

Letters

HAART, THE HEART AND THE POTENTIAL FOR INTERACTION

Editor,

Approximately 103,800 people in the UK are living with human immunodeficiency virus (HIV) as a chronic disease, reflecting the major impact of highly active antiretroviral therapy (HAART). Physicians will be familiar with links between HIV and acute coronary events^{1, 2} but may be less familiar with potential interactions between HAART and cardiovascular medication. We describe a patient living with HIV who underwent primary percutaneous coronary intervention (PPCI) with stent implantation for acute myocardial infarction, along with some important therapeutic considerations that were required to optimise his cardiovascular prognosis.

A 47-year old man presented with acute chest pain for 4 hours and was diagnosed with ST-elevation myocardial infarction. He underwent PPCI with stenting of an acutely occluded proximal left anterior descending coronary artery. An echocardiogram showed impaired left ventricular systolic function with an ejection fraction of 30%. Standard therapy with aspirin and ticagrelor were commenced along with eplerenone, atorvastatin, ramipril and bisoprolol.

The patient was HIV-positive, well controlled on HAART comprising a combination of emtricitabine/tenofovir and efavirenz. Since 1999 the University of Liverpool has maintained a free HIV drug interaction resource which enables healthcare professionals to check HAART against any new medication being initiated. It provides a traffic light system demonstrating the strength of any potential interaction, a summary of the evidence and the specific effect expected. The Table summarises its comments relating to interactions with antiplatelet therapy.

	Clopidogrel	Ticagrelor	Prasugrel
Emtricitabine	Unlikely to affect	Unlikely to affect	Unlikely to affect
Tenofovir	Unlikely to affect	Unlikely to affect	Unlikely to affect
Efavirenz	May diminish efficacy	May diminish efficacy	Unlikely to affect
Etravirine	May diminish efficacy	May diminish efficacy	
Abacavir	May diminish efficacy	Unlikely to affect	Unlikely to affect
Nevirapine	May enhance efficacy	May diminish efficacy	
Darunavir/Ritonavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Darunavir/Cobicistat	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Atazanavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Fosamprenavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Indinavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Lopinavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Saquinavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Tipranavir	Likely to diminish efficacy	Likely to enhance efficacy	Unlikely to affect
Dolutegravir	Unlikely to affect	Unlikely to affect	Unlikely to affect

Table. Potentially important effects of antiretroviral drugs on the efficacy of antiplatelet agents³. Those relevant to this patient are highlighted in bold

Because efavirenz could potentially decrease ticagrelor efficacy due to induction of cytochrome P450 3A4, we switched from ticagrelor to prasugrel. Additionally, because of potential interactions between efavirenz, atorvastatin and eplerenone, we switched the latter two to rosuvastatin and spironolactone.

HAART has been a key development in modern medicine, achieving a life expectancy for people living with HIV close to that of the HIV-negative population⁴. Primary PCI is another major advance, but relies on effective dual antiplatelet therapy to prevent stent thrombosis, a highly-lethal early complication⁵.

Clinical teams should be aware of potential overlaps between HAART and cardiovascular medicines, as well as a valuable resource that guides the selection of agents least likely to be compromised by co-prescription with HAART.

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REFERENCES

- Freiberg MS, Chang C-CH, Kuller LH, Skanderson M, Lowy E, Kraemer KL et al. HIV infection and the risk of acute myocardial infarction. *JAMA Intern Med.* 2013; **173**(8): 614 – 622.
- Friis-Møller N, Reiss P, Sabin CA, Weber R, Monforte A, El-Sadr W et al. Class of antiretroviral drugs and the risk of myocardial infarction. *N Engl J Medicine.* 2007; **356**(17): 1723-35
- <https://www.hiv-druginteractions.org/checker>
- Marcus JL, Leyden WA, Alexeeff SE, Anderson AN, Hechter RC, Hai-Hong H et al. Comparison of Overall and Comorbidity-Free Life Expectancy Between Insured Adults With and Without HIV Infection, 2000-2016. *JAMA Network Open.* 2020; **3**(6): e207954
- Heestermans AACM, Van Werkum JW, Zwart B., Van Der Heyden JA, Kelder JC, Breet NJ et al. Acute and subacute stent thrombosis after primary percutaneous coronary intervention for ST-segment elevation myocardial infarction: incidence, predictors and clinical outcome. *J ThrombHaemost* 2010;**8**: 2385-2393.

