CIRUGÍA ESPAÑOLA

www.elsevier.es/cirugia

Letters to the Editor

Pathogenesis of pneumoperitoneum in a COVID-19 patients☆

Etiopatogenia de neumoperitoneo en pacientes COVID-19

To the Editor:

Gemio del Rey et al.[1] describe a case of spontaneous pneumoperitoneum in a patient with bilateral SARS-CoV-2 pneumonia, with no signs of a systemic inflammatory response and having ruled out an intra-abdominal cause. The authors wisely associated pneumoperitoneum with mechanical ventilation.

In patients with coronavirus 2019 (COVID-19), intestinal pneumatosis and pneumoperitoneum have occasionally been described without observed intestinal perforation.[2–4] In these case, the etiopathogenic cause has been related with direct damage to the intestinal mucosa by SARS-CoV-2—the intestinal epithelium has abundant receptors for angiotensin converting enzyme-2 (ACE-2)—and to ischemic mechanisms secondary to arterial and venous splanchnic thrombosis.[5,6]

One of the most striking phenomena in COVID-19 patients are thromboembolic complications at multiple levels, secondary to the severe systemic inflammatory response induced by SARS-CoV-2.[7,8] Therefore, antithrombotic prophylaxis is recommended in most patients with moderate or severe COVID-19.[9,10]

Although the case described by Gemio del Rey et al.[1] does not report the progression of fibrinogen or D-dimer levels, we feel that this etiopathogenic possibility should be considered in COVID-19 patients.

REFERENCES

1. Gemio del Rey IA, de la Plaza Llamas R, Ramia JM, Medina Velasco AA, Díaz Candelas DA. Non-surgical spontaneous pneumoperitoneum in a COVID-19 positive patient with severe bilateral pneumonia. Cir Esp. 2020. http://dx.doi.org/10.1016/j.ciresp.2020.05.030.
2. Kielty J, Duggan WP, O'Dwyer M. Extensive pneumatosis intestinalis and portal venous gas mimicking mesenteric ischaemia in a patient with SARS-CoV-2. Ann R Coll Surg Engl. 2020;102:E145–7. http://dx.doi.org/10.1308/rcsann.2020.0145.
3. Láinez Ramos-Bossini AJ, Pérez García M del C, Pérez Rosillo MÁ, Gálvez López R. Spontaneous pneumoperitoneum and pneumatosis intestinalis as sole manifestations of a COVID-19 infection. An extremely rare complication. Rev Esp Enferm Dig. 2020;113. http://dx.doi.org/10.17235/reed.2020.7601/2020.
4. Lui K, Wilson MP, Low G. Abdominal imaging findings in patients with SARS-CoV-2 infection: a scoping review. Abdom Radiol. 2020;1–7. http://dx.doi.org/10.1007/s00261-020-02739-5.
5. Mönkemüller K, Fry LC, Rickes S. COVID-19, coronavirus, SARS-CoV-2 and the small bowel. Rev Esp Enferm Dig. 2020;112:383–8. http://dx.doi.org/10.17235/reed.2020.7137/2020.
6. Xiao F, Tang M, Zheng X, Liu Y, Li X, Shan H. Evidence for gastrointestinal infection of SARS-CoV-2. Gastroenterology. 2020;158:1831.e3.
7. Fajgenbaum DC, June CH. Cytokine storm. N Engl J Med. 2020;383:2255–73. http://dx.doi.org/10.1056/NEJMra2026131.
8. Nicolai L, Leunig A, Brambs S, Kaiser R, Weinberger T, Weigand M, et al. Immunothrombotic dysregulation in COVID-19 pneumonia is associated with respiratory failure and coagulopathy. Circulation. 2020;142:1176–89. http://dx.doi.org/10.1161/CIRCULATIONAHA.120.048488.
9. Berlin DA, Gulick RM, Martinez FJ. Severe Covid-19. N Engl J Med. 2020. http://dx.doi.org/10.1056/nejmcp2009575.
10. Bikdeli B, Madhavan MV, Jimenez D, Chuich T, Dreyfus I, Driggin E, et al. COVID-19 and thrombotic or thromboembolic disease: implications for prevention, antithrombotic therapy, and follow-up. J Am Coll Cardiol. 2020. http://dx.doi.org/10.1016/j.jacc.2020.04.031.

☆ Please cite this article as: Cienfuegos JA, Almeida A, Aliseda D, Rotellar F. Etiopatogenia de neumoperitoneo en pacientes COVID-19. Cir Esp. 2021;99:476–477.

