Clinical Case Report

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Successful treatment of an acute infective endocarditis secondary to fish bone penetrating into left atrium caused by *Granulicatella adiacens* and *Candida albicans*

A case report

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Abstract

Rational: Infective endocarditis caused by a foreign body of the upper digestive tract is rare. We report a rare case of *Granulicatella adiacens* and *Candida albicans* coinfection acute endocarditis combined with systematic embolization caused by a fish bone from the esophagus penetrating into the left atrium.

Patient concern: A 42-year-old woman was admitted to our hospital because of fever, abdominal pain, headache, and right limb weakness.

Diagnoses: Clinical examination indicated endocarditis and systemic embolisms secondary to a fish bone from the esophagus penetrating into the left atrium. The emergency surgery confirmed the diagnosis. Cultures of blood and vegetation show *G adiacens* and *C albicans*.

Interventions: Antimicrobial therapy lasted 6 weeks after surgery.

Outcomes: The patient was discharged with excellent condition7 weeks after hospitalization and was well when followed 6 months later.

Lessons: The successful treatment of this patient combines quick diagnosis, timely surgery, and effective antimicrobial regimen. This rare possibility should be kept up in mind in acute infective endocarditis cases.

Abbreviations: *C. albicans*. = *Candida albicans*, *G. adiacens* = *Granulicatella adiacens*, GP = gram-positive, IE = infective endocarditis, NVS = nutritionally variant streptococci.

Keywords: acute infective endocarditis, *Candida albicans*, esophageal perforation, fish bone, foreign body, *Granulicatella adiacens*

1. Introduction

Infective endocarditis (IE) is a serious disease of the endocardium of the heart and cardiac valves, with high morbidity and mortality. The infection is usually associated with traumatic or iatrogenic metallic foreign body such as bullets, metallic fragments, iatrogenic needles, fragments of catheter, intravascular stents, or filters.[1–5] However, IE caused by foreign bodies of the upper digestive tract is rare. Here, we report a unique case of *Granulicatella adiacens* and *Candida albicans* coinfection acute IE, which was secondary to a fish bone penetrating through the esophagus into the left atrium. The patient was successfully cured by antibiotic therapy combined with surgical removal of the foreign body.

2. Case presentation

A 42-year-old Chinese woman was admitted to our emergency department because of fever and abdominal pain for 2 days, headache for 1 day, and right limb weakness for 5 hours. The patient had no obvious underling disease history. Two weeks earlier, the patient had a transient throat pain after eating fish. Before admitting, she received 2-day empirical ampicillin/sulbactam therapy because of fever and abdominal pain. Physical examination showed vital signs were normal except a temperature of 38.0°C. Heart and lungs examination was unremarkable. She had left upper abdominal pain but without a sign of peritoneal irritation. Her right lower limb muscle strength was level 3.

Blood tests showed elevated white blood cell count of 12.8×10^9 cells/L (87.9% neutrophils), the hemoglobin level was 115 g/L, and the platelet count was only 27×10^9 cells/L. High-sensitivity C-reactive protein was 166 mg/L. Echocardiography

