CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 80 (2021) 105703

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Bronchial carcinoid tumor in the era of covid-19 pandemic: A case report

Esubalew Taddese Mindaye[a,*], Mulugeta Kassahun[b], Gulilat Tigiye[b]

[a] Department of Surgery, Saint Paul's Hospital Millennium Medical College, Swaziland Street, 1271, Addis Ababa, Ethiopia
[b] Department of Surgery, Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

ARTICLE INFO

Article history:
Received 4 February 2021
Received in revised form 22 February 2021
Accepted 22 February 2021
Available online 24 February 2021

Keywords:
Carcinoid tumor
Endobronchial
Covid-19
Lung cancer
Case report

ABSTRACT

INTRODUCTION: Bronchial carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors which arise from Enterochromaffin (Kulchitsky) cells. Early diagnosis is extremely important as the main stay of treatment is surgical excision.
PRESENTATION OF CASE: We present a rare case of bronchial typical carcinoid tumor in a 27-year-old male who presented with a complaint of intermittent dry cough of 2 weeks' duration associated with shortness of breath and low grade fever. He was initially misdiagnosed as covid-19 pneumonia and was admitted to covid-19 treatment center. Right lung bi-lobectomy with regional lymph node resection was done and he was discharged home in good condition.
DISCUSSION: Majority of typical carcinoids are located in the central airways leading to bronchial obstruction with recurrent pneumonia, chest pain and wheezing. In the era of covid-19 pandemic, lung cancer patients are at higher risk of being affected by covid-19 and, early identification and differential diagnosis is extremely difficult in the absence of comprehensive evaluation and work up as the clinical and imaging findings of covid-19 may resemble lung cancer. Although hilar and mediastinal lymph nodes are the most common metastatic sites for typical carcinoids most lymphadenopathies are caused by a reactive inflammatory reaction.
CONCLUSION: Bronchial carcinoids are rare, malignant neuroendocrine tumors with complete surgical resection being the only curative management. During the Covid-19 pandemic crisis, diagnosing rare lung diseases like carcinoid tumor is real challenge especially in resource limited set up and needs high index of suspicion with meticulous diagnostic work up. The outcome of typical carcinoids with lymph node metastasis is excellent with complete resection.

1. Introduction

Bronchial carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors which arise from Enterochromaffin (Kulchitsky) cells of the respiratory tract epithelial lining [1].They account for less than 2 % of all lung tumors [2] and predominantly arise within the lobar or segmental bronchus [3].Although no known carcinogen has been found, majority of patients diagnosed with carcinoid tumors are smokers [3].

Majority of carcinoid tumors have indolent behavior being asymptomatic in 25–39 % of patients. Centrally located tumors may present with symptoms of bronchial obstruction and superinfection. Features of carcinoid syndrome and crisis occur rarely in 1% of patients [4].

Early diagnosis is extremely important as the main stay of treatment is surgical excision and also determines the prognosis [3].For centrally located tumors Contrast enhanced chest CT scan may show characteristic 'gloved finger opacity' [5]. Fiber optic bronchoscopic biopsy with immunohistochemistry test for neuroendocrine markers is the best method for definitive diagnosis [3].

Surgical resection is the treatment of choice for patients with bronchial carcinoids with no evidence of systemic metastases [3].*The case report has been reported in line with the SCARE 2020 criteria* [6].

2. Case presentation

Twenty-seven years old male, postgraduate student presented with a complaint of intermittent dry cough of 2 weeks' duration associated with shortness of breath, low grade intermittent fever,

Abbreviations: CT, computerized tomography; IASCLC, International Association for the Study of Lung Cancer; RT PCR, Reverse Transcription Polymerase Chain Reaction; SPHMMC, St. Paul's Hospital Millennium Medical College; WHO, World Health Organization.