Javier A. Cienfuegos[a,b,c], Ana Almeida[a,*], Daniel Aliseda[a], Fernando Rotellar[a]

[a]*Departamento de Cirugía General y Digestiva, Clínica Universidad de Navarra, Pamplona, Navarra, Spain*
[b]*Instituto de Investigación Sanitaria de Navarra (IdisNA), Pamplona, Navarra, Spain*
[c]*CIBER Fisiopatología de la Obesidad y Nutrición (CIBERobn), Instituto de Salud Carlos III, Pamplona, Navarra, Spain*

**Corresponding author.*

E-mail address: aavargas@unav.es (A. Almeida).

2173-5077/

Reply to the Letter to the Editor "Pathogenesis of pneumoperitoneum in COVID-19 patients"☆

Réplica a la Carta al Director «Etiopatogenia de neumoperitoneo en pacientes COVID-19»

To the Editor,

As stated by Cienfuegos et al.,[1] the incidence of non-surgical spontaneous pneumoperitoneum in positive COVID-19 patients is becoming more frequent as the incidence of infection grows exponentially,[2,3] in addition to other types of gastrointestinal manifestations. Inflammatory bowel processes are being described related with direct damage to the mucosa mediated by receptors as well as ischemic processes secondary to splanchnic thrombosis.[4,5]

In our patient,[6] the evolution of fibrinogen ranged from 370 mg/dL upon admission to the ICU and 180 mg/dL upon discharge. As for D-dimer levels, these peaked at 35.05 mg/L and had dropped to 2.83 mg/L at discharge.

Based on these parameters, we cannot categorically rule out that spontaneous pneumoperitoneum was caused by direct damage to the mucosa or by intestinal ischemia secondary to splanchnic thrombosis, especially due to the limited number of cases published to date. Even so, this seems unlikely, since the CT scan in our case did not show intestinal pneumatosis, and tomography is a very sensitive test.

In the original publication by Cienfuegos et al.,[2] it is striking that the patient initiated enteral nutrition (EN) on day 2 of the ICU stay. On day 8, with no signs of ischemia, such as elevated lactic acid, the patient had diarrhea, abdominal distension, foul-smelling discharge from the nasogastric (NG) tube, and a CT scan detected intestinal pneumatosis (IP). This required the cessation of enteral nutrition, after which the symptoms were resolved. Several cases of IP associated with EN[7,8] have been published in the literature, with complete resolution of symptoms after its withdrawal, so the direct association with COVID-19 infection is not guaranteed in this case.

The same occurred in the second published case report.[3] The finding of spontaneous pneumoperitoneum occurred in the context of a positive COVID-19 patient with no associated respiratory symptoms. It cannot be ruled out that the pneumoperitoneum and intestinal pneumatosis were due to viral infection, but it would be interesting for the authors of the article to rule out other common causes of spontaneous pneumoperitoneum, such as cystic intestinal pneumatosis.[9–11] In fact, the authors of the article acknowledge that more case series are required to support this statement.

Thus, it is clear that COVID-19 infection involves intestinal manifestations,[12] which requires further study in large series. Even so, we must bear in mind that many of these manifestations may be due to prevalent diseases and not related to the viral infection. In short: not everything that happens in COVID-19–positive patients is due to the infection itself.

REFERENCES

1. Cienfuegos JA, Almeida A, Aliseda D, Rotellar F. Etiopatogenia de neumoperitoneo en pacientes COVID-19. Cir Esp. 2020. http://dx.doi.org/10.1016/j.ciresp.2021.01.012 [Epub ahead of print].
2. Kielty J, Duggan WP, O'Dwyer M. Extensive pneumatosis intestinalis and portal venous gas mimicking mesenteric ischaemia in a patient with SARS-CoV-2. Ann R Coll Surg Engl. 2020;102:E145–7. http://dx.doi.org/10.1308/rcsann.2020.0145.
3. Láinez Ramos-Bossini AJ, Pérez García M del C, Pérez Rosillo MÁ, Gálvez López R. Spontaneous pneumoperitoneum and pneumatosis intestinalis as sole manifestations of a COVID-19 infection. An extremely rare complication. Rev Esp

DOI of original article: http://dx.doi.org/10.1016/j.cireng.2021.03.012
☆ Please cite this article as: Gemio del Rey IA, de la Plaza Llamas R, Ramia JM, Medina Velasco AA. Réplica a la Carta al Director «Etiopatogenia de neumoperitoneo en pacientes COVID-19». Cir Esp. 2021;99:477–478.