

Atypical revelation of atypical lung carcinoid; back pain after SARS-COV2 vaccination: A case report

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Abstract

Background: Carcinoids make nearly 2% of all lung tumors, and the typical carcinoid are more frequent than atypical carcinoid (AC).

Case presentation: We report a histologically confirmed AC case of a 23-years old male patient; revealed by back chest pain as the first presentation; after a covid vaccination. Past medical history revealed that the patient had received the covid-19 vaccine in the days before the presentation. Contrast-enhanced computed tomography scan of the thorax revealed a tumor mass of the right fowler.

Conclusion: To our knowledge; this is the first case in literature. Whether bronchial carcinoid tumors are infrequent; they should be considered as differential diagnosis in patients even younger, with recurrent respiratory symptoms as timely and quick diagnosis is essential for curative intervention. We reported a first a COVID-19 vaccine- revealing symptoms of a bronchial atypical carcinoid, the characteristics that led to this phenomenon stay unclear, more studies are needed.

Keywords: Atypical Carcinoid; Neuroendocrine Tumor; Lung Cancer; Case Report; Bronchoscopy; Covid

1. Introduction

Neuroendocrine tumors (NETs) are epithelial tumors with a prevalent neuroendocrine differentiation that may appear in different organs of the body; like: gastrointestinal tract, thymus, , ovary, and lung, the last is the second most common site after the gastrointestinal tract [1], the NETs accounting for 25% of primary lung tumors and 1-2% of malignant lung tumors [2].

The progress of knowledge about bronchial carcinoids is slower than gastrointestinal tumors, even the guidelines of experts are limited [3].

25-39% of patients are asymptomatic, they may have symptoms of bronchial obstruction, infection, or carcinoid syndrome [4].

Computed tomography scan is the recommended examination for the diagnosis of pulmonary carcinoids (PC), but pathological study is mandatory for their classification, the treatment of choice is surgery [2].

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2. Case presentation

We report the case of a 23-year-old man, nonsmoker. Past medical history revealed he had received the covid-19 vaccine in the month prior the presentation.

He presented a symptomatology evolving for 1 month, just starting after receiving the first dose of m-RNA COVID-19 vaccine; made of atypical continuous chest pain of moderate intensity irradiating in interscapular, with the appearance of an intermittent dry cough, without other thoracic or extra thoracic associates, including no dyspnea, or hemoptysis, in a context of apyrexia and conservation of the general state, with a performance status of WHO at 0.

At the clinical examination, the patient was conscious, his vitals were normal, and auscultation of lungs revealed normal vesicular breath sounds. His blood parameters were within normal limits. Sputum examination was negative for tuberculosis.

Chest X-ray showed a single lung mass of the right medial lobe, that was confirmed by chest computed tomography; showing a right fowler's lung mass, dense homogeneous, with clear lobulated contours, homogeneously enhanced after injection of contrast product, measuring 65*32 mm, with magmas of hilar lymphadenopathy estimated at 42*26 mm, sheathing the middle and lower lobe branches, and a 28 x 15-millimeter subcarinal lymphadenopathy (figure1,2).

