Acta Biomed 2025; Vol. 96, N. 6: 17277 DOI: 10.23750/abm.v96i6.17277

Case report

Acute pancreatitis as a rare adverse event following COVID-19 vector-based vaccination: A case report

Bayan Nurgaliyeva[1,2], Aizhan Moldakaryzova[3], Saken Khaidarov[3], Zhannat Aldasheva[4]

[1]Department of propaedeutic of internal diseases, Kazakh National Medical University named after S. Asfendyarov, Almaty, Kazakhstan; [2]KazMed Company LLP Outpatient Clinic, Almaty; [3]Department of Molecular Biology and Medical Genetics, Kazakh National Medical University named after S. Asfendyarov, Almaty, Kazakhstan; [4]Kazakhstan Medical University "Kazakhstan School of Public Health", Almaty, Kazakhstan

Abstract. *Background:* Acute pancreatitis (AP) has been reported rarely after vaccination against SARS-CoV-2. *Case:* We describe a 41-year-old vegetarian, non-smoking male who developed AP five days after the first dose of the adenoviral vector vaccine Gam-COVID-Vac (Sputnik V). On admission serum amylase was 3600 U/L and abdominal ultrasound demonstrated an enlarged, oedematous pancreas without gall-stones. The patient responded to conservative therapy and was discharged after seven days. *Conclusion:* Although causal inference cannot be drawn from a single observation, clinicians should remain aware of AP as a potential event after vector-based COVID-19 vaccination. (www.actabiomedica.it)

Key words: acute pancreatitis, COVID-19, vector vaccine, adverse event, case report

Introduction

Vaccination programmes against COVID-19 rely on several platforms, including viral vectors, inactivated virions and mRNA technologies. Kazakhstan's portfolio comprises the recombinant adenoviral vaccine Gam-COVID-Vac (Sputnik V), inactivated preparations (CoronaVac®, Sinopharm®, QazVac®) and the mRNA vaccine BNT162b2 (Pfizer-BioNTech) (1). Here we report a patient who fulfilled diagnostic criteria for AP five days after administration of Sputnik V. Sputnik V, officially registered as *Gam-COVID-Vac*, is a recombinant viral vector vaccine designed to protect against COVID-19 (2). The vaccine consists of two components:

- Component I: A recombinant adenoviral vector based on human adenovirus serotype 26 (rAd26) encoding the SARS-CoV-2 spike (S) protein
- Component II: A recombinant adenoviral vector based on human adenovirus serotype 5 (rAd5) encoding the same spike protein

The vaccine is administered intramuscularly in two doses, spaced three weeks apart (3). This heterologous prime-boost strategy—using two different adenovirus serotypes—is intended to enhance immunogenicity by avoiding neutralization due to pre-existing adenoviral immunity (4). Phase 1 and Phase 2 clinical trials published in *The Lancet* reported that no serious adverse events or fatalities were associated with the vaccine, supporting its initial safety profile (2).

Case presentation

A 41-year-old Russian male, born in 1980 in Almaty, Kazakhstan, received the first component of the Gam-COVID-Vac (Sputnik V) adenoviral vector vaccine on April 23, 2021. On the day of vaccination, he experienced a low-grade fever (37 °C) and mild epigastric discomfort, both of which resolved spontaneously without intervention. On the fifth day following vaccination, the patient developed acute girdling

epigastric pain accompanied by nausea and a single episode of syncope. He also experienced transient bradycardia, recorded at 42 bpm by his smartwatch (Apple Watch). Upon arrival of emergency medical services, his oxygen saturation was noted to be 63% and his pulse rate was 25 bpm. Oxygen supplementation and intravenous fluid resuscitation were promptly initiated, and he was transferred to the surgical department of a city clinical hospital in Almaty. The patient, a computer and network systems engineer (IT specialist), reported no prior history of chronic illness, hospitalizations, or surgeries. He adhered to a healthy lifestyle, including regular physical activity and abstinence from alcohol and tobacco. He had no history of tuberculosis, viral hepatitis, or sexually transmitted infections, and had never received blood products or transfusions. He denied any known drug allergies and reported no recent exposure to individuals with COVID-19 prior to vaccination.

