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CASE REPORT

Pulmonary Hyalinizing Granuloma: A Rare and Challenging Case

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Abstract

Hyalinizing Pulmonary Granuloma (HPG) is a rare pseudoneoplastic pulmonary lesion requiring histopathological diagnosis, often challenging for pathologists. We present the case of a 54-year-old woman with an incidental HPG diagnosis. She had a history of urogenital tuberculosis but no prior pulmonary involvement. Macroscopic examination revealed a 35-mm firm nodular lesion, while histology showed eosinophilic, hyalinized lamellae concentrically arranged around blood vessels, interspersed with histiocytes, lymphocytes, and plasma cells. Congo red staining was negative. Pathologists should consider HPG when the morphology is suggestive. Diagnosis of HPG relies on collaboration between pathologists, surgeons, and radiologists.

Keywords

Hyalinizing granuloma, Pathology, Pulmonary nodule, Pseudo neoplasm, Pseudo amyloid lesion

Abbreviations

PHG: Pulmonary Hyalinizing Granuloma; H&E: Hematoxylin and Eosin

Introduction

Pulmonary hyalinizing granuloma (PHG) is a non-neoplastic, and non-infectious pulmonary disorder [1]. Histologically, it is characterized by homogeneous, hyalinized, concentric lamellae of collagen, interspersed with histiocytes, plasma cells, and lymphocytes [2,3]. The pathophysiology of PHG remains uncertain [2,3]. Current hypotheses suggest it involves an exaggerated immune response to an aggression [2,3]. Fujita, et al. propose that PHG represents the end stage of an underlying pathological process [3]. PHG is an uncommon entity, typically presenting as single or multiple pulmonary nodules that can mimic malignancy [1,4]. Definitive diagnosis depends on histopathological evaluation [2,3], and that can be challenging for pathologists [5]. In this report, we present a case of PHG diagnosed at the anatomic pathology laboratory of Ibn Rochd University Hospital, Casablanca. The objective is to discuss the clinicopathological features of PHG and highlight the diagnostic challenges associated with this entity.

Case Description

A 54-year-old female patient was referred to the thoracic surgery department following the incidental discovery of a pulmonary nodule. She was asymptomatic, with no respiratory or extrapulmonary complaints. Her past medical history included urogenital tuberculosis treated at the age of 20, with no history of pulmonary tuberculosis or other respiratory conditions. She had no history of diabetes, hypertension, malignancy, autoimmune disorders, hematological diseases, or other significant comorbidities. The patient was a non-smoker with no history of occupational exposure to respiratory hazards. Physical examination revealed no abnormalities.

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The Following Diagnostic Workup was Performed

- **Chest CT scan:** A 22 × 20 mm, homogeneous, focal calcified nodule was found in the left lower lobe, with no other abnormalities, including no mediastinal lymphadenopathy.
- **Gene Xpert:** Negative
- **Bronchoscopy:** No abnormalities.
- **Complete blood count (CBC):** No anemia (Hb = 14.3 g/dL), no leukocytosis (7,700 cells/µL), no thrombocytosis (335,000 platelets/µL).
- **Fasting blood glucose:** 1 g/dL
- **Urea:** 0.24 g/L
- **Serum creatinine:** 8 mg/L

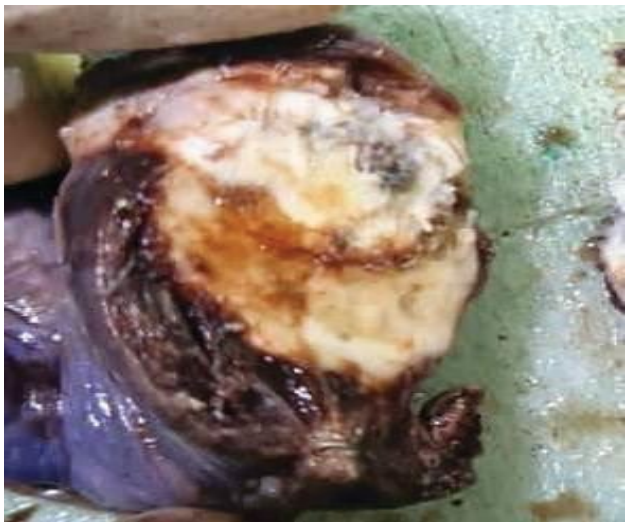

Figure 1: Macroscopic appearance of the nodule.