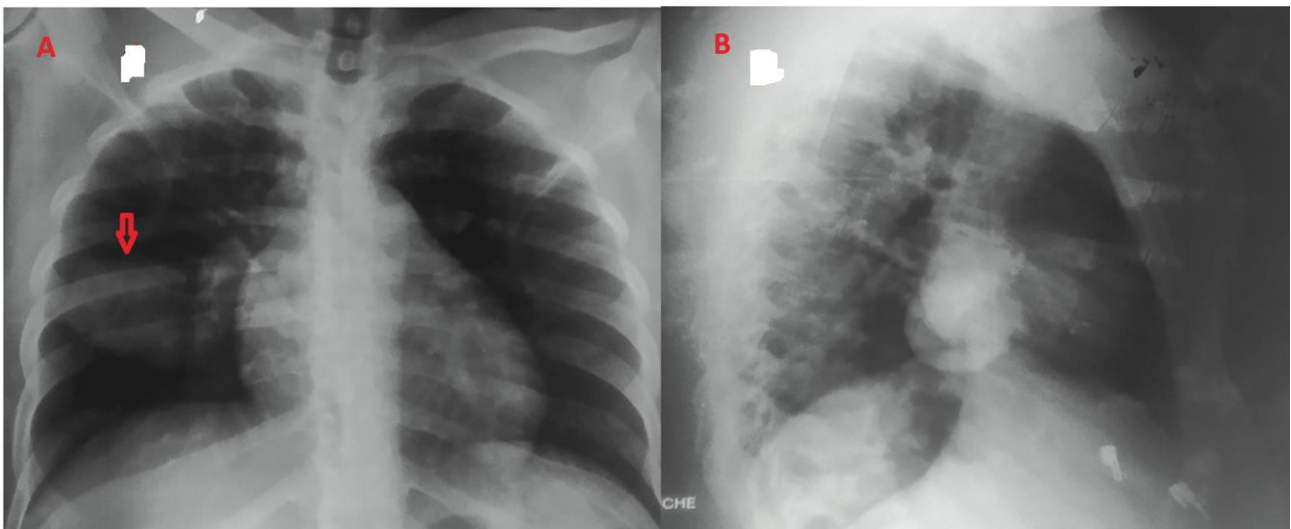


Figure 1 Chest X-ray in posteroanterior (A) and profile (B) views, showing a single lung mass of the right medial lobe.

On bronchoscopy: It found a smooth surface tumor obstructing the Nelson and compressing the basal pyramid, bleeding on contact with the bronchoscope, biopsies of the tumor and aspirations for cytodiagnosis were taken (figure 3).

The surface epithelial covering is ciliated pseudostratified, with squamous metaplasia in some places. the chorion is fibrous with a dense cell population, this one is made of diffuse layers and a few rosettes. the cells are small to medium in size with irregularly contoured hyperchromic nuclei. the cytoplasm is reduced and eosinophilic.

the cytological examination of the slides produced and stained with Papanicolaou shows against a minimal inflammatory background made up of lymphocytes and polynuclear neutrophils; the presence of often isolated bronchial cells, sometimes grouped together in clusters, they are most often dystrophic.

immunohistochemical study; an intense and diffuse granular cytoplasmic expression of cells suspicious of the anti-chromogranin antibody (clone LK2H10, Dako), moderate and diffuse granular cytoplasmic expression of the anti-synaptophysin antibody (Clone SY38, Dako), absence of expression of the anti-CD45 antibody (Leucocyte Common Antigen Clone 2B11+PD7/26, Dako), absence of expression of the anti-TTF1 antibody (Clone 8G7G3/1), an intense nuclear expression of 15% o of the anti-Ki67 antibody (Clone MIB-1). The morphological and immunohistochemical aspect was compatible with an atypical carcinoid tumor (Figure 4).