* Corresponding author.
E-mail addresses: esubetad24@yahoo.com (E.T. Mindaye), mulugeta.kassahun@yahoo.com (M. Kassahun), zemarugul@gmail.com (G. Tigiye).

https://doi.org/10.1016/j.ijscr.2021.105703

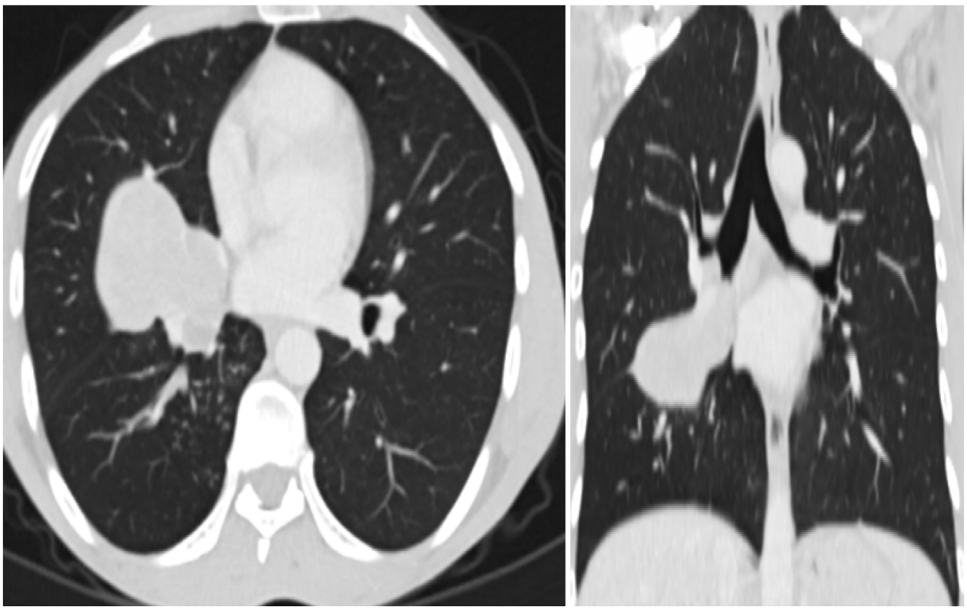

Fig. 1. Chest CT scan showing enhancing, lobulated right lung middle lobe soft tissue mass infiltrating bronchus intermedius.

night sweat and loss of appetite. He has no previous history of similar complaints, contact history with known pulmonary tuberculosis patients and have never smoked cigarettes. He has no history of drug allergy, self or family history of relevant medical or surgical illness. For his complaints he visited local hospital where he was diagnosed to have Corona virus infection (covid-19 pneumonia) and was admitted to treatment center but after admission repeated covid-19 tests were repeatedly negative despite his persistent symptoms for which he was referred to our tertiary care center, Saint Paul's Hospital Millennium Medical College(SPHMMC). On presentation his vital signs were in the normal range. He had decreased air entry over his right posterior lower third lung field. Otherwise, there was no remarkable finding on other systems evaluation.

His complete blood count, renal function test and serum electrolytes were in the normal range. His RT PCR (Reverse Transcription Polymerase Chain Reaction) test for covid-19 at our hospital was negative. Chest computerized tomography (Chest CT) showed 5cm × 4cm enhancing, lobulated, soft tissue mass in the middle lobe of the right lung. The mass has endoluminal extension to bronchus intermedius (Fig. 1). Bronchoscopic evaluation revealed red, fleshy and fragile right bronchus intermedius mass (Fig. 2), and tissue biopsy from the mass showed scattered discohesive atypical cells with eosinophilic cytoplasm and irregular nuclear border suggestive of infiltrates of carcinoma. Abdominal ultrasound examination didn't reveal evidence of liver secondary.

Fig. 1 Chest CT scan showing enhancing, lobulated right lung middle lobe soft tissue mass infiltrating bronchus intermedius.

With an impression of right lung middle lobe mass, the patient was operated through right posterolateral thoracotomy after getting informed written consent. The intraoperative finding was an 8cm × 6cm firm mass involving entire middle lobe and infiltrating long segment of bronchus intermedius (Fig. 3). There were multiple enlarged mediastinal lymph nodes involving stations 7, 8, 9 and 11. With these findings right lung bi-lobectomy (middle and lower lobe) with mediastinal lymphadenectomy of station7, 8, 9 and 11 was done and we left right tube thoracostomy.