Upon clinical examination, he appeared in moderate distress due to abdominal pain. Physical findings included tenderness in the epigastric region and left hypochondrium. Both Mayo-Robson and Cullen signs were positive. However, signs of peritoneal irritation were absent. Laboratory evaluation at the time of admission revealed markedly elevated serum amylase at 3600 U/L (reference range: 28–100 U/L), leukocytosis with a WBC count of 12.9×10^9/L, and neutrophilia with a left shift (neutrophils at 80%). Liver enzymes (ALT 11 U/L, AST 18 U/L), triglycerides (1.3 mmol/L), calcium (2.3 mmol/L), creatinine (78 μmol/L), urea (4.8 mmol/L), and total bilirubin (10.8 mmol/L) were all within normal limits. Coagulation studies showed a mildly elevated INR of 1.21 and a prothrombin index of 79%. Urinalysis revealed bilirubin at 9 μmol/L but was otherwise unremarkable. Esophagogastroduodenoscopy performed on April 30, 2021, showed findings consistent with chronic gastritis. Ultrasound examination of the hepatobiliary system and pancreas demonstrated features consistent with acute pancreatitis, including pancreatic enlargement, peripancreatic fluid accumulation, and dilation of the pancreatic duct, with no evidence of gallstones. Screening for infectious etiologies including HIV, hepatitis B and C, syphilis, and SARS-CoV-2 (via RT-PCR) was negative. An ECG was within normal limits. Based on clinical symptoms, laboratory findings, and ultrasound imaging, a diagnosis of acute pancreatitis was established. No common etiologies such as gallstones, alcohol use, hypertriglyceridemia, or viral hepatitis were identified. The patient received supportive treatment including bowel rest, intravenous isotonic crystalloids, analgesia with tramadol, octreotide, proton pump inhibitors, and prophylactic cefotaxime. By day five of hospitalization, serum amylase had decreased to 209 U/L and WBC count normalized to 7.7×10^9/L. The patient showed steady clinical improvement and was discharged without the need for ongoing medication.

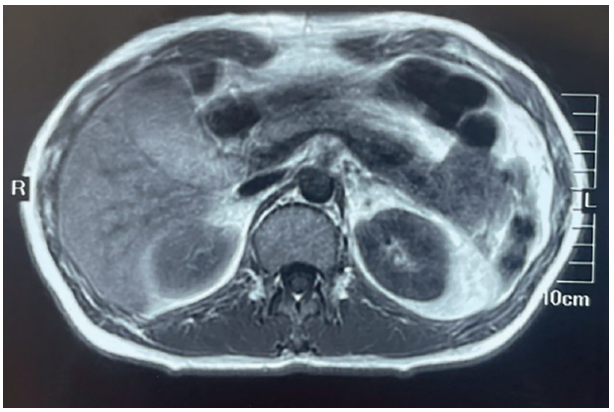

Figure 1. MRI signs of mild biliary stasis and early fibrotic changes.

One month after discharge, a follow-up MRI with MRCP was performed. It revealed a slightly enlarged liver with homogeneous parenchymal density and no intrahepatic bile duct dilation. The gallbladder had a thickened wall with perivesicular edema and stagnant bile. The pancreas showed a homogeneous structure with dimensions of 2.5 cm for the head, body, and tail. The spleen and kidneys were normal in size and structure. MRCP revealed no filling defects in the common bile duct, and the pancreatic duct measured approximately 3 mm in diameter. These findings were consistent with a recent episode of acute pancreatitis and showed signs of mild biliary stasis and early fibrotic changes, likely resulting from pancreatic necrosis that had occurred during the acute phase. A computed tomography (CT) scan of the abdominal cavity corroborated the presence of mild biliary stasis but showed no additional abnormalities (Figure 1).

According to national vaccination guidelines, completion of the two-dose schedule was required. After multidisciplinary consultation, and given the mild and self-limiting nature of the pancreatitis episode, the second dose of Gam-COVID-Vac was administered four weeks later. The patient tolerated the second dose without any adverse events.