REACTIVE NON-REGIONAL LYMPHADENOPATHY FROM THE COVID-19 mRNA VACCINE: A NOVEL SIDE-EFFECT

Editor,

A 42-year-old South-Asian male presented with multiple new painful lumps in his right groin, 1 week after receiving his 2nd dose of the Pfizer vaccine in the left arm. Systematic questioning did not reveal any history of temperatures, night sweats, or weight loss. There was no history of injury to the right leg or any signs of local infection. There also was no history of genital discharge or ulceration. No past medical history of tuberculosis or family history of cancer was noted. Recent travel history was unremarkable.

On examination two lumps were palpable in the distribution of the vertical chain of inguinal lymph nodes.



These were tender, firm in consistency and had a smooth surface. Systemic examination revealed no significant lymphadenopathy in the other regions. Abdominal and urogenital examination was also unremarkable.

Biochemical investigations revealed normal inflammatory markers including white cell count of $5.49 \times 10^9/L$, C-Reactive protein 0.7 mg/L and ESR 2 mm/hour on 2 consecutive samples thereby making the suspicion of an infectious aetiology like tuberculosis less likely. Lactate dehydrogenase was 180 U/L and full blood count was normal (Haemoglobin 150 g/L, Platelet count $265 \times 10^9/L$) ruling out the possibility of haematological malignancy. Other biochemical tests including urea and electrolytes, liver enzymes, ferritin, vitamin B12 and folate levels, corrected calcium, and alkaline phosphatase levels were all found to be within normal range. An ultrasound scan (USS) confirmed two inguinal lymph nodes (Figure 1 images a, b) with the largest lymph node measuring 3cm in diameter and described as homogenous with preserved hila in keeping with reactive lymphadenopathy. A follow up USS in 4 weeks revealed a significant reduction in size (6mm) (Figure 1 images c, d) and their appearance was also reported to be normal. Further clinical follow-up in 3 months revealed absence of any ongoing or new symptoms and complete resolution of inguinal lymphadenopathy.

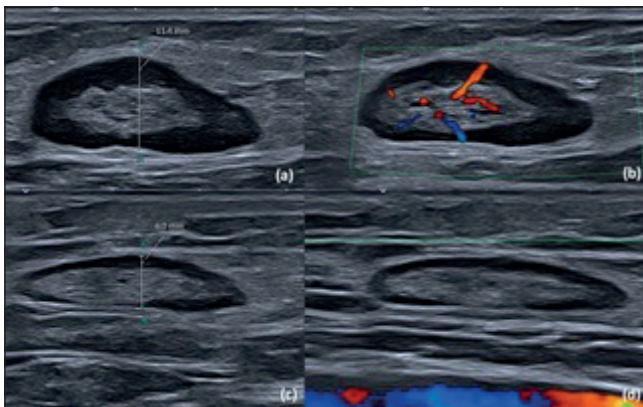


Fig. 1: Grey scale (a) and Colour Doppler (b) ultrasound images of the right groin 10 days after the COVID vaccine demonstrated a mildly enlarged superficial femoral lymph node (vertical group) measuring 11.4 mm in short axis diameter with preserved fatty hilum and minimally increased hilar vascularity, in keeping with a reactive lymphadenitis, corresponding to clinically palpable mildly tender lump.

Follow up grey scale (c) and Colour Doppler (d) ultrasound images of the right groin showed complete regression of the reactive lymphadenitis to normal, appearing right superficial femoral lymph node measuring 6 mm in short axis diameter with negligible vascularity on colour Doppler correlation.