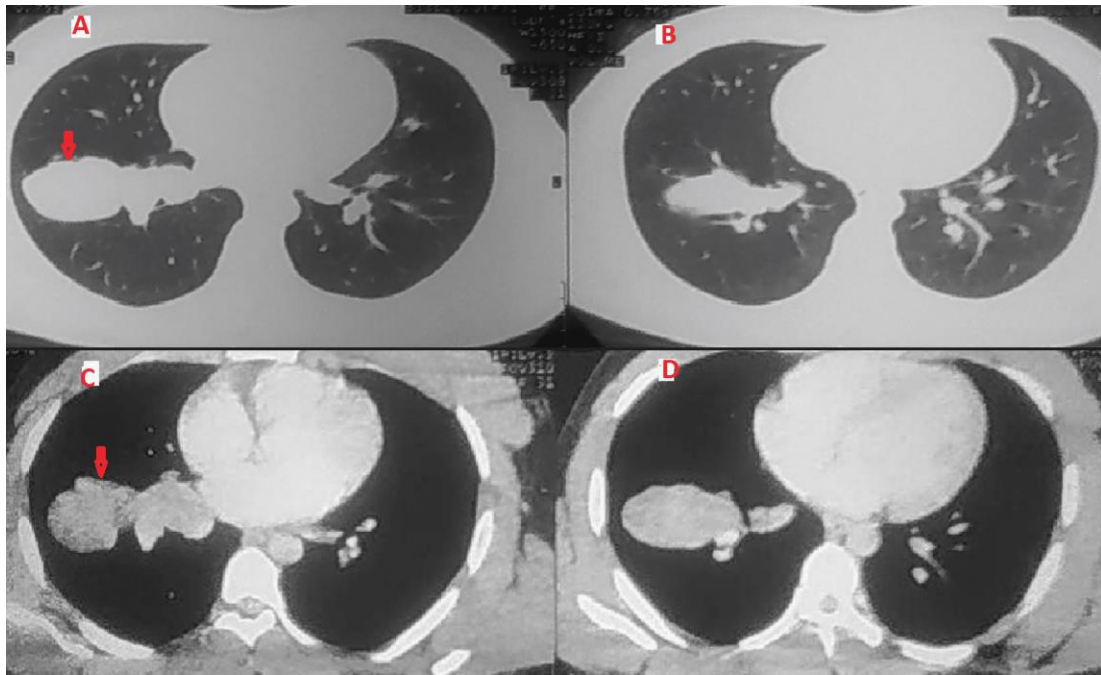


Figure 2 Chest CT scan in axial section (A+B = parenchymal window, C+D = mediastinal window), showing the mass

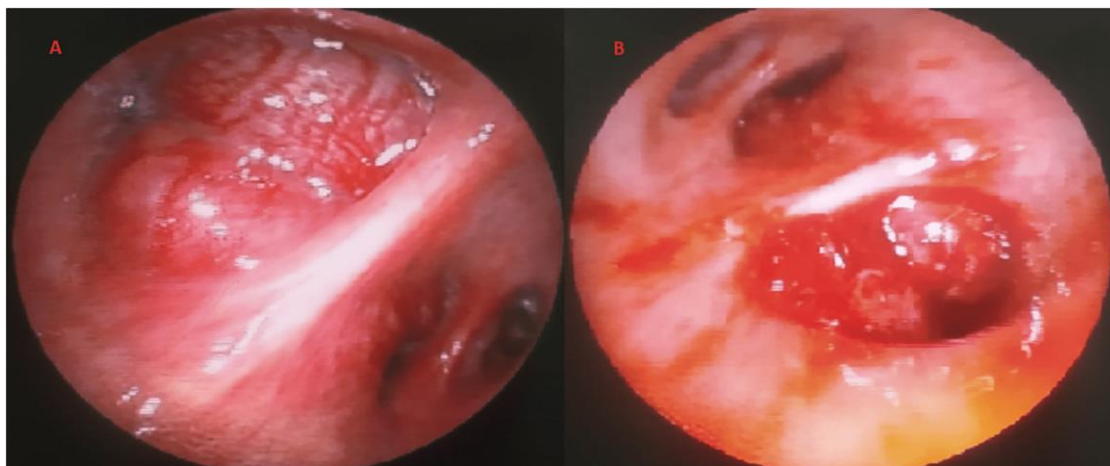


Figure 3 Endoscopic view of the obstructive endobronchial mass (before (A) and after (B) the biopsy).

Surgical treatment was proposed; a bi-lobectomy of the right lung (middle and lower lobe) was performed with lymphadenectomy. The patient was transferred to an intensive care unit after surgery with oxygen and analgesics.

Histopathologic study of the excised mass confirmed the first result, the final diagnosis being atypical bronchopulmonary carcinoid tumor, Resection margins were tumor free, but we objectified metastases in the ipsilateral hilar lymph nodes. the patient is proposed for discussion for adjuvant therapy.

