

## Nearly drowned – why?

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**Emergencies can spring up at any time and in many incarnations. Are you adequately equipped to deal with them? Each month we present a case study in emergency medicine based on real cases and events. Would you have been able to help this patient?**

One of the reasons GPs love their shifts in the emergency department is that some of the patients are so difficult and complex yet so exciting – just like on the TV dramas.

### A case of near drowning

The ‘bat phone’ rings, with the ambulance officers informing the emergency department that they are bringing in a critically ill patient who was retrieved from Sydney Harbour. The trauma team is assembled, as often these patients will have jumped into the water and sustained some traumatic injury, especially when they are found near the Harbour Bridge.

### Retrieval from the water

Apparently the patient had been spotted floating in the water, unresponsive, face up, with her head banging against a raised rock wall. The water police had fished her out because there was no way of reaching her from the shore. The police thought they were retrieving a dead body but when they realised the person was alive they arranged for an ambulance and a quick response paramedic motorcycle (that would not get stuck in city traffic) to be waiting for them at the shore.

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### The ambulance patient report

The report from the ambulance officers, handed over after the patient had been transferred to the trauma bed in the emergency department, indicated the patient, a woman in her late 50s, had been spontaneously breathing and had a decreased level of consciousness when she was pulled from the water. The paramedic further noted a decreased respiratory rate of eight breaths per minute. The patient had felt very cold with no peripheral pulses palpable, and therefore her blood pressure had not been taken. Initial Glasgow coma scale scores at the scene were 3/15 (best verbal response 1, best motor response 1, eye opening 1). By the time of transfer to hospital this had improved to 7/15 (verbal 2, motor 4, eye 1). Auscultation of the chest seemed clear and there was no obvious sign of trauma. However, following correct procedure, a neck collar was put on.

On the way to hospital, the patient was put in the left lateral position and wrapped in a space blanket and normal blankets. She tolerated an oropharyngeal airway (Guedel), and improved a little neurologically.

The ambulance cardiac monitor strip showed a profound bradycardia and an abnormal QRS complex (Figure 1).

### Hypothermia a problem

By this time the trauma team attending the patient was getting its own observations – pulse 40, atrial fibrillation, blood pressure 80/40 mmHg, and pulse oximetry 80% (although this is unreliable in a peripherally shutdown patient).

After a little while the rectal core temperature was recorded at 25°C, indicating severe hypothermia. However, before this was known, the patient was carefully log rolled as part of the examination to look at the whole patient, especially the back. (If the back is not examined early in the work-up, it will often not be looked at for a long time, especially if the supine patient is critically ill. Bruising and injuries of the spine, back of the head, back of the trunk and legs are then missed.) During the log roll the patient went into ventricular fibrillation: with a minimum of fuss she was quickly and successfully defibrillated with a single shock of 200 joules. A very cautious, gentle endotracheal intubation quickly followed, using a rapid sequence technique that omitted the thiopentone

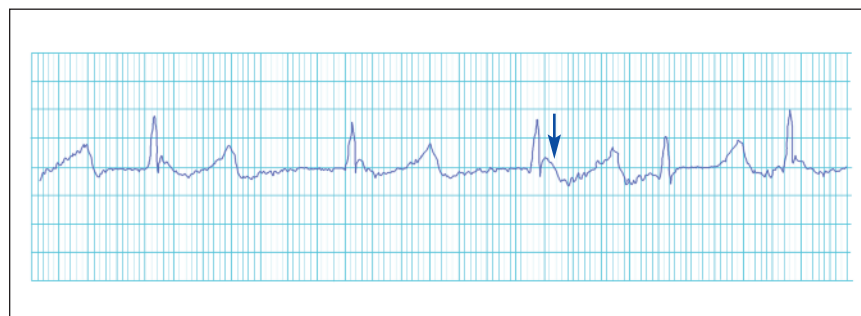


Figure 1. ECG showing the Osborne J waves (arrowed) classically associated with severe hypothermia.