Bronchopulmonary carcinoma was initially considered as the primary diagnosis following a multidisciplinary consultation. To establish a definitive diagnosis, a diagnostic wedge resection was performed.

Gross description (Figure 1)

Macroscopic examination found nodular lesion measuring 3.5 cm in the largest diameter, with alternating whitish and brownish areas and foci of calcifications.

Histological description (Figure 2)

Histological examination revealed homogeneous, hyalinizing, eosinophilic lamellae arranged concentrically around blood vessels. These lamellae were interspersed with histiocytes, lymphocytes, and occasional giant cells. The lesion was well demarcated from the surrounding lung parenchyma, separated by a dense lymphocytic infiltrate. No evidence of tumor proliferation was found.

Congo red staining was performed and yielded a negative result. Based on these findings and following a multidisciplinary discussion, a diagnosis of hyalinizing pulmonary granuloma was established. The patient did not receive any specific treatment and remained asymptomatic.

Discussion

The first case of PHG was described by Benfield, et al. in 1964 [6] and later recognized as a distinct entity by Engleman, et al. in 1977 [7]. The rarity and mysterious nature of PHG motivated us to report this case. PHG is a benign fibrosclerosing condition with no specific clinical

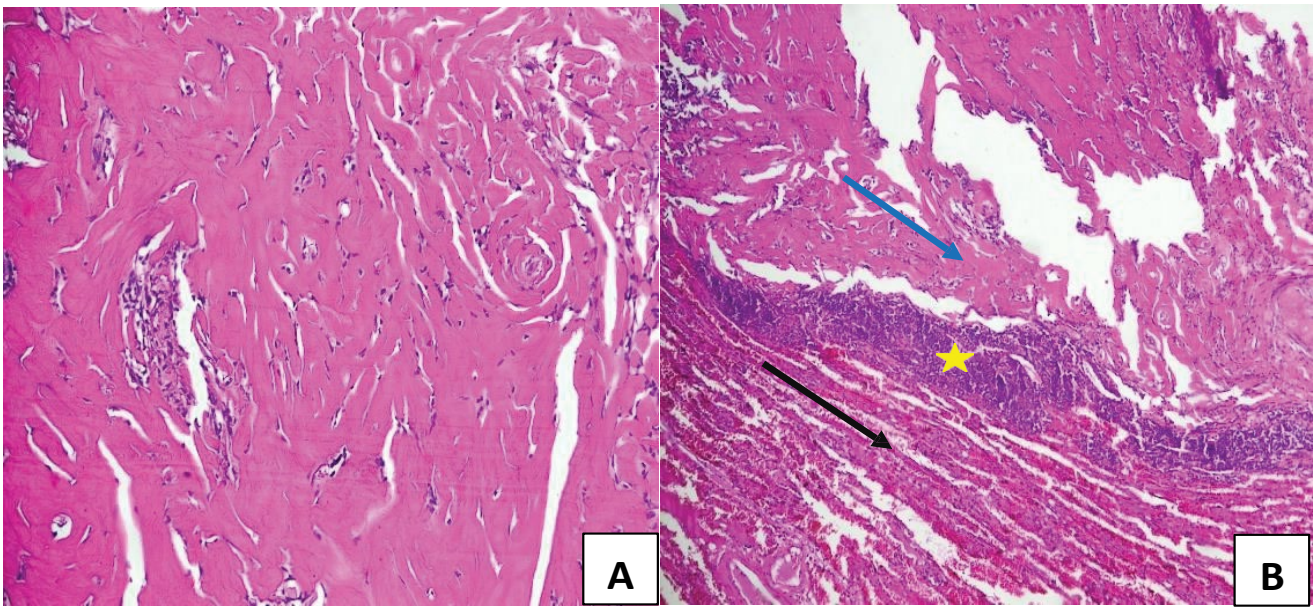

Figure 2: Histological features of the lesion. (A) Homogeneous, hyalinizing, eosinophilic lamellae arranged concentrically around blood vessels (H&E stain, x100); (B) Sharp demarcation of the lesion [blue arrow] from the surrounding lung parenchyma [black arrow], with a dense lymphocytic infiltrate at the interface [yellow star] (H&E stain, x40).

