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Multidisciplinary Perioperative Management of Type 2 Diabetes, Respiratory Infection, and Femoral Fracture: A Case Report

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Abstract

Perioperative care is complex when diabetes, obesity, hypertension, respiratory symptoms, anaemia, and orthopaedic trauma coexist. A 61-year-old woman with inconsistently treated type 2 diabetes presented after a fall with a right femoral fracture, random glucose of 207 mg/dL, blood pressure of 160/90 mmHg, pulse of 104 beats/min, BMI of 31.2 kg/m2, dyspnoea, and bilateral adventitious breath sounds. SARS-CoV-2 IgG was positive, but later PCR was negative; serology did not establish active COVID-19 or a post-COVID syndrome. Management included glucose monitoring and insulin titration, respiratory treatment, open reduction and internal fixation, transfusion for postoperative anaemia, and anticoagulation in the setting of surgery and elevated D-dimer. Clinical status improved before discharge. The report highlights coordinated metabolic, respiratory, surgical, and thrombosis-risk management while emphasizing that D-dimer alone does not diagnose coagulopathy or venous thromboembolism. Fracture classification, diagnostic tests, medication doses, transfusion details, anticoagulation indication, and consent require verification.

Keywords: type 2 diabetes mellitus; perioperative glycaemic management; femoral fracture; respiratory infection; D-dimer; anticoagulation

Introduction

Hospitalization, acute infection, trauma, and surgery can increase counter-regulatory hormones and insulin requirements, making glycaemic management difficult in patients with type 2 diabetes mellitus (T2DM) (1,2). Orthopaedic trauma adds risks related to immobility, thrombosis, infection, and rehabilitation, which require coordinated perioperative planning.

Hyperglycaemia is associated with impaired host defence and wound healing, but inpatient targets and insulin regimens must be individualized to nutrition, renal function, operative timing, and hypoglycaemia risk. Fracture location, prior fixation, soft-tissue status, and operative details are also essential for interpreting outcome (3,4).

Obesity and hypertension increase cardiometabolic and anaesthetic risk. An elevated D-dimer may accompany trauma, inflammation, infection, age, and the postoperative state; it is not, by itself, evidence of coagulopathy or venous thromboembolism. Decisions about prophylactic or therapeutic anticoagulation should be linked to clinical probability, imaging when indicated, bleeding risk, renal function, and the operative plan.

Respiratory symptoms and bilateral adventitious sounds warrant assessment for pneumonia, pulmonary oedema, atelectasis, and viral infection. SARS-CoV-2 antibody positivity reflects prior immune exposure and cannot diagnose current infection; current infection is assessed with viral testing interpreted in the clinical context (6).

Rapid-acting insulin was used during admission, and azithromycin and oseltamivir were reported in the medication history. Oseltamivir is an antiviral active against influenza, not an antibiotic, and its indication should be supported by suspected or confirmed influenza exposure. Medication names alone cannot establish efficacy without dose, timing, diagnostic rationale, and concurrent supportive care. This case describes multidisciplinary perioperative management of T2DM, respiratory illness, and a femoral fracture. The revised report separates observed findings from unverified diagnoses and identifies the source data required for a reproducible clinical account.

Case Presentation

A 61-year-old Javanese woman presented after a fall with right-leg pain, inability to stand, and visible deformity. She reported mild dyspnoea and had undergone surgery for a right femoral fracture approximately one year earlier. T2DM had been diagnosed six months before presentation, but treatment had been inconsistent. Examination documented blood pressure of 160/90 mmHg, pulse of 104 beats/min, BMI of 31.2 kg/m2, and bilateral adventitious breath sounds. Random blood glucose was 207 mg/dL; anaemia was described qualitatively; and SARS-CoV-2 IgG was positive. Radiography was reported as showing a closed right femoral fracture, although the phrase 'medial femur' does not provide an accepted anatomical classification.

Inpatient management included glucose monitoring with subcutaneous insulin glulisine, vitamin supplementation, azithromycin, and oseltamivir. Open reduction and internal fixation was planned for hospital day 4. Anticoagulation was initiated after an elevated D-dimer was reported in the setting of trauma, immobility, and planned surgery. The available record does not clarify whether the anticoagulant was prophylactic or therapeutic or whether venous thromboembolism was investigated.

On postoperative day 5, the patient was haemodynamically stable but haemoglobin was reported as 8, prompting transfusion. Glucose remained elevated initially and improved with serial monitoring and insulin titration. Respiratory symptoms were reported to improve by day 6, and SARS-CoV-2 PCR was negative. No objective chest-imaging result, oxygen-saturation trend, respiratory culture, or influenza test is provided.

