



*Emergency
Care Institute*
NEW SOUTH WALES



ACI NSW Agency
for Clinical
Innovation

OFF THE TRACK

Learning from our Incidents:
RED FLAGS in the Emergency Department



The case

A 42 year old male presented to ED with lower back pain following referral from Opioid Treatment Program (OTP) clinic.

History of intravenous drug use (IVDU), though patient denied current use whilst on the OTP.

The patient was assigned triage category 4 and noted to be a poor historian and denied taking any analgesia prior to presentation.

The case

At the time of arrival:

- *BP 121/65mmHg*
- *HR 118/min*
- *RR 20/min*
- *SaO₂ 100% on room air*
- *T35.4C*

Which features of the patient's presentation are the Red Flags indicating a high risk of serious disease?

The case

Following assessment by a medical officer, patient given provisional diagnosis of mechanical back pain.

Oral analgesia administered with good effect. Patient able to stand and mobilise normally, and discharged home in the care of his partner.

The case

Twelve days later, patient brought in by ambulance to ED after his partner noted patient to have become unwell and increasingly verbally abusive since the previous ED presentation.

The case

Vital signs on arrival:

- *BP 122/63mmHg*
- *HR 115/min*
- *RR 22/min*
- *SaO₂ 96% on room air*
- *T 36.2C*

Noted at triage to be agitated, talking irrationally, unable to give any medical history.

What are your differential diagnoses?

The case

An intern assessed the patient and found him to appear dehydrated with overall impression being ongoing back pain and dehydration.

Intravenous fluids administered and ketorolac, paracetamol and Baclofen given with good effect.

Despite of further fluid resuscitation, patient's BP continued to fall, reaching 90/44.

What would you do now?

The case

As analgesia deemed to be effective, plan was to discharge patient home to continue analgesia.

Six hours after initial presentation and while patient waiting for pickup, patient had an unwitnessed fall in the corridor.

The case

Cannula re-inserted, blood collected for pathology, and further fluids administered. Noted that the patient was yet to pass urine since arriving in ED.

Blood results show high white cell count and elevated CRP (210).

The case

Nine hours after initial presentation, patient noted to be more agitated and now thrashing and moaning in his bed. He reported feeling like he could not breathe.

Shortly after, he went on to suffer a cardiorespiratory arrest. CPR was commenced, which successfully revived the patient only for him to arrest again shortly after.

The case

CPR was unsuccessful and the death referred to the coroner.

The post mortem revealed the cause to death:
massive pulmonary embolism with an aortic valve rupture secondary to abscess due to infective endocarditis.

What is the lesson here?

For any patient with a history of IVDU, consider less common diagnoses: endocarditis, skin lesions, and epidural abscesses.



What's the evidence?

- **Intravenous drug users (IVDUs) exhibit distinct patterns of healthcare utilisation.** In their study, O'Connor et al.¹ demonstrated that emergency departments provide the majority of acute care to this patient population.
- For IVDUs, many infections such as infective endocarditis (IE) and spinal epidural abscess (SEA) present with nonspecific or atypical symptoms that make localisation of the source difficult.²
- The most common symptom of IE is fever. Other nonspecific constitutional symptoms include myalgias, generalised weakness, night sweats, anorexia and joint pain. For SEA patients, the most common complaint is back pain, another nonspecific finding.

What's the evidence?

- **Infective endocarditis (IE)** is a relatively frequent and severe complication of IVDU. IE has an incidence of 1 to 20 cases per 10 000 IVDUs every year and accounts for 5% to 20% of hospital admissions in this population. Accurate diagnosis of IE is important given the severity of associated complications and a significant mortality rate (5% to 10%).³
- The diagnosis is often elusive in this population. One of the major controversies regarding IE is making the diagnosis in predisposed patients who do not have classic findings. IVDUs tend to have acute staphylococcal disease, a process that does not allow adequate time for development of immunologic and other extra-cardiac manifestations⁴.

What's the evidence?

Spinal epidural abscess

- IVDU is one of the primary risk factors for SEA².
- IVDU diagnosed with SEA are younger than non-IVDU patients. Because of their younger age, nonspecific symptoms and signs, and delayed findings on plain films, delay in diagnosis is common.⁵
- Clinical findings suggestive of SEA include neurologic deficit with back or neck pain, fever or elevated ESR, severe back or neck pain with or without fever, severe back or neck pain with elevated ESR.⁶

What's the evidence?

