BACKGROUND:
The trial of pneumonia, meningitis and endocarditis secondary to Streptococcus pneumoniae was first described by Heisch in 1862 followed by Osier in 1881. In 1956, Austrian described a case series of 8 patients with pneumococcal endocarditis and rupture of the aortic valve. This trial became known as the Austrian syndrome. We present what we believe to be the first reported case of Austrian syndrome with quadruple heart valve involvement, and review the literature detailed cases of quadruple valve infective endocarditis.

CASE AND METHODS:
- A 54-year-old male male non-tetral, presented to our hospital with a two-week history of fever, cough and headache.
- He had no past medical history and denied intravenous drug abuse.
- Clinical examination revealed an early diastolic cardiac murmur with basal crackles in the left lung. 
- Chest radiograph and computed tomography scan revealed left lower lobe broncho pneumonitis (Figure 1).
- He was admitted on intravenous antibiotics.
- Repeated blood cultures were non-yielding.
- A transesophageal echocardiography showed vegetations involving both the mitral and aortic valves, with aortic regurgitation.
- On the fourth day of hospitalization, he developed right upper lobe weakness and two episodes of generalized tonic-clonic seizures.
- Magnetic resonance imaging of the brain revealed leptomeningeal enhancement, as well as cortical infections in the left temporal and parietal lobes (Figure 2).
- A lumbar puncture performed was bioethically consistent with meningitis (Table 1). Bacterial gram stain and culture were negative.
- Urinary Streptococcus pneumoniae antigen was negative but cerebrospinal fluid Streptococcal pneumococcal meningitis was positive. 
- A diagnosis of Austrian syndrome with septice brain embolus was made. 
- Antimicrobial therapy was switched to meningial doses of vancomycin and ceftriaxone.
- A transesophageal echocardiography (Figure 3) showed quadruple valve endocarditis, complicated by aortic valvular perforation and regurgitation, as well as the presence of a small septum interventricular defect.
- He was planned for surgery but unfortunately developed multi-organ failure and passed away.

A computerized PubMed search for reports of quadruple valve infective endocarditis was conducted for the literature review. References from each of the articles obtained by these searches were also reviewed for relevant case reports. Only reports available in English were included.

We present our case along with the other case reports in Table 2.

RESULTS:
A total of 19 cases were available, including our patient. The mean age of presentation was 48.3 years, with a range from 7 to 82 years. There were more men (11/19) than women (8.5%). Four patients had a history of intravenous drug abuse, another four had underlying congenital heart disease and one had both. Two patients (10.5%) had two microorganisms isolated. Staphylococcus aureus (S. aureus) (three cases, 15.8%) each were the most commonly implicated microorganism. Heart failure was the commonest complication, afflicting eight patients (42.1%). Eight patients (42.1%) underwent surgical. Overall, ten patients died, giving a case fatality rate of 52.6%. Cardiac surgery was of borderline significance in predicting survival (p = 0.054). Endocarditis was diagnosed only at post-mortem in two cases (10.5%).

CONCLUSION:
We report the case of quadruple valve infective endocarditis secondary to Streptococcus pneumoniae, occurring in a patient with Austrian syndrome and newly diagnosed ventricular septal defect. Risk factors for quadruple valve infective endocarditis include congenital heart disease and intravenous drug abuse. Clinicians need to remain vigilant in the presence of these risk factors.

REFERENCES: