Spontaneous pneumomediastinum: case report

Flávia Helena Monteiro Andrade Semedo[1], Rosário Santos Silva[1], Sónia Pereira[1], Teresa Alfaiate[2], Teresa Costa[2], Pilar Fernandez[2], Amélia Pereira[3]

[1] Medical Resident in Internal Medicine, Hospital Distrital da Figueira da Foz, EPE, Portugal
[2] Hospital Assistant in Internal Medicine, Hospital Distrital da Figueira da Foz, EPE, Portugal
[3] Hospital Assistant, Internal Medicine Graduate; Director of the Internal Medicine Service of Hospital Distrital da Figueira da Foz, EPE, Portugal

Summary

Objective: The description of this case is due to the rarity of this clinical entity and its semiotic diversity, which implies a high level of suspicion for a correct diagnosis. **Methods:** Description of a clinical case, based on the data referred to in the clinical process. **Results:** The case describes a young male patient, attended to at the emergency room due to right chest pain, which further investigation revealed to be consistent with spontaneous pneumomediastinum. He underwent medical treatment, with favorable outcome. **Conclusion:** The clinical course is usually benign, self-limited, involves only conservative treatment, and use of drugs is recommended only in symptomatic patients.

Keywords: Pneumomediastinum diagnosis; subcutaneous emphysema; mediastinal emphysema.

Study conducted at Hospital Distrital da Figueira da Foz, EPE, Medical Service, Portugal

Submitted on: 09/29/2011
Approved on: 02/02/2012

Correspondence to:
Flávia Helena Monteiro Andrade Semedo
Hospital Distrital da Figueira da Foz EPE
Serviço de Medicina
Gala 3094-001
Figueira da Foz, Portugal
fhsemedo@hotmail.com

Conflict of interest: None.

Introduction

Pneumomediastinum is defined by the presence of air in the mediastinum. The main causes are trauma, invasive procedures (cervical, thoracic, or abdominal), tracheobronchial or esophageal-bronchial fistulas, Valsalva maneuver, positive-pressure ventilation, coughing, vomiting, physical exertion, and inhaled drug use, among others[1]. It rarely occurs in the absence of pulmonary disease or other precipitating factors. In this case, it is referred to as spontaneous pneumomediastinum (SPM)[2].

SPM is rare in adults, with young male individuals being the most frequently affected, with a male/female ratio of 8 to 1[1]. The number of cases per hospital admissions ranges from 1 in 800 to 1 in 42,000[3]. Of these cases, approximately 1% have a history of asthma[1].

The main associated symptoms are chest pain, dyspnea, coughing, dysphonia, dysphagia, and cervical pain[1]. The presence of crackles on heart auscultation, described by Hamman in 1939 and named the Hamman sign, is uncommon, albeit pathognomonic[4]. Subcutaneous crackles are more often observed[3].

The diagnosis is established by imaging techniques, especially chest x-ray and computed tomography of the chest (chest CT). It is usually self-limited, which justifies only symptomatic relief.

Methods

Description of a clinical case, based on the data referred to in the clinical process.

Results

The case describes to a young male individual, 21 years old, treated at the emergency room for localized pain in the right hemithorax, of pleuritic type, with a two-day evolution. He denied other symptoms. He reported a recent episode of acute tracheobronchitis, for which he had been treated with antibiotics (amoxicillin/clavulanate 875/125 mg every 12 hours). The patient had a history of childhood asthma, received no current medications, was a nonsmoker, and denied using illicit drugs.

The patient was afebrile, acyanotic, polypneic (with a respiratory rate of 26 breaths/minute), and normotensive; the pulmonary auscultation showed globally decreased breath sounds and widespread wheezing; cardiac auscultation was normal and no murmurs were audible, with palpable subcutaneous crepitations in the hemithorax and right supraclavicular region, and normal abdomen. A postero-anterior chest X-ray showed a slight layer of air surrounding the cardiac silhouette, right chest wall, and ipsilateral supraclavicular region. The chest CT showed subcutaneous emphysema in the chest wall and right supraclavicular region, and presence of air surrounding the mediastinal structures (Figure 1); a bronchoscopy was performed to exclude the presence of tracheobronchial fistula or other lesions.

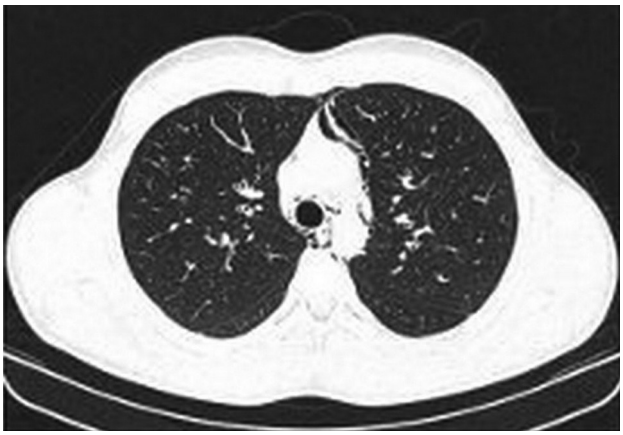

Figure 1 – Chest CT showing the presence of air in the mediastinum.

Thus, the diagnosis of SPM was attained. The patient was hospitalized and treated with inhaled bronchodilators, analgesics, and maintained on the previously prescribed antibiotics.

There was clinical and radiological improvement; the patient was discharged on the 5th day of hospitalization and referred to the pulmonology department for consultation. During this follow-up period there were no signs of recurrence.

Discussion

The physiopathological aspects involved in SPM were initially described by Macklin in 1944[1-4]. He considered that the underlying factor was the rupture of terminal alveoli secondary to increased alveolar pressure, with consequent leakage of air into the peribronchial interstitial space and, from there, to the hilum and mediastinum. The air in the mediastinum can cross through the fascia and spread to the subcutaneous tissue of the chest and cervical regions, retropharyngeal space, peritoneum, retroperitoneum, and pericardium.

This case shares many aspects with most cases reported in the literature, particularly regarding the form of presentation, therapeutic approach and clinical evolution. Chest pain, although nonspecific, is the most frequently involved symptom and when associated with dyspnea, it is present in approximately 82% of cases[5]. The presence of the Hamman sign is highly variable (probably due to the subjectivity of its detection), and subcutaneous emphysema is often the only perceived alteration.

Regarding the diagnostic investigation, chest X-ray is the method of choice; however, the postero-anterior view establishes the diagnosis in only half of the cases, making it important to obtain a profile view, allowing for the diagnosis in approximately 100% of cases[6]. A chest CT allows

the clarification of situations in which the chest X-ray is not conclusive. It also allows for the assessment of the extent of disseminated air and for ruling out other associated lesions. The performance of other tests is justified if there is suspicion of underlying factors or in case of other diagnostic hypotheses[7].

In the case described, it was necessary to perform a bronchoscopy to rule out the presence of tracheobronchial fistula, taking into account the previous diagnosis of acute tracheobronchitis.

Therapy consists of rest and symptomatic relief with analgesics, bronchodilators, and oxygen therapy if there is respiratory failure. Most cases have a favorable clinical course, with complete passive reabsorption of air[1].

Complications rarely occur, and include pneumothorax/hypertensive pneumomediastinum, which may justify surgical procedures.

The risk of recurrence is low and, to date, only one case has been reported[5].

In the case described, the patient is being followed at the pulmonology department, with no recurrence. The asthma reactivation after the SPM episode is noteworthy, for which the patient has maintained treatment with bronchodilators, with good clinical response and no further exacerbation episodes.

Conclusion

In conclusion, it must be emphasized that, despite the nonspecific nature of symptoms often associated with SPM, detailed physical examination may reveal signs suggestive of this condition, namely the Hamman sign and subcutaneous crepitations.

It must be remembered that the diagnosis is by exclusion and that it is essential to rule out other underlying causes through a detailed clinical history and complementary examinations appropriate to the patient's clinical context.

References

1. Fautureto MC, Santos JP, Goulart PE, Maia S. Pneumomediastino espontâneo: asma. Rev Port Pneumol. 2008;14:437-41.
2. Yellin A, Gapany-Gapanavivius M, Lieberman Y. Spontaneous pneumomediastinum: is it a rare cause of chest pain? Thorax.1983;38:383-5.
3. Newcomb A, Clarke P. Spontaneous pneumomediastinum: a benign curiosity or a significant problem. Chest. 2005;128:3298-302.
4. Choo MJ, Shin SO, Kim JS. A case of spontaneous cervical and mediastinal emphysema. J Korean Med Sc. 1998;13:223-6.
5. Ferreira LM, Haguette E. Enfisema retrofaríngeo e pneumomediastino espontâneos. Int Arch Otorrinolaryngol. 2007;337-40.
6. Lopes F, Marchiori E, Zanetti G, Silva TFM, Herranz LB, Almeida MIB. Pneumomediastino espontâneo após esforço vocal: relato de caso. Radiol Bras. 2010;43:137-9.
7. Martí J, Estirado C. Neumomediastino espontâneo asociado a inhalación de SPEED. Ann Med Intern. 2006;23:506-7.
8. Iyer V, Josh Y, Ryu J. Spontaneous pneumomediastinum analysis of 62 consecutive adult patients. Mayo Clin Proc. 2009;84:417-21.
9. Ruiz-Ruiz F, Sampériz A, Rubio T, Escolar F. Neumomediastino espontâneo. An Sist Sanit Navarra. 2006;29:1-4.
10. Terrosu G, Rossetto A, Bresadola V, Robiony M. Spontaneous retropharyngeal and mediastinal emphysema: case report. Int J Pediatr Otorhinolaryngol. 2010;5:108-10.