CASE REPORT

Myocardial air collections as a result of infection with a gas producing strain of *Escherichia coli*

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Certain strains of *Escherichia coli* have been shown to cause gas accumulation in—for example, emphysematous pyelonephritis. This paper describes a patient with intramyocardial air collections resulting from an intramyocardial infection with gas forming *E coli*.

We describe the case of a man with intramyocardial air collections resulting from an intramyocardial infection with gas forming *Escherichia coli*.

CASE REPORT

A 55 year old man was admitted to our hospital with de novo diabetes mellitus, dehydration, and high fever. Blood cultures demonstrated *Escherichia coli* (identified using the VITEK® identification system (bioMérieux Inc, Hazelwood Missouri, USA)) bacteraemia, for which antibiotic treatment with ceftriaxone (2 g/day intravenously) was initiated. Abdominal computed tomographic (CT) scanning revealed multiple splenic abscesses, and *E coli* was cultured from the aspirates of these abscesses. During rehydration, the patient developed

signs of left sided heart failure. A cardiac ultrasound demonstrated left ventricular inferoposterolateral wall motion abnormalities, indicating a recent myocardial infarction. A thoracic CT scan surprisingly revealed intramyocardial gas collections in the left ventricle (fig 1A, B). We hypothesised that these might result from a localised myocardial infection with gas producing *E coli*, and indeed the *E coli* that was cultured from the blood was found to be gas forming (fig 1C). Intramyocardial gas gangrene is a rare finding, which has previously been reported in association with infections with gas forming clostridium.^{1 2} However, certain strains of *E coli* are able to produce large amounts of nitrogen, carbon dioxide, and hydrogen in vitro,^{3 4} and have been shown to cause gas accumulation in vivo—for example, in emphysematous pyelonephritis.⁵ Serial thoracic CT scans showed that the intramyocardial air collections decreased in size during antibiotic treatment. Unfortunately, the patient died during an episode of ventricular fibrillation. Postmortem analysis confirmed the inferoposterolateral intramyocardial

Abbreviations: CT, computed tomography

Figure 1 (A). Computed tomography (CT) scan (three dimensional reconstruction) showing intramyocardial air collections (arrow). (B) CT scan (transverse) showing intramyocardial air collections (arrow). (C) Agar tubes demonstrating gas production by cultured *Escherichia coli* (lower tube with agar before addition of cultured *E coli*; upper tube after overnight incubation with *E coli* showing accumulation of gas within the agar). (D) Macroscopic picture of intramyocardial abscess (arrows).

Take home messages

- We report a patient with intramyocardial air collections resulting from an intramyocardial infection with gas forming *Escherichia coli*
- The patient died during an episode of ventricular fibrillation
- Intramyocardial gas gangrene is rare but has been reported before, usually in association with infections with gas forming clostridium

abscess, which was culture positive for *E coli*, in a recently infarcted area (fig 1D).

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REFERENCES

- 1 Guneratne F. Gas gangrene (abscess) of heart. *N Y State J Med* 1975;**75**:1766–9.
- 2 den Bakker MA, Werdmuller BFM, Niemans A, *et al*. Gas gangrene of ischaemic myocardial tissue caused by *Clostridium septicum*. *Ned Tijdschr Geneesk* 1996;**140**:2547–50.
- 3 Patel NP, Lavengood RW, Fernandes M, *et al*. Gas-forming infections in genitourinary tract. *Urology* 1992;**39**:341–5.
- 4 Huang J-J, Chen K-W, Ruaan M-K. Mixed acid fermentation of glucose as a mechanism of emphysematous urinary tract infection. *J Urol* 1991;**146**:148–51.
- 5 Hazouard E, Barat D, Lanotte P, *et al*. Emphysematous pyelonephritis related to specific gas-forming *Escherichia coli* without diabetes mellitus. *Intensive Care Med* 1999;**25**:628–30.