At the time of writing this report non-regional reactive lymphadenopathy had not been reported as a possible transient side-effect to any vaccine^{1, 2, 3}. This is hence the first reported case in literature highlighting this novel side-

effect. The authors acknowledge the absence of a definitive investigation that could confirm direct causation between the vaccine and our case's presentation. However, the absence of any other plausible explanation, the timing of development of the symptoms after the vaccine administration, and complete clinical and radiological resolution of inguinal lymphadenopathy with conservative management supports the hypothesis that this was an adverse reaction to the novel vaccine. Furthermore, the initial radiological appearance of a reactive lymphadenopathy also reinforces our suspicion.

This case emphasizes the importance of obtaining recent immunization history in people presenting with unexplained lymphadenopathy, thereby possibly avoiding the need for further CT imaging and invasive lymph node biopsy tests. There has also been a lot of interest in investigating the migratory function of dendritic immune cells as a cause of local lymphadenopathy following inflammation^{4, 5}. This case also highlights the need for further research to fully understand the pathophysiology of distant site lymph node activation following vaccine administration.

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REFERENCES

- Hiller N, Goldberg SN, Cohen-Cymerberknoh M, Vainstein V, Simanovsky N, *et al*. Lymphadenopathy associated with the COVID-19 vaccine. *Cureus*. 2021; 13(2): e13524. doi: 10.7759/cureus.13524.
- Polack FP, Thomas SJ, Kitchin N, Absalon J, Gurtman A, Lockhart S, *et al*. Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. *N. Engl. J. Med.* 2020;383(27): 2603–15.
- Mehta N, Sales RM, Babagbemi K, Levy AD, McGrath AL, Drotman M, *et al*. Unilateral axillary Adenopathy in the setting of COVID-19 vaccine. *Clin Imaging*. 2021; 75: 12-5.
- Steinman RM. Dendritic cells and vaccines. *Proc (Bayl Univ Med Cent)*. 2008; 21(1): 3-8.
- Martín-Fonchechaet A, Lanzavecchia A, Sallustion F. Dendritic cell migration to peripheral lymph nodes. *Handb Exp Pharmacol*. 2009;(188):31-49. doi: 10.1007/978-3-540-71029-5_2.

ALLERGIC CONTACT DERMATITIS TO A COMMON TOPICAL ACNE TREATMENT – AN UNFAMILIAR MIMIC OF ANGIOEDEMA.

Editor,

A previously healthy, non-atopic 12-year-old girl presented to the Emergency Department with a pruritic, facial skin eruption. Examination revealed localised facial swelling, tenderness and erythema limited to periorbital, malar, and nasal areas (Figure 1). The patient was commenced on intravenous antibiotics and admitted for inpatient observation.

Concern was heightened six hours later, with urgent review demonstrating rapid progression in symptom severity.



Figure 1. Photograph upon initial presentation of mild/moderate facial erythema, crusting and swelling.

Examination revealed marked periorbital oedema resulting in almost complete palpebral fissure closure, with skin thickening, coalescing papules and honey-coloured crusts (Figure 2). Reassuringly, there were no signs of airway, respiratory, cardiovascular, or gastrointestinal compromise, and normal vital signs made anaphylaxis unlikely. Likewise, without visual disturbance or restriction in eye movement, concerns of periorbital cellulitis were lowered.

Upon revisiting the history, the exacerbation coincided with the continued use of topical Benzoyl Peroxide (BPO)



Figure 2. Photograph six hours later of florid/marked facial swelling, erythema and coalescing papules with honey-coloured crusts associated with allergic contact dermatitis.

gel which had been prescribed by her general practitioner two weeks earlier as a common first line agent used in mild papulopustular acne.

Treatment with oral corticosteroids and topical corticosteroid/antibiotic therapy was commenced. Marked improvement was seen within twenty-four hours of treatment with complete resolution achieved at two weeks. While a patch test was not performed to confirm sensitization, the clinical presentation and timing of symptoms were deemed pathognomonic for Allergic Contact Dermatitis (ACD), as recognised instantaneously upon consultation by dermatology colleagues. While practice has moved away from patch testing in paediatric populations, avoidance measures were successfully undertaken for products containing topical BPO and alternative topical acne treatments commenced without symptom recurrence.