Post procedure, he was transferred to intensive care unit and put on oxygen support as well as epidural analgesics. Subsequently, he had smooth recovery and was transferred to surgical ward. The chest tube output was insignificant and minor bubbling decreased

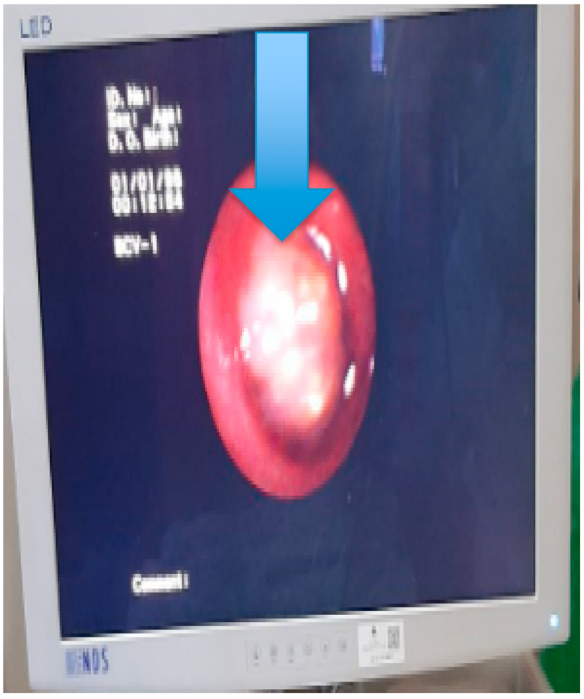

Fig. 2. Bronchoscopic picture showing obstructive bronchus intermedius endobronchial mass.

gradually. Control chest x ray taken on his 4th post op day showed well expanded right upper lobe for which the chest tube was removed.

Histopathologic study of the excised mass showed organized nests of uniform round cells with salt and pepper chromatin pattern and indistinct cytoplasm. There was no evidence of mitosis and necrosis the final diagnosis being typical bronchopulmonary carcinoid tumor (fig.4). The mediastinal lymph nodes were free of metastatic deposits.

Subsequently, the patient showed a remarkable improvement and was discharged from the hospital in a stable condition.

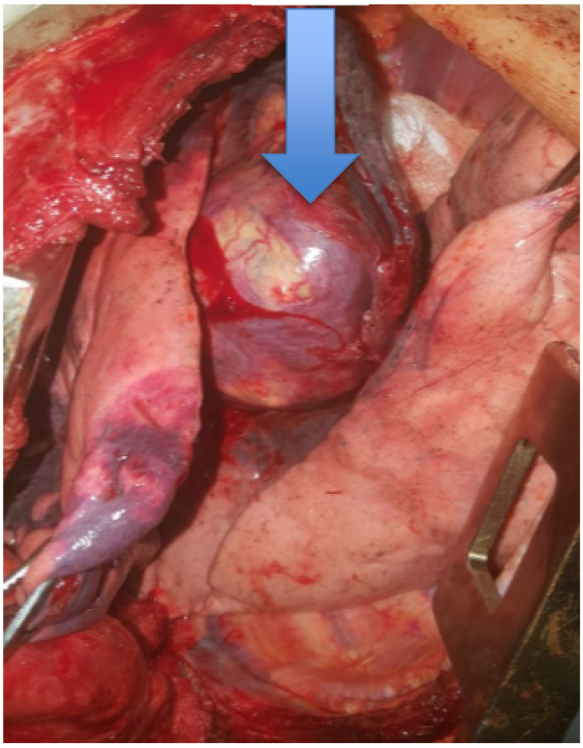

Fig. 3. Intra-operative picture showing 8cm × 6cm lobulated, firm, mass involving the right lung middle lobe.