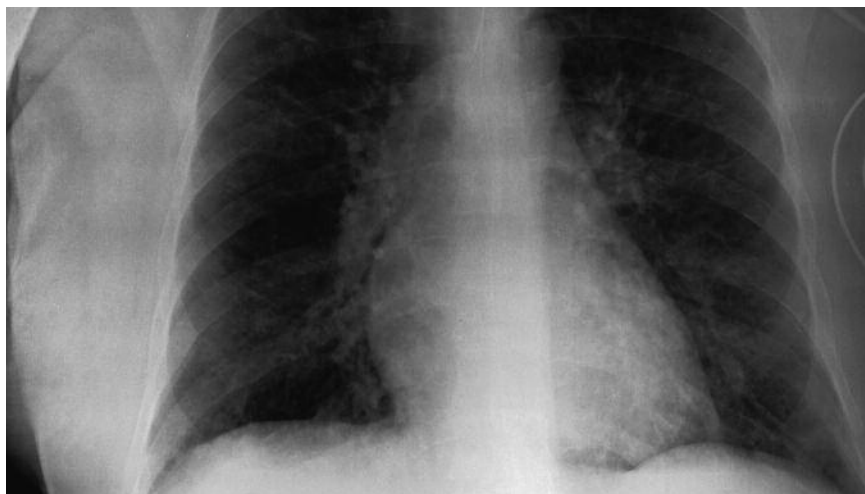


Figure 2. Pulmonary oedema may occur up to 24 hours after the incident in conscious drowning patients.

(which should not be used if the patient is hypotensive).

The profound hypothermia was now being treated with warmed intravenous fluids – polygeline solution (Haemaccel) and Hartmans. The patient was also placed in a warm air patient tube (Bair Hugger), and warm packs were placed in the axillae and groins.

Of course, everybody now recognised the Osbourne J waves that were clearly evident on the ambulance cardiac trace and which are pathognomonic of hypothermia (see Figure 1).

### Further investigation

Meticulous physiological support is the cornerstone of management for all cases of drowning. There is no functional difference in the management of cases of salt water and fresh water drowning or of 'dry' (very little water aspirated) or 'wet' (a significant amount of water aspirated) drowning.

The physical examination had revealed some abrasions on the patient's back and back of her head. Although her Glasgow coma scale was scored at 6/15 (verbal 1, motor 4, eye 1) with nonpurposeful movement of her upper limbs, there was no movement nor reflexes of

the lower limbs. She was biting on the Guedel's airway, her chest had bilateral coarse crepitations, and her abdomen was soft with an old midline scar.

With all the fears that any further stimulation or rough handling could put her again into refractory ventricular fibrillation due to the hypothermia, an IV line was gently put in (via the femoral vein). Arterial and other bloods were taken from the femoral vessels and rushed up to the laboratory. The results showed she was quite acidotic (pH 7.09, base excess -15), so she was given IV bicarbonate (50 mL of 8.4%).

Even the gentle insertion of the urinary catheter to monitor urine output gave more worries, revealing some bleeding from the vagina. This was presumed to be from the alleged jump, but a sexual assault was another possibility.

The patient was not given any steroids or prophylactic antibiotics as these have not been shown to be beneficial in the management of drowning.

There was no rest for the patient and the worried doctors. The chest x-ray now showed pulmonary oedema – presumed noncardiogenic but due to the immersion and aspiration (Figure 2).

A drug screen, pregnancy test, cervical

spine x-ray and head CT were organised. The head CT and cervical spine radiography were normal and the drug screen and pregnancy test were negative.

### Why had she tried to drown herself?

In the meantime, the social worker had done some detective work and found out from the patient's purse that she had a son in another city. The son said he had little contact with his mother but told us that she had a long psychiatric history of chronic schizophrenia and personality disorder and lived in a country town. There was also a history of noncompliance with medications. Exact details were obtained from her case manager. It seemed that the patient had had an argument with other residents of the group home where she was living and had taken herself to Sydney where she had jumped into the harbour.

### Discharge after five days

With a lot of concern still, the patient was transferred to intensive care and kept on positive end-expiratory pressure ventilation of +5 cm of H<sub>2</sub>O.

On your next shift the following week, you enquire about the patient's clinical course and details. Apparently, she recovered quickly in intensive care and was extubated a day later. The mainstays of therapy were antibiotics and chest physiotherapy for a chest infection and psychiatric treatment. She tolerated the risperidone (Risperdal) well and was discharged home only five days after she had jumped with no more suicidal ideation or any complications.

### This patient survived, others don't

You are amazed how well this patient did given how ill she was initially. The enigma of confidently predicting how well or badly a patient will do even with optimal care is puzzled over with colleagues during a coffee break. **MT**