ACD is an inflammatory skin response induced by contact with an allergen, causing a type four hypersensitivity reaction. When it manifests on the face, it is often misdiagnosed as angioedema due to the marked periorbital swelling¹. It can be differentiated from angioedema by demonstration of associated superficial erythema, dermatitis, pruritus, tenderness and, most importantly, a history of allergen contact. Later, as the swelling resolves, desquamation is a distinguishing feature of ACD, in contrast to patients with angioedema.

BPO is a common first line topical treatment for acne vulgaris in children and young people². While common side effects of skin irritation are recognised and reflect BPO's irritant properties, little is known of its allergenicity³. ACD to BPO as described, is felt to be underreported due to its similarity in clinical presentation to irritant contact dermatitis⁴. Symptom onset and exposure history can be helpful in establishing the diagnosis which is ultimately verified upon patch testing⁵.

While there are few reported cases of contact sensitisation to BPO, risk factors for ACD have been identified. These include a compromised epidermal barrier, allergen contact at multiple sites and prolonged, frequent exposure. Multiple risk factors result in a more severe reaction, as in our case.

This case highlights ACD as a cause of pseudoangioedema - knowledge of which will help paediatricians and General Practitioners target the correct underlying pathophysiology when assessing children and adolescents using this agent for treatment of acne vulgaris. With improved awareness of its allergenicity, adolescents can be safely counselled regarding its application and side effect profile.

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REFERENCES

1. Andersen MF, Longhurst HJ, Rasmussen ER, Bygum A. How not to be misled by disorders mimicking angioedema: A review of pseudoangioedema. *Int Arch Allergy Immunol.* 2016;**169**(3):163–70. Available from: <http://dx.doi.org/10.1159/000445835>
2. Overview | Acne vulgaris: management | Guidance | NICE. [cited 2022 Feb 3]; Available from: <https://www.nice.org.uk/guidance/ng198>
3. Yang Z, Zhang Y, Lazic Mosler E, Hu J, Li H, Zhang Y, et al. Topical benzoyl peroxide for acne. *Cochrane Libr.* 2020; Available from: <http://dx.doi.org/10.1002/14651858.cd011154.pub2>
4. Felton SJ, Orton D, Williams JDL. Benzoyl peroxide in topical acne preparations: an underreported contact allergen? *Dermatitis.* 2013;**24**(3):146–7. Available from: <http://dx.doi.org/10.1097/DER.0b013e31828d02e2>
5. Smith HR, Basketter DA, McFadden JP. Irritant dermatitis, irritancy and its role in allergic contact dermatitis. *Clin Exp Dermatol.* 2002;**27**(2):138–46. Available from: <http://dx.doi.org/10.1046/j.1365-2230.2002.00997.x>

RESPONSE TIMES FOR ACUTE NON-INVASIVE VENTILATION SET-UPS

Dear Editor,

NIV is a lifesaving treatment in chronic obstructive pulmonary disease (COPD). Prompt NIV treatment in hypercapnic COPD exacerbations allows for improved physiological outcomes, reduced intubation rates and shortened hospital stay in (1, 2). Therefore, consensus expert opinion is that prompt application of acute NIV substantially reduces the risk of death and should be started without delay in appropriately selected patients with acute hypercapnic respiratory failure (AHRF). The ‘door-to-mask’ time (hospital arrival to NIV commencement: target ≤ 120 minutes) has been widely used to measure the quality of acute NIV services as per the 2018

reported a median ‘door-to-mask’ time at the emergency department at Heartlands Hospital in 2014 of 115 min, meeting the 2018 BTS quality standard of ≤ 120 minutes(5). As part of an important quality improvement initiative, we have subsequently developed internal guidelines and monthly NIV training sessions to try to improve acute NIV service quality. We aimed to look at response times within the door-to-mask time using standards derived from the British Thoracic Society/Intensive Care Society Guideline for the ventilatory management of acute hypercapnic respiratory failure and 2019 BTS NIV Audit Report to generate insights for future quality improvement (6) (Figure 1).

