

# H1N1 vaccination: expect the unexpected

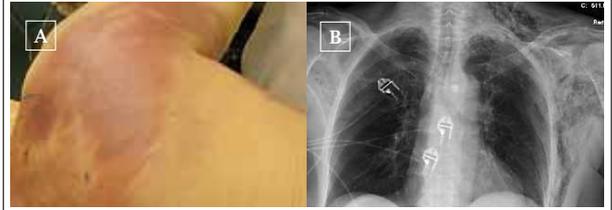
C. Popa<sup>1\*</sup>, P.C. Wever<sup>2</sup>, M. Moviat<sup>3</sup>

Departments of <sup>1</sup>Internal Medicine, <sup>2</sup>Medical Microbiology, <sup>3</sup>Intensive Care, Jeroen Bosch Hospital, 's-Hertogenbosch, the Netherlands, \*corresponding author: tel.: +31 (0) 24-361 88 19, fax: +31 (0)24-354 14 33, e-mail: c.popa@reuma.umcn.nl

## CASE REPORT

A 71-year-old woman presented to the emergency department of our hospital, three days after receiving the H1N1 influenza vaccine. She started feeling unwell one day after receiving the vaccine in her left forearm, complaining of abdominal pain and nausea (without vomiting). On the day of presentation she developed fever, rapidly progressive pain in the left shoulder and blurred speech. Further history revealed a depressive disorder and oesophageal stenosis as a result of corrosive ingestion. Her medication comprised only lithium and pantoprazole. At presentation in the emergency room, we saw a severely ill patient with a blood pressure of 100/70 mmHg, a pulse rate of 120 beats/min and a temperature of 38.2 °C. The patient was in severe respiratory distress. Although the physical examination of her left shoulder region by her general practitioner, two hours before presentation was unremarkable, we observed oedematous, discoloured skin and crepitus, extending from the left shoulder (*figure 1A*). Laboratory analysis revealed a procalcitonin of 52.7 ng/ml and a C-reactive protein of 305 mg/l. Chest X-ray showed extensive subcutaneous emphysema (*figure 1B*).

**Figure 1.** [A] A blue line is marking the edge of skin lesions at presentation. These skin lesions are on the contralateral side of the initial left shoulder lesion. [B] Chest X-ray revealing subcutaneous emphysema at the left shoulder site.



## WHAT IS YOUR DIAGNOSIS?

See page 246 for the answer to this photo quiz.

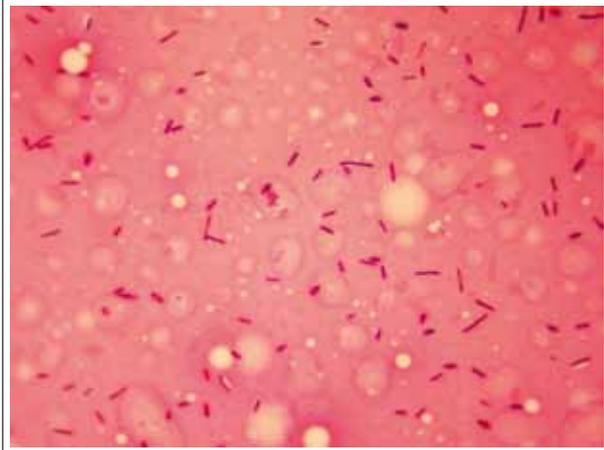
## DIAGNOSIS

The presence of septic shock manifestations and rapidly progressive skin changes raised the suspicion of necrotising soft-tissue infection. Antibiotic therapy was immediately initiated with flucloxacillin, clindamycin and ciprofloxacin. Our diagnosis was confirmed during an acute surgical exploration, indicating extensive soft tissue necrosis spreading from the left arm to the back and the contralateral side. Complete debridement was judged impossible. Because of progressive septic shock and lack of treatment options, therapy was discontinued. The patient died several hours after presentation. Microbiological examination of blood and tissue cultures identified *Clostridium septicum* as the sole aetiological microorganism (figure 2).

Life-threatening skin and soft-tissue infections (SSTIs) are infrequent and difficult to diagnose. Among gas-forming SSTIs, the pathogens most frequently responsible are *Clostridium* species.<sup>1</sup> Gas gangrene due to *Clostridium perfringens* or *C. septicum* following subcutaneous or

intramuscular injection has infrequently been reported.<sup>2</sup> Our patient's history was unremarkable, apart from the depressive disorder. Particularly, there was no evidence of colorectal cancer or a compromised immune system. Although the initial abdominal pain and nausea in our patient might suggest an intestinal focus, it is more likely that they result from release of clostridial toxins, which has been related to gastrointestinal symptoms.<sup>3</sup> In our patient, fatal gas gangrene of the left shoulder developed three days after intramuscular injection of the H1N1 influenza vaccine in the left forearm, suggesting a causative association. This is further supported by an essentially similar case reported previously.<sup>4</sup> Presumably, in these cases clostridial spores infect muscle tissue where the response to vaccination favours relative hypoxia in which anaerobic *Clostridium* species can thrive.<sup>2</sup> Our report emphasises the fulminant evolution of gas gangrene and adds influenza vaccination to the list of conditions associated with the risk of gas gangrene development. At the same time, this is the first report on fatal *C. septicum* gas gangrene in an individual who received the H1N1 influenza vaccine.

**Figure 2.** Gram-staining of a specimen taken from the skin during the surgical exploration showing the presence of *Clostridium septicum* at the site of gangrene



## REFERENCES

1. Stevens DL, Troyer BE, Merick DT, et al. Lethal effects and cardiovascular effects of purified alpha- and theta-toxins from *Clostridium perfringens*. *J Infect Dis*. 1998;157:272-9.
2. Chin RL, Martinez R, Garmel G. Gas gangrene from subcutaneous insulin administration. *Am J Emerg Med*. 1993;11:622-5.
3. Popoff MR, Bouvet P. Clostridial toxins. *Future Microbiol*. 2009; 4:1021-64.
4. Thomas MG. *Clostridium septicum* gas gangrene following intramuscular infection from an influenza vaccine booster. *Br J Clin Pract*. 1990;44:709-10.