By hospital day 13, the clinical notes described improvement in respiratory symptoms, anaemia, and glycaemic control. Anticoagulation was changed from fondaparinux to oral rivaroxaban after the D-dimer decreased. The patient was discharged on day 14 with insulin, anticoagulation, glucose monitoring, and outpatient follow-up. The rationale, dose, duration, and monitoring plan for post-discharge anticoagulation require confirmation.

[AUTHOR VERIFICATION REQUIRED: provide the exact fracture site and classification, prior implant status, operative findings and fixation method; HbA1c and serial glucose values; haemoglobin units, transfusion threshold, number of units, and post-transfusion value; exact D-dimer values and units, platelet count, PT/INR, aPTT, fibrinogen, renal function, bleeding assessment, and any VTE imaging; oxygen saturation, chest-imaging findings, microbiological tests, and final respiratory diagnosis; all drug doses, routes, dates, and indications; rehabilitation and follow-up outcomes; and written consent/ethics documentation.]

Discussion

The central management problem was perioperative metabolic instability in a patient with recent, inconsistently treated T2DM. Trauma, respiratory illness, fasting, and surgery can all increase glucose variability. Frequent point-of-care measurement and insulin titration were therefore clinically plausible, but the manuscript requires HbA1c, serial glucose values, nutrition status, renal function, insulin doses, and hypoglycaemic events to allow assessment of quality and safety (1,2).

The respiratory episode should not be labelled post-COVID on the basis of positive IgG. Antibody tests cannot diagnose current SARS-CoV-2 infection, and a negative PCR later in admission does not identify the cause of earlier symptoms (6). Bronchopneumonia likewise requires supporting clinical and radiological evidence. Improvement after treatment is temporally associated with care but cannot establish that azithromycin or oseltamivir was responsible.

The fracture, immobility, obesity, and surgery increase venous-thromboembolism risk, but D-dimer is nonspecific after trauma and surgery. The report should distinguish standard postoperative

prophylaxis from treatment of confirmed or strongly suspected thrombosis. Without imaging or a documented clinical diagnosis, the terms coagulopathy, hypercoagulability, and post-COVID thrombosis are not supported.

Transition from fondaparinux to rivaroxaban may be appropriate in selected orthopaedic pathways, but interpretation requires dose, renal function, timing relative to surgery and neuraxial procedures, bleeding risk, indication, and planned duration. A falling D-dimer alone is not a validated basis for changing anticoagulant intensity.

The phrase 'right medial femur' is anatomically ambiguous. A publishable case should identify whether the injury involved the femoral neck, intertrochanteric or subtrochanteric region, shaft, distal metaphysis, or condyle; state whether it was periprosthetic or peri-implant; and report the accepted fracture classification and fixation method.

Postoperative haemoglobin of 8 was reported without units or the preoperative baseline. Transfusion decisions should be described in relation to symptoms, haemodynamic status, ongoing blood loss, comorbidity, and institutional thresholds. The earlier explanation of 'periprosthetic bone marrow loss' has been removed because it is not a recognized mechanism supported by the case data (7).

Azithromycin is an antibacterial macrolide; oseltamivir is an antiviral neuraminidase inhibitor used for influenza. Both agents require a documented diagnostic rationale, timing, route, and dose. Medication exposure should be reported accurately without inferring efficacy from subsequent clinical improvement (5).

A strength of the case is the documented coordination among medical, respiratory, anaesthetic, orthopaedic, nursing, and rehabilitation teams. The chronology also shows that glycaemic, respiratory, haematological, and thrombosis-risk decisions changed as the perioperative course evolved.

Major limitations are the absence of primary laboratory tables, imaging descriptions, operative detail, medication doses, and follow-up beyond discharge. These gaps prevent assessment of whether glycaemic targets were met, whether pneumonia or thrombosis was objectively confirmed, and whether the fracture healed without infection or mechanical complication.

The educational message is therefore conservative: complex perioperative care benefits from repeated reassessment and shared decision-making, while diagnostic labels and claims of treatment success must remain proportional to the documented evidence.

Conclusion

This case illustrates coordinated perioperative care for a patient with T2DM, obesity, hypertension, respiratory symptoms, postoperative anaemia, and a right femoral fracture. Glucose monitoring and insulin titration, fracture fixation, respiratory assessment, transfusion, thrombosis-risk management, and discharge planning were integrated over the admission. The available evidence does not establish active or post-COVID disease, coagulopathy, or venous thromboembolism; those labels have therefore been removed. Verification of the clinical source data, medication details, follow-up, and patient consent is required before publication.

Declarations

Author contributions: Aisyah Amalia: conceptualization, clinical data curation, and original draft. Rizky Patria Nevangga: metabolic and perioperative interpretation and critical revision. Nieke Andina Wijaya: clinical interpretation and manuscript revision. All authors approved the final manuscript.

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