



# Non-Surgical Pneumoperitoneum: Exceptional Situation of Multiple Etiologies

Fdil Mohamed<sup>1,2\*</sup>, Bouassria Abdeslam<sup>1,2</sup>, Hicham El Bouhaddouti<sup>1,2</sup>, El Bachir Benjelloun<sup>1,2</sup>, Ouadii Mouaqit<sup>1,2</sup>, Abdelmalek Ousadden<sup>1,2</sup>, Khalid Ait Taleb<sup>1,2</sup>

<sup>1</sup>Faculty of Medicine and Pharmacy, Sidi Mohamed Ben Abdellah University of Fez, Fez, Morocco

<sup>2</sup>Visceral Surgery Department A, University Hospital Center Hassan II, Fez, Morocco

Email: \*mohamed.fdil89@gmail.com

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## Abstract

Pneumoperitoneum is usually related to the perforation of an abdominal viscus and requires immediate surgery. However, rare cases of spontaneous pneumoperitoneum occur outside of this context. Etiologies are multiples, and the approach is conservative. We report a case of a patient who presented non-surgical pneumoperitoneum. He progressed well under non-operative treatment. We discuss the different etiologies of this pathological entity.

## Subject Areas

Surgery, Surgical Specialties

## Keywords

Pneumoperitoneum, Spontaneous, Non-Surgical Management

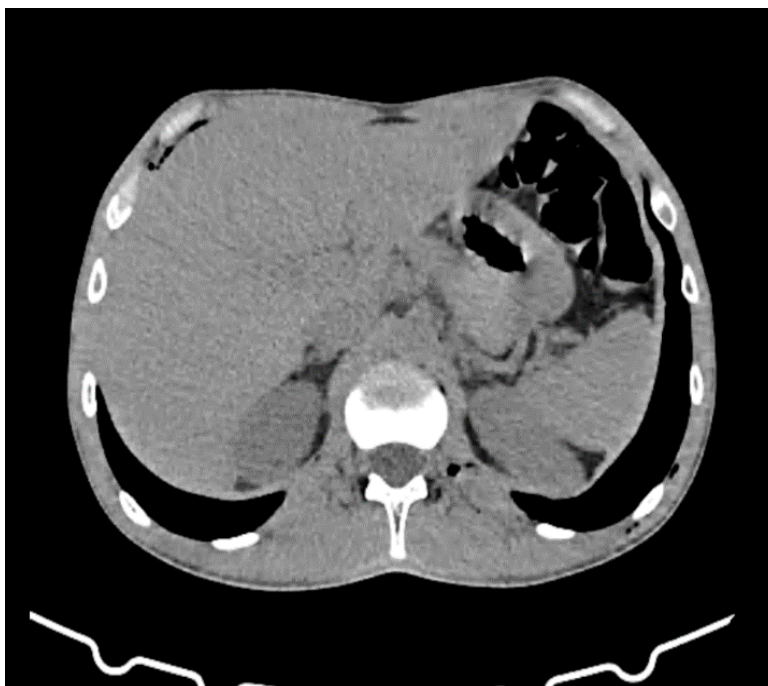
## 1. Introduction

Pneumoperitoneum is a surgical emergency usually related to the perforation of an abdominal viscus [1]. Sometimes, a pneumoperitoneum may occur without perforation. Then it is described as spontaneous, iatrogenic, or linked to thoracic, abdominal, or gynecological causes. In these cases, it's generally managed conservatively [2]. It is a diagnostic and therapeutic dilemma for the surgeon [3]. We report the case of a patient who presented with non-surgical pneumoperitoneum. Then, we discuss the different etiologies of this pathological entity.

## 2. Observation

A 39-year-old patient, tobacco sniffer, and never operated, was admitted to the emergency room for intermittent epigastric pain evolving in a feverish context

for three days. Clinical examination found a conscious patient, hemodynamically and respiratory stable. The temperature was 38.1°C, pulse 98/min, and blood pressure 130/80mmHg. The abdomen was slightly distended with epigastric tenderness. Laboratory investigations showed that the white blood cell count was 12,000/mm<sup>3</sup>, and the CRP level was 40 mg/dl. The plain abdominal X-ray demonstrated neither pneumoperitoneum nor gas-fluid levels. Thoracoabdominal CT scan showed a pneumomediastinum with pneumoperitoneum and subcutaneous cervical emphysema, without intraperitoneal effusion (**Figure 1, Figure 2**). There



**Figure 1.** CT scan showing the pneumoperitoneum.



**Figure 2.** CT scan showing pneumomediastinum and subcutaneous emphysema.

was no intestinal perforation. A thoracic origin was evoked considering radiological and clinical presentation. So, non-operative management was decided. The patient was put under close medical surveillance with good clinical and biological evolution.