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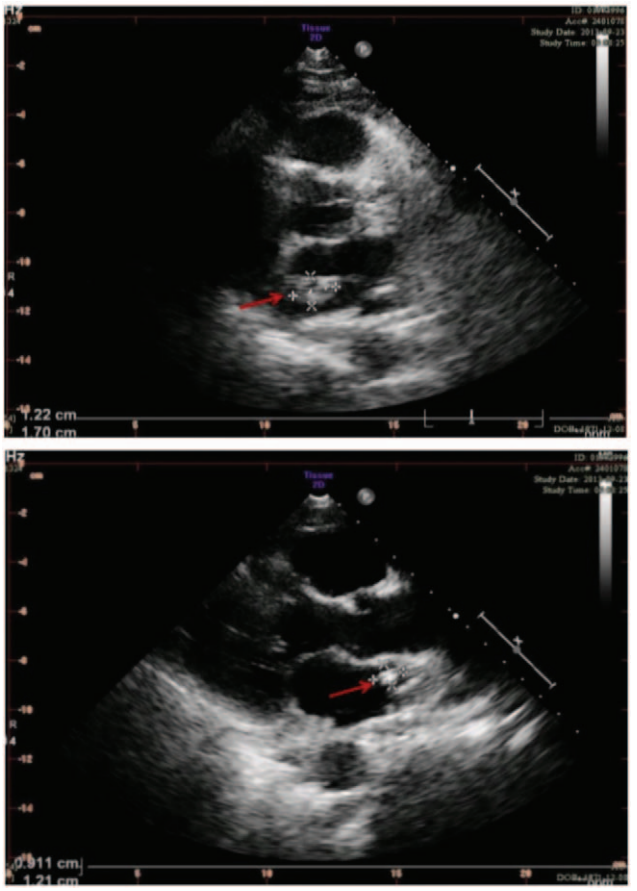

Figure 1. Echocardiography revealed 2 masses in the left atrium (approximately 1.0 and 0.9 cm in diameter).

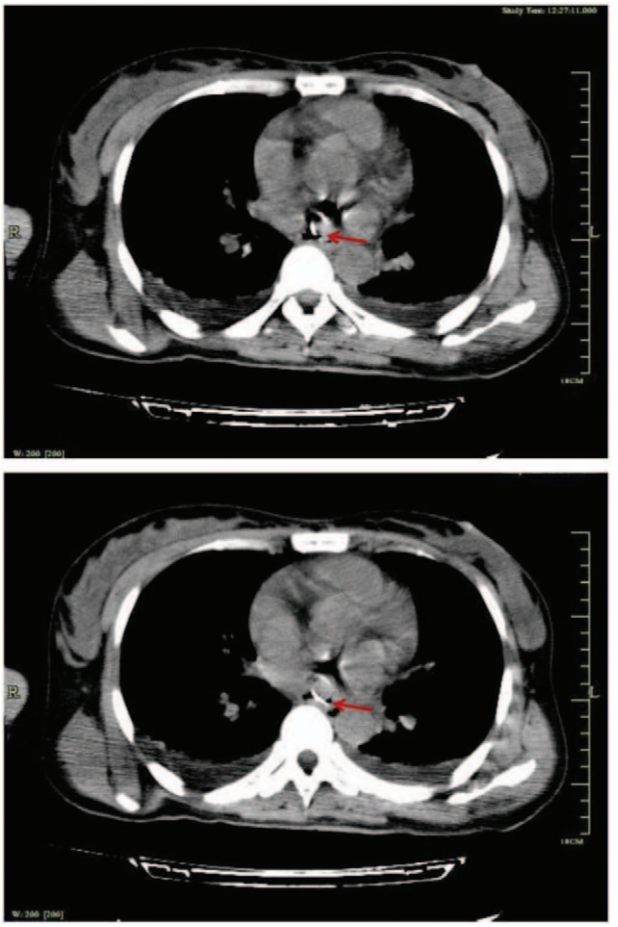

Figure 2. CT scans showing a spiny foreign body perforating through the anterior wall of the esophagus and into the left atrium (arrow). CT = computed tomography.

revealed 2 masses in the left atrium (approximately 1.0 and 0.9 cm in diameter) (Fig. 1). The contrast enhanced computed tomography scan of chest and abdomen revealed a suspected foreign body perforating through the anterior wall of the esophagus into the left atrium (Fig. 2), and infarction of spleen. Magnetic resonance imaging of the brain revealed multiple lesions in the cerebral hemisphere and pons (Fig. 3).