- Some patients with SEA have a more chronic course over weeks to months, whereas others have rapid progression to permanent disability, presumably as a complication of spinal cord compression and infarction secondary to local vessel thrombosis².
- Patients with acute disease are likely to be ill-appearing, febrile, and possibly disoriented, but some patients are normothermic or have only low-grade temperature elevation, even in the setting of acute disease.
- Altered mental status or encephalopathy occurs in up to 20% of patients and can obscure the diagnosis.²

What's the evidence?

- **Skin and soft-tissue infections** are some of the most common infections among injection-drug users. Abscesses are one of the most common reasons that the IVDU presents to the ED for evaluation.
- Emergency clinicians must be aware of the morbidity and complications associated with the “shooter’s abscess” and be able to recognise promptly which patients require surgical consultation and treatment⁷.

References

1. O'Connor, G., McGinty, T., Yeung, S.J. O'Shea, D., Macken, A., Brazil, E., Mallon, P. *Cross-sectional study of the characteristics, healthcare usage, morbidity and mortality of injecting drug users attending an inner city emergency department*. *Emergency Medicine Journal*, 2014. 31: pp.625–629.
2. Calder, K.K., Severyn, F.A. *Surgical emergencies in the intravenous drug user*. *Emergency Medicine Clinics of North America*, 2003. 21: pp. 1089-1116.
3. Chung-Esaki, H., Rodriguez, R.M., Alter, H., Cisse, B. *Validation of a prediction rule for endocarditis in febrile injection drug users*. *American Journal of Emergency Medicine*, 2014. 32(5): pp. 412-416.
4. Bayer, A.S., Bolger, A.F., Taubert, K.A. et al. *Diagnosis and management of infective endocarditis and its complications*. *Circulation*, 1998. 98(25): pp. 2936–2948.
5. Chuo, C.Y., Fu, Y.C., Lu, Y.M., Chen, J.C., Shen, W.J., Yang, C.H., Chen, C.Y. *Spinal infection in intravenous drug abusers*. *Journal of Spinal Disorders & Techniques*, 2007. 20(4): pp. 324-328.
6. Rigamonti, D., Liem, L., Sampath, P. et al. *Spinal epidural abscess: contemporary trends in etiology, evaluation, and management*. *Surgical Neurology*, 1999. 52: pp. 189–197.
7. Gordon, R.J., Lowy, F.D. *Bacterial Infections in Drug Users*. *New England Journal of Medicine*, 2005. 353: pp. 1945-1954.

Another case

A 59yo female presented to ED complaining of neck and back pain, with pins and needles in her left hand.

Previous history of neck and back pain, asthma, non-STEMI, past IVDU, cirrhosis, hepatitis C.

Another case

The patient was reviewed by a medical officer and noted to be tachycardic with a potential mild heart murmur.

The patient reported that her lower back pain had been progressively worsening over a week and that she was experiencing sweats, chills, rigors, frontal headaches, and pins and needles in both feet.

Another case

Paraesthesia had resolved at time of review, however an altered gait was noted. Nil neurological deficits on physical examination, but spinal tenderness present.

Radiological investigations did not demonstrate acute pathology.

Provisional diagnosis of musculoskeletal neck and back pain.

Another case

Transferred to Emergency Short Stay Unit for overnight admission, with a plan for physiotherapy review in the morning.

The next morning, patient assessed by physiotherapist and cleared for discharge with a suggested plan to follow up with Pain Clinic. Nil further neurological symptoms and pain was well-controlled at this time.

Another case

Prior to the patient leaving the department, the patient was found to have developed left-sided weakness with increasing drowsiness and GCS 11. Transferred immediately to the resuscitation bay.

*Following stabilisation, a CT Brain showed **right middle cerebral artery (MCA) infarct.***

Another case

Patient promptly assessed by Stroke team who on detecting a heart murmur, raised the suspicion of infective endocarditis.

Patient continued to deteriorate further, requiring intubation and transfer to ICU for ongoing management. Intravenous antibiotics initiated by Infectious Diseases team to cover bacterial endocarditis.

Another case

*A transoesophageal echocardiogram was performed several days later, demonstrating **tricuspid endocarditis with moderate regurgitation.***

With ongoing clinical deterioration, a CT Brain performed two weeks after initial presentation demonstrated haemorrhagic transformation of the right MCA infarct with increased mass effect.

Another case

Following discussion of the findings and prognosis with the patient's family, a decision was made to extubate the patient. She passed away three days later.

For any patient with a history of IVDU, consider less common diagnoses: endocarditis, skin lesions, and epidural abscesses.

Published Jul 2021. Next review 2026. © State of NSW (Agency for Clinical Innovation) CC-ND-BY