Pneumoretroperitoneum secondary to pneumomediastinum in a child with coronavirus disease-2019

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September 25, 2021

Abstract

Pneumomediastinum is a known complication of mechanical ventilation. Infrequently, it secondarily arises from pneumoperitoneum or pneumoretroperitoneum, when air travels along the fascial planes to enter the mediastinum. Conversely, pneumoretroperitoneum secondary to pneumomediastinum is even rare but could occur in mechanically ventilated patients.

Category of the manuscript: Clinical Images

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Funding: None of the authors received an honorarium, grant, or other forms of payment to produce this manuscript.

Conflicts of Interest: The authors declare no conflicts of interest.

Key Clinical Message

Pneumomediastinum is a known complication of mechanical ventilation. Pneumoretroperitoneum secondary to pneumomediastinum is rare but could occur in mechanically ventilated patients.

Abstract

Pneumomediastinum is a known complication of mechanical ventilation. Infrequently, it secondarily arises from pneumoperitoneum or pneumoretroperitoneum, when air travels along the fascial planes to enter the mediastinum. Conversely, pneumoretroperitoneum secondary to pneumomediastinum is even rare but could occur in mechanically ventilated patients.

1 Case Presentation

A 3-year-old boy with metatropic dysplasia under home ventilation via tracheostomy was admitted to the pediatric intensive care unit for severe coronavirus disease-2019 pneumonia. He underwent mechanical ventilation in the lateral decubitus position due to severe kyphoscoliosis and a narrow thorax. On day 10, pneumonia exacerbation was documented by computed tomography scan findings of diffuse ground-glass opacities. A follow-up computed tomography scan on day 14 showed continuous pneumoretroperitoneum (Fig. 1) from the pneumomediastinum (Fig. 2). There were no pathological findings in the abdomen that explained the presence of air in the retroperitoneal space.

Air travels through the anatomical fascial surface to other compartments. Several rare cases of pneumomediastinum secondary to pneumoperitoneum or pneumoretroperitoneum have been reported¹. Pneumoretroperitoneum attributed to pneumomediastinum is less frequently observed². This is the first report of pneumoretroperitoneum arising from pneumomediastinum in a patient with coronavirus disease-2019. In this case, postural changes and positive pressure ventilation likely contributed to the movement of air from the mediastinum into the retroperitoneal space.

Author Contributions

Masashi Taniguchi: wrote the first draft of the manuscript. Each author listed on the manuscript: has seen and approved the submission of this version of the manuscript and takes full responsibility for the manuscript.

References

- [1] Elmoheen A, Haddad M, Bashir K, Salem WA. Subcutaneous emphysema, pneumothorax, pneumomediastinum and pneumoperitoneum after upper gastrointestinal endoscopy. *BMJ Case Rep.* 2020;13:e236369.
- [2] Kim JB, Jung HJ, Lee JM, Im KS, Kim DJ. Barotrauma developed during intra-hospital transfer -a case report-. *Korean J Anesthesiol.* 2010; 59 (Supl.):S218–21.