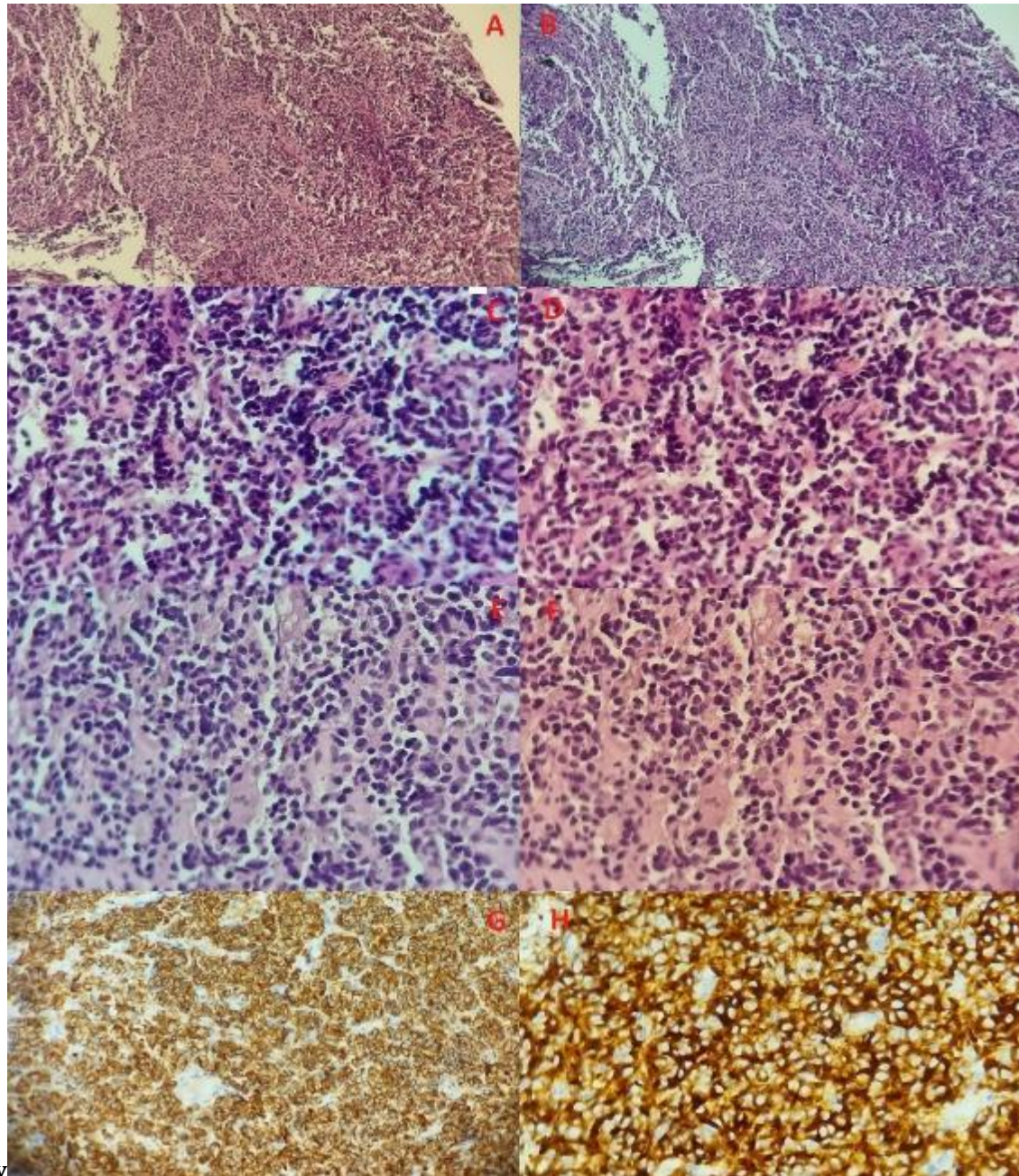


Figure 4 Histopathological features with different magnifications; Hematoxylin and Eosin (A,B,C et D)(x40,x100), Synaptophysin et Chromogranin A positivity (H)(x200), and cytokeratin (G)(x200)

Table 1 Summary of the case

1	Patient (gender, age)	Male, 23 year old
2	Final Diagnosis	Atypical Lung Carcinoid
3	Symptoms	evolving for 1 month ; atypical continuous chest pain of moderate intensity irradiating in interscapular, with the appearance of an intermittent dry cough, in a context of apyrexia and conservation of the general state,
4	Medications	codeine
5	Clinical Procedure	clinical examination, Chest X-ray, bronchoscopy with biopsy
6	Specialty	Pulmonology, oncology

3. Discussion

Pulmonary carcinoid arises from neuroendocrine cells and constitutes 2.5% of lung cancers, The prevalence of bronchial carcinoid has increased in past 30 years up to 6%/year, probably related to a better clinical appreciation and improvement of the various radiological and endoscopic diagnostic methods, females are affected more than males and bronchial carcinoid occurs mostly during fourth–fifth decades.[2]

Typical carcinoid is central carcinoid and may present with persistent cough, wheezing, chest pain, hemoptysis, and obstructive pneumonitis, atypical carcinoids are mostly peripheral carcinoid with lymphatic invasion and rarely present with any symptoms.[5] Our case here of atypical carcinoid is central.