or radiological features [1,2,8,9]. It most commonly affects middle-aged adults, with no gender predilection [2,3,9]. Patients may present with mild symptoms such as cough, dyspnea, or fatigue, although many remain asymptomatic [2,8]. PHG can occur alongside various diseases, including infectious, autoimmune, malignant, hematological, or other fibrosclerosing conditions [2,3]. Tuberculosis is one possible associated condition [8,10]. Although our patient had no history of pulmonary tuberculosis, her prior urogenital tuberculosis suggests this association could be relevant in the etiopathogenesis of PHG. Radiologically, PHG typically presents as a pulmonary nodule [1,3]. These nodules may be multiple, resembling pulmonary metastases [10,11], or solitary, mimicking a primary pulmonary neoplasm [12]. PET scans provides limited diagnostic utility, as 60% of PHG nodules exhibit hyper metabolism [2,9,10].

Pathologically, PHG primarily affects the pulmonary parenchyma [4,12]. However, extrapulmonary localizations have also been reported [2,13]. Grossly, PHG typically presents as a nodule or mass with the following characteristics: A variable size ranging from a few millimeters to 15 cm, with an average size of 2 cm [5,9], firm consistency [4], and a grayish- white color [14]. The lesion may have a regular or irregular shape, calcifications, and occasionally featuring cavitations [9,12]. Histopathologically, PHG falls into the category of solid nodular lesions with hyalinizing collagenous fibrosis [5]. It is characterized by a distinct architectural pattern: Concentric lamellae of homogeneous, hyalinizing collagen arranged perivascularly [1,2,15]. Interspersed within these lamellae are histiocytes, plasma cells, lymphocytes, and a few giant cells [2,12,15]. Histochemically, PHG is negative for Congo red staining [9], while Masson's trichrome stain confirms the collagenous nature of this lesion [15,16].

The diagnosis of PHG can only be confirmed through histopathological examination [2,3]. A radioguided biopsy or surgical resection is essential for making the diagnosis [2,9], while bronchoalveolar lavage and transbronchial biopsy are not helpful [9,12,15]. Histopathological diagnosis of PHG remains challenging [5,14], as this condition is not well known by pathologists and also by clinicians [1,4]. Examining a pulmonary lesion suspected to be malignant, when it is actually benign, is a common scenario for pathologists [4]. In such cases, PHG should be considered if the morphological features are suggestive [4]. The main differential diagnosis is nodular pulmonary amyloidosis, which can be differentiated by Congo red positivity [4,5,9]. Nodular pulmonary amyloidosis is characterized by marked calcifications, osseous metaplasia, and a prominent giant cell reaction [1,4,5]. Ultimately, the diagnosis relies primarily on histology, but correlation with clinical and radiological data is essential [1,4,5,10]. PHG generally has a favorable prognosis [2,9]. The nodule may remain stable or increase in size very slowly [1,9]. Therapeutically, follow-up is usually sufficient [2,9]. Steroids seem to be effective in cases of symptoms [2,3,9]. Surgery is curative, but recurrence can occur [1,9].

Conclusion

PHG is a rare, benign pulmonary condition with no specific clinical or radiological signs. It is often associated with various diseases, including infections, malignancies, autoimmune disorders, hematological conditions, and fibrosing diseases. The diagnosis is based on histopathological examination, which can be challenging. The histological appearance is characteristic, and pathologists should consider this diagnosis whenever the lesion's morphology is suggestive. The diagnosis relies primarily on histology, but correlation with clinical and radiological data is essential.

Conflicts of Interest

None.

Authors Contribution

All authors have contributed to the diagnosis, management and the manuscript preparation.

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