Data on metrics were recorded for all acute NIV recipients in the Emergency Department (ED) at Heart of England Foundation NHS Trust and stored in our acute NIV quality database for subsequent extraction and calculation of median (interquartile ranges (IQR)). Between 27/03/19 and 26/09/19, 89 patients received NIV with 46 starting on acute NIV in ED, 38 developed acidosis later and 5 had incomplete data(7). The total door to mask time in ED was 163 (197) mins. Within this, the door-to-first-ABG time was 29 (55) minutes, the first-ABG-to-Decision making/call time was 72 (77)minutes and decision making-to-mask time was 40 (20) minutes. We saw an increase in door-to-mask time from 2014 to 2019, likely reflecting the national increase in ED wait times. However, the decision-making to mask time was 40 min which has decreased from 55 since 2014, reflecting the improved response times of physiotherapists potentially due to feedback on performance and monthly NIV training sessions for allied health professionals, as well as internal guideline development (8). This audit is part of a continual quality improvement project and will serve as a foundation to monitor specific response times and quality with iterative interventions. With the ongoing COVID-19 pandemic and stringent infection control measures around aerosol generating procedures, it is now essential to determine the impact this has had on NIV service quality and excess deaths with a view for continual quality improvement.

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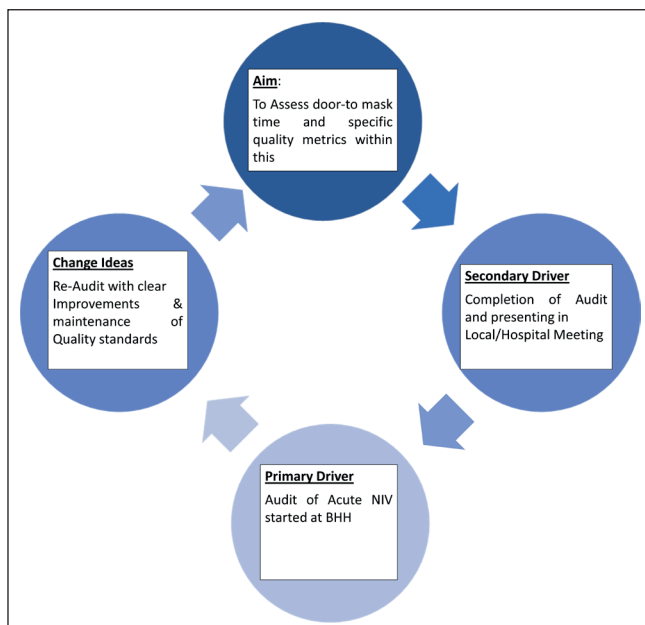
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BTS Quality Standards (3, 4). In setting a 120 min target from arrival to mask application, this statement intends to establish that recognition and treatment of AHRF are time-critical events for patients admitted acutely. We previously