Discussion

Acute pancreatitis is a potentially life-threatening inflammatory disorder of the pancreas with a broad spectrum of established etiologies. The most common causes include alcohol consumption, smoking, gallstones, hypertriglyceridemia, exposure to toxins, and the use of certain medications (5). In some cases, benign or malignant tumors causing obstruction of the pancreatic or biliary ducts may precipitate the condition (6). Pathophysiologically, acute pancreatitis is characterized by endothelial injury, increased vascular permeability, and fluid shifts, contributing to systemic hypoperfusion and potential multi-organ involvement (6). In the present case, no identifiable risk factors for acute pancreatitis were detected. The patient denied alcohol consumption and smoking and maintained a healthy, physically active lifestyle. Imaging excluded gallstones and biliary obstruction, while laboratory tests showed no evidence of hyperlipidemia or viral infection. The patient had not used any medications aside from the COVID-19 vaccination, and there was no history of autoimmune disease or gastrointestinal pathology. The temporal association between symptom onset and administration of the vector-based COVID-19 vaccine (Gam-COVID-Vac) raises the possibility of a vaccine-related adverse event. Although most reported cases of post-vaccination pancreatitis have been linked to the Pfizer-BioNTech (BNT162b2) mRNA vaccine (7,8,9), this case highlights the rare occurrence of acute pancreatitis following adenoviral vector-based vaccination. A proposed mechanism is molecular mimicry, in which vaccine-induced immune responses may cross-react with pancreatic antigens, particularly those in acinar cells (10). This immune activation, potentially enhanced by systemic inflammation and antibody production, could result in pancreatic injury in genetically or immunologically predisposed individuals. Importantly, both vector-based and mRNA vaccines lack live virus components and are not expected to exert direct cytopathic effects on pancreatic tissue. Therefore, the clinical presentation supports an immune-mediated etiology rather than a viral or toxic mechanism. This is consistent with other rare vaccine-associated inflammatory events, such as myocarditis and immune thrombocytopenia reported after COVID-19 vaccination.

Although causality cannot be established based on a single case, this report contributes to the emerging literature suggesting a potential link between COVID-19 vaccination and acute pancreatitis. Clinicians should be aware of this rare complication and consider pancreatic evaluation in patients presenting with unexplained abdominal pain following recent COVID-19 vaccination.

Conclusion

AP after Gam-COVID-Vac appears rare. Clinicians should include pancreatitis in the differential diagnosis of acute abdominal pain soon after COVID-19 vaccination and pursue standard work-up to exclude common causes.

Ethic Approval: Study approved by the Ethics Committee of LLP KazMed Company (Protocol № 1, 18 June 2025).

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

Authors Contribution: BN., AM., SK. and ZA. all participated in study design, data analysis, manuscript drafting and approved the final version.

Declaration on the Use of AI: No AI tool was used for data analysis, interpretation, or content generation.

Consent for Publication: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

References

1. COVID-19 vaccination in Kazakhstan [Internet]. Wikipedia, The Free Encyclopedia; [cited 2025 Jul 1]. Available from: https://ru.wikipedia.org/wiki/Вакцинация_против_COVID-19_в_Казахстане
2. Logunov DY, Dolzhikova IV, Zubkova OV, et al. Safety and immunogenicity of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine in two formulations: two open, non-randomised phase 1/2 studies from Russia. Lancet. 2020;396(10255):887–97. doi:10.1016/S0140-6736(20)31866-3
3. Sputnik V COVID-19 vaccine [Internet]. Wikipedia, The Free Encyclopedia; [cited 2025 Jul 1]. Available from: https://en.wikipedia.org/wiki/Sputnik_V_COVID-19_vaccine
4. Jones I, Roy P. Sputnik V COVID-19 vaccine candidate appears safe and effective. Lancet. 2021;397(10275):642–3. doi:10.1016/S0140-6736(21)00191-4
5. Yadav D, Lowenfels AB. The epidemiology of pancreatitis and pancreatic cancer. Gastroenterology. 2013;144(6):1252–61.
6. Tenner S, Vege SS, Sheth SG, et al. American College of Gastroenterology guidelines: management of acute pancreatitis. Am J Gastroenterol. 2024;119(3):419–37. doi:10.14309/ajg.0000000000002645
7. Parkash O, Sharko A, Farooqi A, Ying GW, Sura P. Acute pancreatitis: a possible side effect of COVID-19 vaccine. Cureus. 2021;13(4):e14741. doi:10.7759/cureus.14741
8. Cieslewicz A, Dudek M, Krela-Kazmierczak I, Jablecka A, Lesiak M, Korzeniowska K. Pancreatic injury after COVID-19 vaccine: a case report. Vaccines (Basel). 2021;9(6):576. doi:10.3390/vaccines9060576
9. Shlomovitz E, Davies W, Cairns E, Brintnell WC, Goldszmidt M, Dresser GK. Severe necrotizing pancreatitis following combined hepatitis A and B vaccination. CMAJ. 2007;176(3):339–42. doi:10.1503/cmaj.060360
10. Hussain A, Augustine SW, Pyakurel S, et al. Acute pancreatitis induced by COVID-19 vaccine: a systematic review. Cureus. 2024;16(3):e55426. doi:10.7759/cureus.55426

Correspondence:
Received: 16 June 2025
Accepted: 16 July 2025
Bayan Nurgaliyeva, MD
Kazakh National Medical University, Tole Bi St 88, Almaty 050000, Kazakhstan
E-mail: nurgalieva.b@kaznmu.kz,
ORCID: 0000-0003-2555-8644