While thoracotomy might be needed in more than 30% cases, CT-guided needle biopsy might also be performed [2]. As in our case, bronchoscopy plays a primary role in central locations, because the carcinoids are visible during endoscopic examination [6,7], especially flexible bronchoscopy, but the rigid bronchoscopy is requested in cases with a high risk of bleeding; both to collect biopsy fragments and to complete endoscopic examinations.

With the size of the tumor; our case looks had the tumor since long time without symptoms, a lot of typical carcinoids are in the central airways, so they cause a bronchial obstruction with hemoptysis, recurrent pneumonia, chest pain, and wheezing [8]. Because of the rarity of this tumor, generally it is not considered as differential diagnosis in young patients, with recurrent respiratory symptoms even with optimum medical treatment; that should indicate CT scan and bronchoscopy for quick diagnosis.

The lung's carcinoids may deliver corticotropin, vasoactive substances and growth hormone releasing hormone resulting in Cushing's syndrome, and carcinoid syndrome [8] respectively, and none of these were evident in our patient.

The bronchoscopy with biopsy are essential to differentiate typical and atypical Carcinoids, with the similar radiologic presentations [8,9].

For our patient we did right lung bilobectomy with regional lymph node resection, considering surgery is the only curative procedure for those patients, even with local nodal metastasis that does not exclude definitive surgical treatment [10,11].

The Majority of lymphadenopathies in the carcinoids are caused by a reactive inflammatory reaction and the histopathologic study of some resected lymph nodes may be negative for metastasis [8], even if that hilar and mediastinal lymph nodes are the most frequent metastatic sites for typical carcinoid.

COVID-19 vaccination is recommended for immunocompromised individuals, such as cancer patients, systemic reactogenicity following an intense innate immune response to the vaccines, resulting in tumor regression, which can occur in up to 69% of patients after vaccination with COVID-19 RNA-based vaccines [12]. New cancer treatment strategies are based on manipulation of the immune system and stimulation of anti-cancer immunity; a case has been described; of spontaneous regression of metastatic myoepithelial carcinoma of the salivary glands with grade 3 systemic reactogenicity, after vaccination with COVID-19 mRNA vaccine [12].

A recent metanalysis showed that Coronavirus disease 2019, has been shown to cause increased disease severity and mortality in patients with active cancer versus healthy individuals [13], and Vaccination is important in reducing COVID-19-associated morbidity and mortality [13]. Also the immunogenicity of vaccines was found to be lower in patients with cancer versus healthy individuals, and humoral immune responses were inferior in those with hematological versus solid cancers [13].

In addition, several papers have described incidental findings in patients with COVID-19 vaccines, especially hypermetabolic axillary lymph nodes (HMNs) ipsilateral to the COVID-19 vaccine injection site, which may pose some diagnostic problems [14].

To our knowledge, this is the first reported case of COVID-19 vaccine- revealing and increasing symptoms of a tumor, especially a bronchial atypical carcinoid, host and tumor characteristics that led to this phenomenon stay unclear, more studies are needed to confirm the findings.

List of abbreviation

- AC: atypical carcinoid
- NETs: Neuroendocrine tumors
- PC: pulmonary carcinoid

4. Conclusion

To our knowledge, this is the first case in literature. Whether bronchial carcinoid tumors are infrequent; they should be considered as differential diagnosis in patients even younger, with recurrent respiratory symptoms even with optimal medical treatment as timely and quick diagnosis is essential for curative intervention. Surgical resection is the principal method of treatment, we reported a first a COVID-19 vaccine- revealing symptoms of a bronchial atypical carcinoid, the characteristics that led to this phenomenon stay unclear, more studies are needed to explore the findings.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare no conflict of interest regarding the publication of this article.

Statement of informed Consent

Informed consent was obtained from the patient included in the study. The patient information was be kept confidential during and after study period.

Statement of Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Authors' contribution

Mohamed Ijim , Meryem Bougadoum, Mariem Hindi , Salma Ait Batahar and Lamyae Amro conceived the idea, provided the framework and edited the manuscript. MI performed the extensive literature search and wrote the initial drafts, and provided the clinical data and also searched the literature. All the authors contributed to the clinical care of this case, and they all approved the final manuscript.

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