

ANZASM Case of the Month November 2024 Edition

(case selected by the ANZASM Committee for your information)

Delayed diagnosis and treatment of periprosthetic joint infection

General Surgery

Case summary

A woman aged 73 with type II diabetes mellitus and atrial fibrillation (on dabigatran) presented in the evening to a regional hospital. Her symptoms included a one-day history of knee pain with difficulty weight bearing. Nine years previously, she had had a total knee replacement, which was revised for infection.

On presentation, the patient was tachycardic but had no other signs of sepsis. The attending doctor was unsure but diagnosed a periprosthetic joint infection of the right knee. Blood tests showed raised inflammatory markers (white cell count $14.4 \times 10^9/L$; C-reactive protein 134 mg/L) and acute kidney injury (creatinine 124 mmol/L). An X-ray of the knee was normal. The joint was not aspirated, presumably due to concerns regarding sterility in the setting of a joint replacement. The patient was admitted to the short stay unit; dabigatran continued.

On day 2 post-presentation, an ultrasound showed a complex collection in the knee. The patient was discussed with Orthopaedics at hospital B and a transfer was advised for an aspirate. While awaiting transfer, the patient became febrile, hypotensive and tachycardic. Blood cultures were taken and intravenous (IV) flucloxacillin commenced. The patient was declared nil-by-mouth (NBM) and moved to the high dependency unit pending transfer. Transfer to hospital B did not occur until the evening.

The following morning, in the emergency department of hospital B, the orthopaedic consultant assessed the patient and aspirated 20 mL of knee joint fluid. Her NBM status continued pending the results of the aspirate.

The patient did not go to theatre on the day of presentation at hospital B. There was a reluctance to take her to theatre because dabigatran had been administered the previous day. The haematologist advised waiting 48–72 hours before proceeding with surgery but also mentioned prothrombin complex concentrate as an option. There was no documentation regarding arranging polyethylene exchange implants at the time of surgery. It is unclear at what point the patient was fed. Multiple medical emergency team (MET) calls for hypotension occurred throughout the evening and the patient was transferred to the intensive care unit (ICU).

The following afternoon (3 days from the initial presentation), the patient was taken to theatre for a washout. A polyethylene exchange was not performed. Copious frank pus was found in the knee. The patient remained in ICU and the wound continued to ooze. A repeat washout was performed 5 days after the first washout. No frank pus was seen.

The patient's condition failed to improve. Infective endocarditis was suspected, but not proven on transthoracic echocardiogram. A transoesophageal echocardiogram was planned but postponed because an upper gastrointestinal bleed developed. The patient continued to deteriorate.

The patient died 14 days after admission to hospital B. The cause of death was stated as upper gastrointestinal bleed secondary to *Staphylococcus* sepsis and endocarditis.

Discussion

Given the constellation of signs, symptoms and investigations at presentation, a diagnosis of periprosthetic joint infection was extremely likely. Preparations should have been made to have the patient transferred to hospital B for surgery. This includes ceasing dabigatran.

When the patient became hypotensive, the receiving orthopaedic team could have considered advising the treating team to aspirate the knee before commencing IV antibiotics. At this point, concerns regarding introducing infection are outweighed by the need to identify an organism prior to antibiotic therapy.

The patient was not taken to theatre on the day of presentation to hospital B. This may have been due to concerns regarding bleeding on the background of dabigatran. Suspicion of infection should have been present at this stage, given the patient's previous history of infected knee replacement and signs of sepsis. This should outweigh concerns of bleeding in most circumstances.

It is routine practice to exchange components that can be easily removed when washing out a joint replacement for infection. This usually allows a more thorough debridement and source control.

Clinical lessons

This patient endured a long period of time from presentation to source control of sepsis due to a combination of delay in diagnosis, delay in transfer and delay in surgical washout/debridement.

The delayed debridement could have been optimised by polyethylene exchange. This delay may have contributed to secondary infection such as endocarditis, which may have contributed significantly to the patient's death.