Case report

H1N1 infection in emergency surgery: A cautionary tale

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A previously healthy 31-year-old male presented to the emergency department complaining of anorexia and lower abdominal pain for the previous 12 h. There was associated nausea but no vomiting or diarrhea. Review of systems was normal with no recent cough, shortness of breath or coryzal type symptoms. Examination revealed tenderness and guarding in the right iliac fossa with a normal chest examination. Routine blood tests were normal apart from a decreased lymphocyte count of 0.9 × 10 9/L (normal range 1–4 × 10 9/L). Plain radiograph of his chest was normal (Fig. 1). He was commenced on intravenous broad-spectrum antibiotics and taken to theatre for open appendicectomy. A Gridiron approach was undertaken which revealed an inflamed suppurative appendix. This was removed and a thorough washout was performed before closure.

On his first post-operative day he had a dry cough and low grade pyrexia. His lymphocyte count was further reduced to 0.6 × 10 9/L. Day 2 post-operatively he had a worsening cough and 3 episodes of vomiting. He had a marked pyrexia of 38.8°C. Auscultation of his chest revealed bibasal crepitations which were worse on the right. His abdomen was soft and non-tender. Day 3 post-operatively his respiratory function disimproved markedly. His cough had worsened and he continued vomiting. His abdomen remained soft but now he had reduced breath sounds at right base and diffuse crepitations. A chest X-ray revealed bilateral infiltrates and an extensive right sided effusion (Fig. 2). Arterial Blood Gas analysis on room air showed severe hypoxia with a partial pressure of oxygen of 6.5 kPa (normal range 10.0–13.0 kPa) and a respiratory acidosis (pH 7.23). Aspiration pneumonia or pulmonary embolism (PE) were suspected. Intravenous piperacillin with tazobactam and therapeutic enoxaparin were commenced empirically. An ultrasound scan of his abdomen was normal. Computed Tomography Pulmonary Angiography revealed the same bilateral inflammations and right sided effusion seen on the chest radiograph but no PE (Fig. 3).

Day 4 post-operatively, a nasal swab tested with real-time reverse transcription-polymerase chain reaction (RT-PCR) was positive for H1N1 infection. Treatment with high dose oseltamivir was immediately added to the initial empirical antibacterial therapy. He rapidly progressed to acute respiratory distress syndrome (ARDS) (Fig. 4) with refractory hypoxaemia and was transferred to the intensive care unit for ventilation on an oscillator. He required mechanical ventilation for a total of 32 days and was discharged from ICU 54 days post-operatively. The histology of the appendix confirmed acute appendicitis.

1. Discussion

Pandemic 2009 influenza A H1N1, a triple-reassortant swine influenza, has spread rapidly since its first report in Mexico in March 2009. This is the first influenza pandemic in over 40 years and it atypically affects previously healthy young adults, with higher rates of morbidity and mortality. The medical literature has been inundated with reports of H1N1 infection, the majority found in critical care and internal medicine journals with a relative paucity in the surgical literature. Despite this, it remains an important entity that can impact greatly on acute surgical emergencies. We present a case of previously healthy 31-year-old male who underwent open appendicectomy. His post-operative recovery was complicated by acute respiratory distress syndrome secondary to H1N1 infection. This case report highlights the impact that H1N1 virus can have on acute surgical emergencies and how it can complicate the post-operative course.
ature has been inundated with articles relating to epidemiological characteristics, medical treatment, diagnosis and outcomes. Much of this published work is found in critical care and internal medicine journals with a relative paucity in the surgical literature.

Surgeons encounter this problem in a less obvious way than their medical and critical care counterparts, due to the nature of their work. Despite this, it remains an important entity that can impact greatly on an acute surgical service. Concerns relating to limitation of resources for surgical patients have been raised, such as the availability of respirators and intensive care unit beds. Person et al. in a recent article highlighted, in a more direct fashion, the devastating effects that H1N1 infection can have on an acute surgical service. They present 3 cases where H1N1 confounded the clinical course of an acute surgical emergency including an epidural haematoma, bowel necrosis secondary to adhesions and a necrotizing skin infection. In contrast to our case, all of these patients had severe respiratory dysfunction resulting from H1N1 infection prior to onset of their surgical complaint. In our case our patient was completely asymptomatic from a respiratory viewpoint until 24 h post-operatively. As symptoms only became apparent post-operatively this caused us to focus on common post-operative causes of respiratory dysfunction such as aspiration pneumonia and pulmonary embolism. The difficulty in diagnosis resulted in a delay in the administration of anti-virals until features of severe respiratory failure had manifest.

This case also raises some interesting issues relating to diagnosis and management. We accepted that our patient had contracted H1N1 prior to admission as his lymphocyte count was low, it being the predominant haematological abnormality in H1N1 infection. Also, the reported incubation time is from 2 to 7 days making it highly unlikely that he had contracted it the post-operative setting. Despite this he was asymptomatic from a respiratory...
point of view with a normal chest radiograph on admission. This would have made diagnosis of this on clinical grounds difficult pre-operatively. Even if H1N1 infection is suspected pre-operatively, one has to question if an appendicectomy be safely put off until diagnosis is established. Similarly, there is uncertainty whether the severe respiratory distress that accompanied this man’s H1N1 infection was in some way exacerbated by his general anaesthetic and appendicectomy. It is possible that he destined to have such a turbulent clinical course regardless of this procedure. In this case it would seem that the deterioration in respiratory function was indeed provoked by his procedure. General anaesthesia has been recognised to have negative impact on the course of influenza virus infections. However, in this case it would be difficult to justify not taking a patient with an obvious acute appendicitis to theatre on the basis of a low lymphocyte count.

In conclusion, this case report highlights the impact that H1N1 virus can have on acute surgical emergencies and how it can complicate the post-operative course.

**Conflicts of interest statement**

None.

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None.

**Ethical approval statement**

Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

**References**