She received meropenem (500 mg, once every 8 h) for empirical antibiotic treatment after admission to the emergency department. Four blood cultures were drawn before the antibiotic therapy. According to the clinical examinations, we suspected acute IE with systemic embolisms secondary to foreign body (fish bone) penetrating. We performed emergency surgery, and found a fish bone penetrating into the left atrium via the esophagus anterior wall. The fishbone was 4.0 cm in length, attached to the left atrium wall, and with a large vegetation around it. We also sent 2 sets of vegetation culture immediately.

On the next day after surgery, 2 sets of blood culture and 1 vegetation culture grew Gram-positive (GP) cocci, which were identified as *G adiacens* by use of the Vitek 2 GP identification kit (Vitek 2 GP, bio Merieux VITEK-2, Durham, England). Another sample blood and sample vegetation culture grew *C albicans* on the third day. Antimicrobial susceptibility test of *G adiacens* was performed using isolates by the disc diffusion method, and the results showed that the pathogen was susceptible to penicillin, ampicillin, ceftriaxone, levofloxacin, vancomycin, and meropenem; moderately sensitive to erythromycin; and resistant to clindamycin. Antifungal susceptibility to *C albicans* was not assessed. The antimicrobial regimen was then adjusted to intravenous meropenem (500 mg, once every 8 h) combined with voriconazole (loading dose 70 and, 50 mg thereafter, once daily) on the third day. The blood cultures became negative on the fourth day after antimicrobial treatment started. As the clinical status improved, the antimicrobial regimen was then adjusted to moxifloxacin (400 mg, once daily) and fluconazole (400 mg, once daily) 2 weeks after the initial treatments. The antibiotic therapy lasted for another 4 weeks until the body temperature was well under control. The patient was discharged with excellent condition in week 7 and was followed up for 6 weeks without complication.

3. Discussion

We report a unique case of acute IE caused by *G adiacens* and *C albicans* coinfection, which was secondary to a fish bone penetrating through the esophagus and into the left atrium. The patient was successfully treated by antimicrobial therapy combined with surgical intervention.

Penetrating intracardiac foreign body-related endocarditis are usually caused by traumatic injury or introduced into the heart by blood flow as a complication of interventional techniques or minimally invasive. However, IE caused by a foreign body of the

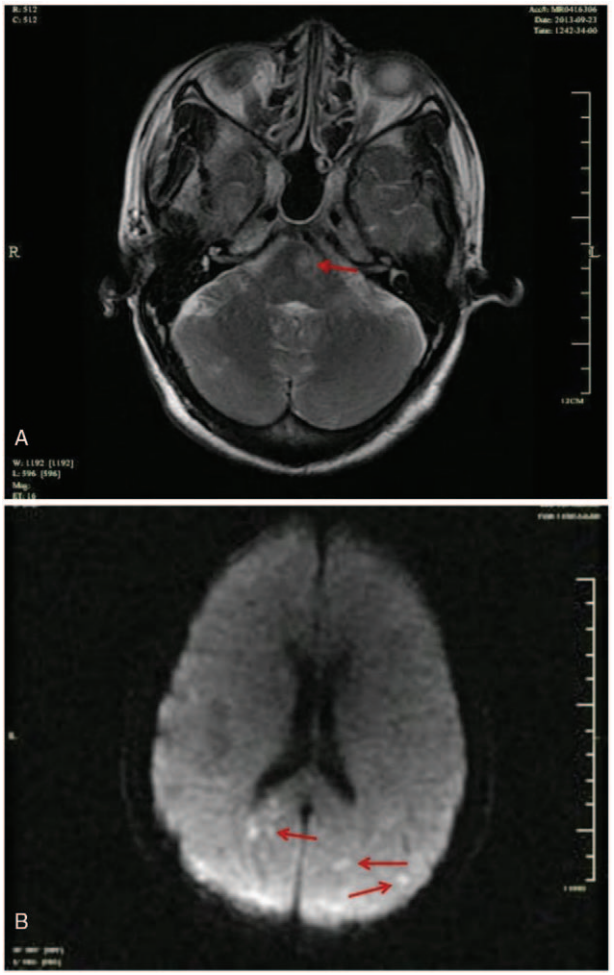

Figure 3. (A) Lesion in left pons which may be responsible for right limb weakness. (B) Multiple lesions in the cerebral hemisphere which may indicate cardiogenic cerebral infraction.

upper digestive tract was exceptionally rare. A fatal case in 1972 showed a swallowed toothpick perforated duodenum, then entered into the inferior vena cava, embolized the right ventricle, and eventually caused candida endocarditis, tricuspid valve, pulmonary emboli, and infraction. The patient had documented candidemia for 9 months before definite diagnosis, however, the candida probably contaminated the toothpick in the oral cavity.[6] Another case in 2011 presented a 35-year-old man who had probably inhaled or ingested a metallic object, with subsequent migration through the bronchus into the left atrium, associated with endocarditis due to *Streptococcus anginosus* and fusobacterium.[7] Similar to our case, both were acute IE, both foreign bodies were found on the left atrium, lead to polymicrobial sepsis and systematic embolism, both organisms were of normal flora in the oral cavity which were carried along with the foreign bodies.

Granulicatella species, known as nutritionally variant streptococci (NVS), include *G adiacens*, *G elegans*, *G balaenopterae*, and *G para-adiacens*.[8] NVS is normal flora of oral cavity, intestinal tract, genitourinary, and accounts for up to 6% of all streptococcal endocarditis.[9] Preexisting cardiac pathology, prior dental manipulations in the past 6 months, and neutropenia are frequent risk factors in endocarditis due to Granulicatella.[9] NVS endocarditis is associated with high mortality. NVS grow slowly and fastidiously, leading to a long-time requirement for isolation, identification, and antibiotic susceptibility test. Furthermore, despite in vitro susceptibility, treatment failure is still observed in about 41% of cases, and relapse rate is up to 17%.[9] NVS is increasingly resistant to penicillin, and only 55% of *G adiacens* isolates were penicillin sensitive,[10] making a big challenge to empirical penicillin therapy.

Candida endocarditis is also rare, accounting for <2% of all IE cases, usually occurs in the intravenous drug users and patients at risk for invasive fungal infections.[7] Early diagnosis of candida endocarditis remains difficult. It is more likely to have embolism complication and giant vegetation. The treatment of candida endocarditis generally involves infected valve removal accompanied by antifungal therapy. Despite antifungal and surgical therapy, mortality approaches 80% in some series.[11] Because of the rarity of cases and lack of large prospective cohorts, the optimal therapy of candida endocarditis is poorly defined. The recommended treatment is an amphotericin B-based regimen plus surgical intervention, often followed by long-term therapy using fluconazole.[12,13] Fluconazole-containing antifungal therapy, with or without valve replacement, followed by prolonged fluconazole suppression is also reported to be effective in patients with candida endocarditis.[14]

As mentioned above, *G adiacens* and *C albicans*, as normal flora of the oral cavity, can cause fetal IE each. We reported, for the first time, an acute IE case caused by *G adiacens* and *C albicans* coinfection, carried along with the fish bone which from the esophagus penetrated into the left atrium. Foreign bodies of the upper digestive tract can cause complications including perforation of the esophagus, migration into the adjacent organs, and abscesses formation. But penetrating into the heart is rare and potential fatal. This rare possibility should be kept in mind in all acute IE cases.

Accidental penetrating foreign body endocarditis is rare but potential curable. We describe a unique case of acute endocarditis and systematic embolization due to *G adiacens* and *C albicans* coinfection caused by a fish bone penetrating through the thoracic esophagus into the heart. According to IE cases caused by a foreign body of the upper digestive tract, we should pay attention to pathogens originating from the upper digestive tract such as NVS and candida. This fatal infection is potential curable with timely operation and effective antimicrobial therapy.

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