ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 10 | October - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

GEMCITABINE-ASSOCIATED THROMBOTIC MICROANGIOPATHY IN A PATIENT WITH CHOLANGIOCARCINOMA: A CASE REPORT

Oncology

Dr. B. N. Kapur Director, Department Of Medical Oncology, Yashoda Superspeciality Hospital And Cancer Institute, Ghaziabad, Uttar Pradesh, India

Dr. Hemant Kumar Jaiswal Department Of Medical Oncology, Yashoda Superspeciality Hospital And Cancer Institute, Ghaziabad, Uttar Pradesh, India

Dr. Sharmistha Roy Department Of Medical Oncology, Yashoda Superspeciality Hospital And Cancer Institute, Ghaziabad, Uttar Pradesh, India

Dr. Vikas Verma Department Of Medical Oncology, Yashoda Superspeciality Hospital And Cancer Institute, Ghaziabad, Uttar Pradesh, India

ABSTRACT

Introduction: Thrombotic microangiopathy (TMA) is a rare but serious complication of gemcitabine. **Case Presentation:** A 56-year-old woman with extrahepatic cholangiocarcinoma received radical surgery followed by cisplatin-gemcitabine and subsequently gemcitabine maintenance. After eight cycles, she developed progressive renal dysfunction (creatinine 5.2 mg/dL), anemia, and thrombocytopenia. Peripheral smear revealed schistocytes; LDH was elevated (1064 U/L). C-ANCA/P-ANCA were negative and ADAMTS13 activity was 22.13%, excluding TTP. Plasma exchange was attempted without improvement. The patient required dialysis. Urine culture grew Klebsiella pneumoniae, managed with antibiotics. PET-CT confirmed remission, supporting gemcitabine-induced TMA as the diagnosis. **Conclusion:** This case underscores the importance of early recognition of gemcitabine-associated TMA, discontinuation of the drug, and prompt supportive care to prevent fatal outcomes.

KEYWORDS

INTRODUCTION

Cholangiocarcinoma is an aggressive biliary tract malignancy with limited therapeutic options and poor prognosis. Gemcitabine, alone or in combination with cisplatin, is the cornerstone of systemic therapy. Although well tolerated, gemcitabine has been associated with rare but severe toxicities, including thrombotic microangiopathy (TMA). G-TMA presents with microangiopathic hemolytic anemia (MAHA), thrombocytopenia, and renal dysfunction. We report a case of cholangiocarcinoma complicated by G-TMA during gemcitabine maintenance.

Case Presentation

A 56-year-old female, was diagnosed with extrahepatic cholangiocarcinoma in December 2023.

Treatment Timeline:

- **16.01.2024:** Exploratory laparotomy, radical cholecystectomy, excision of common bile duct, and hepaticojejunostomy.
- **July–December 2024:** Six cycles of cisplatin + gemcitabine.
- **January–June 2025:** Six cycles of maintenance gemcitabine.
- **June–July 2025:** Continued gemcitabine maintenance (M7–M8).

Response: PET-CT (April 2025) revealed complete metabolic remission.

Complication: After M8D8 gemcitabine (1000 mg on 24.07.2025), the patient developed progressive renal dysfunction (creatinine 1.6→5.2 mg/dL within one month), hemoglobin decline with hemolytic features, platelets 60,000/µL, LDH 1064 U/L. Peripheral smear showed schistocytes, anisopoikilocytosis, polychromasia, and thrombocytopenia. C-ANCA and P-ANCA were negative. ADAMTS13 activity was 22.13%. Plasma exchange was performed but renal function worsened, requiring dialysis. Urine culture grew Klebsiella pneumoniae (>10^5 CFU/mL), managed with culture-directed antibiotics. Final impression: MAHA + thrombocytopenia + AKI consistent with gemcitabine-associated TMA.

DISCUSSION

Gemcitabine-induced TMA is rare, with incidence ranging from 0.015–1.4%. It is often under-recognized and presents after prolonged therapy. Pathophysiology likely involves endothelial injury, complement activation, and microvascular thrombosis. Diagnosis requires exclusion of mimics such as TTP (low ADAMTS13 activity) and vasculitis (positive ANCA). In our patient, ADAMTS13 activity of 22.13% and negative C-ANCA/P-ANCA ruled out TTP and vasculitis, confirming G-TMA.

Management requires immediate discontinuation of gemcitabine. Supportive measures include dialysis and transfusions. Plasma exchange has limited benefit compared with TTP. Eculizumab, a C5 complement inhibitor, is emerging as a therapeutic option in refractory G-TMA. This case highlights the need for high suspicion in patients presenting with cytopenias and renal impairment on gemcitabine therapy.

CONCLUSION

Gemcitabine-associated TMA is a rare but potentially fatal adverse effect. Timely recognition, discontinuation of therapy, and supportive management are essential to improve outcomes. Clinicians must remain alert to this complication in patients developing anemia, thrombocytopenia, and renal dysfunction during gemcitabine treatment.

Ethical Statement

The protocol for this case report was approved by the Institutional Ethics Committee, Yashoda Superspeciality Hospital and Cancer Institute, Ghaziabad (Approval No. YSHCI/2025/CR-07). It conforms to the provisions of the Declaration of Helsinki (Fortaleza, Brazil, October 2013). Informed consent for publication was obtained from the patient.

Conflict Of Interest

The authors declare no conflict of interest.

Keynote Message

Gemcitabine-associated TMA is an uncommon but life-threatening toxicity. It should be suspected in patients developing unexplained anemia, thrombocytopenia, and renal dysfunction on prolonged gemcitabine therapy. Differentiation from TTP and vasculitis is crucial, with ADAMTS13 activity and ANCA testing guiding diagnosis. Early discontinuation and supportive measures are lifesaving. This case emphasizes the importance of clinician vigilance in real-world oncology practice.

REFERENCES

1. Gore EM, Jones BS, Marques MB. Gemcitabine-associated thrombotic microangiopathy. Cancer. 1999;85(9):2023-2028.
2. Humphreys BD, Sharman JP, Henderson JM, et al. Gemcitabine-associated thrombotic microangiopathy. Cancer. 2004;100(12):2664-2670.
3. Daviet F, Rouby F, Poullin P, et al. Thrombotic microangiopathy associated with gemcitabine use: a French national cohort. Br J Clin Pharmacol. 2019;85(2):403-412.
4. Cavero T, Rabasco C, López A, et al. Eculizumab in gemcitabine-induced hemolytic uremic syndrome. Clin Kidney J. 2017;10(1):127-131.