### 3. Discussion

Pneumoperitoneum is a surgical emergency in 90% of cases, and in the remaining 10% of cases, pneumoperitoneum is due to non-surgical causes [1] [2]. The diagnosis is difficult given the difficulty to exclude an intestinal perforation. The absence of fever and abdominal tenderness or guarding should be associated with the absence of a significant biological infectious syndrome, and with the absence of intraperitoneal effusion, or the enhancement of the peritoneal layers on the radiological findings to exclude an intestinal perforation [4] [5].

The causes of spontaneous pneumoperitoneum are variable and multiple. It can be due to thoracic, abdominal, or iatrogenic origin. Gynecological origin and idiopathic origin are also evoked [1] [2] [4] [5]. The intrathoracic causes are dominated by: traumatic pneumothorax, barotrauma, broncho-peritoneal fistulas, severe destructive lesions of the parenchyma (pneumonia, malignant lesion), mechanical ventilation in Positive Pressure (PEEP) with possible coexistence of a pneumo-mediastinum and pneumopericardium, resuscitation maneuvers; the diffusion of gas from the alveoli into the peribronchovascular interstitium allows them to reach the mediastinum and then the retroperitoneum via the peri-aortic and peri-oesophageal interstitium [5] [6]. Abdominal causes are mainly represented by chronic intestinal cystic pneumatosis, where the pneumoperitoneum can be massive and recurrent. Subclinical perforation of a hollow viscus can induce a pneumoperitoneum. Some perforations heal, seal and only allow a small amount of gas to escape, without having infectious consequences [2] [5].

The gynecological origin is explained by vaginal insufflations, knee-chest exercises in the postpartum, inflammatory diseases of the pelvis, coitus, and high pressure vaginal douching [1] [2].

After gastrointestinal endoscopy, a persistent pneumoperitoneum may occur. The duration of this iatrogenic pneumoperitoneum varies between 7 days and 21 days according to some publications. Gynecological examination and vaginal diagnostic and therapeutic techniques can also lead to pneumoperitoneum [2].

In certain situations, the pneumoperitoneum will be qualified as idiopathic, when the etiological assessment returns negative, excluding other causes of pneumoperitoneum [3].

Through this case, and in front of a pneumoperitoneum, we emphasize the importance of history and a thorough physical examination and the appropriate paraclinical examinations to identify the non-surgical pneumoperitoneum and to avoid an unnecessary laparotomy by choosing a conservative treatment, and adopting rigorous and close monitoring, so as not to miss a surgical emergency.

## 4. Conclusion

Spontaneous pneumoperitoneum should be well-known, even if it remains rare, because it exposes to unnecessary surgical interventions, in front of the possibility of an applicable conservative approach and requires a well-directed investigation of the possible causes.

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

- [1] Karaman, A., Demirbilek, S., Akin, M., Gürünlüoğlu, K. and Irşi, C. (2005) Does Pneumoperitoneum Always Require Laparotomy? Report of Six Cases and Review of the Literature. *Pediatric Surgery International*, **21**, 819-824. <https://doi.org/10.1007/s00383-005-1489-3>
- [2] Williams, N.M. and Watkin, D.F. (1997) Spontaneous Pneumoperitoneum and Other Nonsurgical Causes of Intraperitoneal Free Gas. *Postgraduate Medical Journal*, **73**, 531-537. <https://dx.doi.org/10.1136/pgmj.73.863.531>
- [3] Hannan, E., Saad, E., Hoashi, S. and Toomey, D. (2019) The Clinical Dilemma of the Persistent Idiopathic Pneumoperitoneum: A Case Report. *International Journal of Surgery Case Reports*, **63**, 10-12. <https://doi.org/10.1016/j.ijscr.2019.08.015>
- [4] Alassaf, M. (2015) Recurring Spontaneous Aseptic Pneumoperitoneum Presenting Secondary to an Unrelated Chief Complaint: A Case Report. *International Journal of Surgery Case Reports*, **7**, 96-98. <https://doi.org/10.1016/j.ijscr.2014.10.038>
- [5] Adachi, W., Matsushita, T., Yashiro, Y., Imura, J., Shiozawa, H. and Kishimoto, K. (2020) Clinical Characteristics of Pneumoperitoneum with Pneumatosis Intestinalis Detected Using Computed Tomography: A Descriptive Study. *Medicine*, **99**, 322461. <https://doi.org/10.1097/md.00000000000022461>
- [6] Wang, H. and Batra, V. (2018) Massive Pneumoperitoneum Presenting as an Incidental Finding. *Cureus*, **10**, e2787. <https://doi.org/10.7759/cureus.2787>