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REFERENCES

1. Plant P, Owen J, Elliott M. Early use of non-invasive ventilation for acute exacerbations of chronic obstructive pulmonary disease on general respiratory wards: a multicentre randomised controlled trial. *The Lancet*. 2000;355(9219):1931-5.
2. Roberts CM, Stone RA, Buckingham RJ, Pursey NA, Lowe D. Acidosis, non-invasive ventilation and mortality in hospitalised COPD exacerbations. *Thorax*. 2011;66(1):43-8.
3. Davies M, Allen M, Bentley A, Bourke SC, Creagh-Brown B, D'Oliveiro R, et al. British Thoracic Society Quality Standards for acute non-invasive ventilation in adults. *BMJ open respiratory research*. 2018;5(1).
4. The British Thoracic Society. 2018. BTS Quality Standards for acute NIV in adults. <https://www.brit-thoracic.org.uk/document-library/quality-standards/niv/bts-quality-standards-for-acute-niv-in-adults/>. [Accessed November 11 2020].
5. Boryslawskij H, Rauf F, Beauchamp B, Oakes A, Santana-Vaz N, Chakraborty B, et al. P297 Effect Of Bts-recommended Medical Leadership On The "door-to-mask" Time Of Acute Non-invasive Ventilation (niv) Set Ups. *Thorax*. 2014;69(Suppl 2):A204-A5.
6. British Thoracic Society. 2019. BTS National Audit Report: Adult NIV Audit 2019: 1 February – 31 March 2019. <https://www.brit-thoracic.org.uk/document-library/quality-improvement/audit-reports/adult-niv-audit-report-2019/> [Accessed November 8 2020].
7. Antoine-Pitterson P, Robinson A, Jones B, Shanmugarajah A, Thomas M, Al Helou A, et al. Improving response times for acute non-invasive ventilation (NIV) set-ups. *European Respiratory Journal*. 2020;56(suppl 64):3429.
8. NICE. 2018. Nice guideline: Internal guideline development and monthly NIV training sessions improve acute NIV service quality.

UNUSUAL CASES OF ACUTE PANCREATITIS IN PATIENTS WITH COVID-19

Editor,

COVID-19 commonly presents as cough, shortness of breath, and fever, but extrapulmonary manifestations are being reported in recent times¹. This is consistent with the fact that the ACE2 receptors through which the coronavirus SARS-CoV-2 enters cells are present in many organs beside the lung². Gastrointestinal involvement in COVID-19 has become more common with many patients presenting with pain abdomen, diarrhoea, nausea and vomiting³. Here we

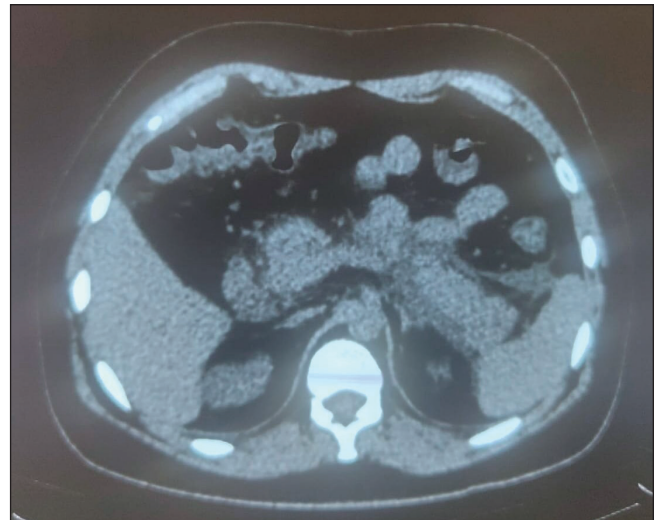


Figure 1: Axial plain CT images showing enlarged pancreas with peripancreatic fat stranding

outline 2 cases of COVID-19 associated acute pancreatitis.

A 33 year-old male diagnosed with COVID-19 presented with loose non foul-smelling and non blood-tinged stools, vomiting and pain abdomen. The patient had stable vitals and denied consumption of alcohol over the last 4 months. The epigastric and left hypochondriac region were tender on palpation. Lab investigations revealed grossly elevated serum lipase (5257 IU/L) and amylase (3269 IU/L). CT scan of the abdomen and pelvis revealed perinephric fat stranding in the head, body and part of the tail of the pancreas- suggestive of acute oedematous pancreatitis. Minimal peripancreatic fluid was also seen extending to the anterior perinephric fascia (Figure 1). A diagnosis of acute pancreatitis secondary to COVID-19 infection was made. The patient was given IV fluids, broad spectrum IV antibiotics, analgesics and other supportive treatment. A CT guided fluid aspiration was done for the peripancreatic fluid which was sterile. Patient recovered completely following treatment and was discharged.

In another instance, 76-year-old woman tested positive for COVID-19 after developing low grade intermittent fever over 10 days. Over the course of her home isolation, she developed generalised weakness and myalgia, productive cough MMRC grade 3 breathlessness. She did not consume alcohol.

