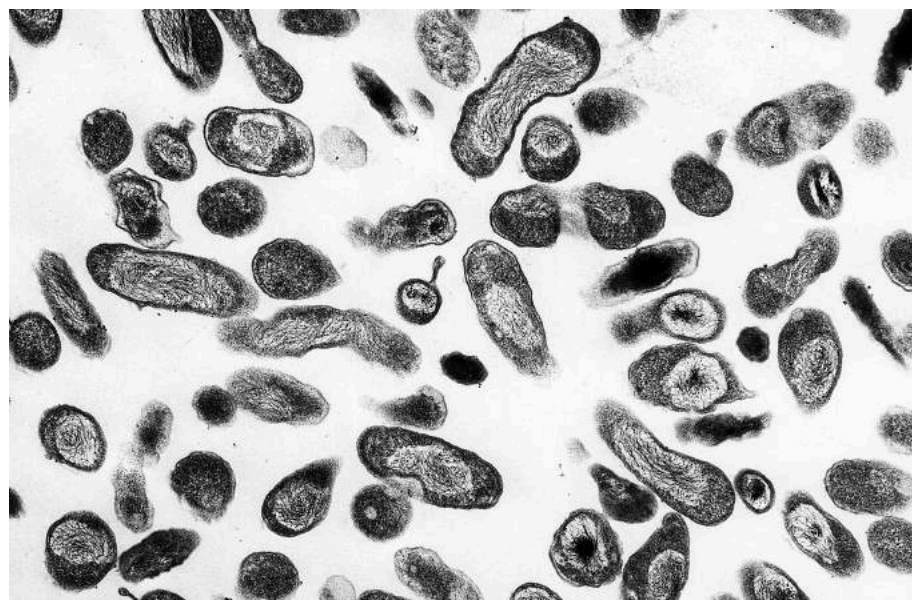


Fig1- *Coxiella burnetii*-pathogenic agent for Q fever

Investigations

- **Admission Bloods:**
Hb 7.1 g/L
MCV 74.8 fl
WCC 14.24 x 10⁹/L Neutrophils 11.39 x 10⁹/L
CRP 114 mg/L

- **Microbiology: (including from renal biopsy)**
Quantiferon – negative
Urinary TB PCR- negative

- **Serology:**
Rickettsia- negative
Brucella- negative
T.pallidum- negative
Beta-D-Glucan- negative

C. Burnetii

14/2/20	21/5/20	3/7/20
IgG P1 1:128	IgG P1 1:512	IgG P1 1:128
IgG P2 > 1:1024	IgG P2 >1:1024	IgG P2 1:512
IgM P2 > 1:192	IgM P1 >1:192	IgM P2 1:96
IgA P1 <1:48	IgM P2 1:96	IgA P1 <1:48

• **Connective tissue screen:**

ANF+ speckled 1:320
MPO 34
PR3 0.9
C3 1.77
C4 0.42
Serum ACE 28
Urinary SCD163 0.24

Discussion

- Q fever is caused by the obligate intracellular gram negative bacteria *Coxiella burnetii*.
- The acute phase of the illness typically manifests as a non specific pyrexia, hepatitis or atypical pneumonia although the majority of cases are asymptomatic.
- Chronic infection typically occurs in immunocompromised patients and most commonly presents as endocarditis.
- Interestingly, this gentleman with chronic Q fever did not present with endocarditis but rather non specific symptoms of weight loss, fatigue and iron deficiency anaemia.
- Patient initially had weakly positive *Coxiella* serology on numerous occasions coupled with the absence of classical symptoms and inconclusive imaging thus leading to a protracted final diagnosis.
- Phase 1 antibody titres subsequently became more strongly positive and patient exhibited marked clinical improvement upon commencing first line antimicrobial therapy against *C. burnetii*.
- Patient continues to be followed in OPD clinic and on last review remains clinically well while completing an 18 months course of therapy.

Take home points

- This case serves to remind clinicians of the elusive presentations of chronic infection with *C. burnetii* and the challenges faced in making the diagnosis.
- It highlights the importance of maintaining a high index of suspicion for *C. burnetii* infection especially in patients with significant risk factors for same.
- Finally, it underscores how early recognition and prompt treatment of *C. burnetii* infection with appropriate antimicrobial cover can lead to favourable clinical outcomes in this patient population.