Respiratory rate was 32 cpm and on auscultation bilateral crepitations were heard in the infrascapular areas. A high resolution CT scan of the chest showed features suggestive of COVID-19 pneumonia with a CT score of 17 out of 25.

Two days after admission, she started developing pain in the epigastric and left hypochondriac area which was tender on palpation and was associated with nausea and vomiting. Repeat investigations revealed grossly elevated amylase (1955 IU/L) and lipase (4895 IU/L). Abdominal ultrasound detected the presence of minimal ascites, prominent pancreatic duct and fluid collection near the tail of the



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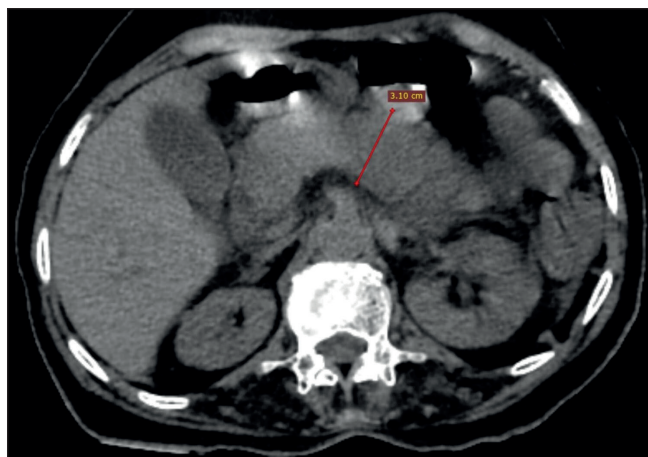


Figure 2: Plain CT axial view showing enlarged pancreas with fluid in the tail region with peripancreatic fat stranding.

pancreas. NECT of abdomen revealed a bulky pancreas, with inflammatory fat stranding present at the tail end of the pancreas and some enlarged peripancreatic lymph nodes present near the pancreatic tail (Figure 2). The patient was given IV fluids, broad spectrum IV antibiotics, analgesics and other supportive treatment. Despite resolution of the pancreatitis with treatment, the patient developed worsening lung complications and succumbed to the disease.

COVID-19 infection has been linked to pancreatitis in the absence of traditional risk factors like alcohol consumption or gallstones⁴, as in the case of our patients, both of whom had neither a significant history of alcohol consumption or any evidence of gallstones on imaging. Other causes of pancreatitis include trauma and steroid use, and a history of neither was present in our patients. Both patients had no history of pain or swelling in the parotid region- which would rule out mumps as a potential cause of pancreatitis. Furthermore, neither patient had a history of scorpion stings, which is a rare cause of cause pancreatitis. In both patients serum calcium and triglycerides were within normal limits. Considering all the above, a diagnosis of COVID-19 related pancreatitis was made. As more cases of acute pancreatitis in patients with COVID-19 are being reported, it becomes pertinent to screen patients with COVID-19 presenting with gastrointestinal complaints for pancreatitis with serum amylase, lipase and abdominal CT scan.

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REFERENCES:

1. Gupta A, Madhavan MV, Sehgal K, Nair N, Mahajan S, Sehrawat TS, *et al.* Extrapulmonary manifestations of COVID 19. *Nat Med.* 2020;26(7):1017-32.
2. de-Madaria E, Capurso G. COVID-19 and acute pancreatitis: examining the causality. *Nat Rev Gastroenterol Hepatol.* 2021;18(1):3-4.
3. Song Y, Liu P, Shi XL, Chu YL, Zhang J, Xia J, *et al.* SARS-CoV-2 induced diarrhoea as onset symptom of patient with COVID-19. *Gut.* 2020;69(6):1143-4.
4. Lakshmanan S, Malik A. Acute pancreatitis in Mild COVID-19 infection. *Case Reports. Cereus.* 2020;12(8): e9886. doi: 10.7759/cureus.9886