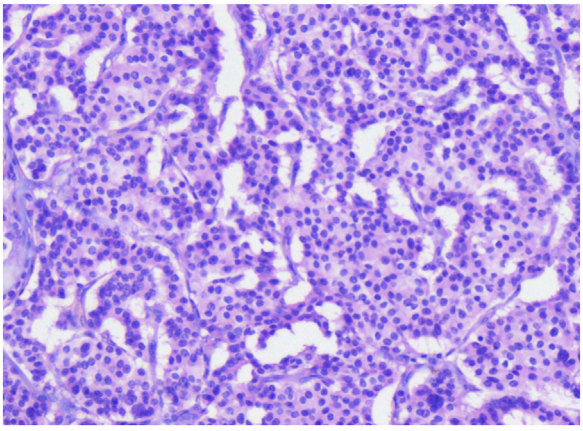

Fig. 4. Histologic section showing uniform round cells with salt and paper chromatin.

3. Discussion

Based on histologic differentiation the World Health Organization/The International Association for the Study of Lung Cancer (WHO/IASLC) classifies pulmonary Carcinoid tumors into: Typical carcinoids (76–90 %), less than 2 mitosis/2 $_{mm}$ [2] and no necrosis; Atypical carcinoid, increased mitosis(2–10 mitosis/2 mm^2) with confirmed necrosis [7,8]. In the era of covid-19 pandemic, lung cancer patients are at higher risk of being affected by covid-19 and, early identification and differential diagnosis is extremely difficult in the absence of comprehensive evaluation and work up as the clinical and imaging findings of covid-19 may resemble lung cancer [9]. The most common cause of death in lung cancer patients being infected with Covid-19 is complications associated with the covid-19 not the cancer itself, especially in indolent malignancies like carcinoid tumor [9]. With the limited data about lung cancer patients approach and management during covid-19 pandemic, undergoing invasive thoracic procedures like bronchoscopic biopsy and even once diagnosed undergoing open surgical therapy is very challenging as it increases patients and health care workers risk of infection with Covid-19 [9].Access to mechanical ventilators especially in resource limited areas like ours is also great challenge if the patients require respiratory support post operatively. We faced great difficulty to access bronchoscopic biopsy as the service is closed during the pandemic to prevent covid-19 transmission in the hospital.

Although the sensitivity and specificity of RT PCR for covid-19 is >95 %, false positivity rate is as high as 4% even in the best set ups like United kingdom mainly due to contamination and cross reaction [10].Our patient's first test result looks to be false positive. False positive result doesn't only lead to misdiagnosis but also creates anxiety among health care workers for which patients are denied of invasive procedures like bronchoscopy.

Majority of typical carcinoids are located in the central airways leading to bronchial obstruction with recurrent pneumonia, chest pain, wheezing and hemoptysis [5].Although urinary level of 5-HIAA and serum level of chromogranin A are elevated in patients with carcinoid tumor [3] we couldn't determine our patient's result.

Surgery is the only curative approach for patients with carcinoid tumors and lung saving surgeries are preferable especially for those tumors located peripherally [11]. Outcome of surgery is excellent even for patients with local nodal metastasis that does not preclude definitive surgical treatment [12].We also did right lung bilobectomy with regional lymph node resection for our patient. Although hilar and mediastinal lymph nodes are the most common metastatic sites for typical carcinoid, most lymphadenopathies are caused by a reactive inflammatory reaction [3].This could explain why histopathologic study of the resected lymph nodes in our patient were negative for secondaries.

Depending upon the degree of differentiation and lymph node metastasis typical Carcinoids have excellent prognosis than atypical carcinoids, with a 10-year survival rate of more than 80 % [3].Metastasis commonly occurs to mediastinal lymph nodes followed by liver [3].

Carcinoid tumors have poor response for adjuvant chemo and radiotherapy making complete resection of the tumor with regional lymph nodes the main stay of treatment. Our patient was not initiated in any form of adjuvant treatment and we are following him with clinical evaluation, radiologic imaging with chest CT scan and bronchoscopy as the chance of recurrence is higher for patients with larger tumor size. He has no evidence of recurrence or metastasis.

4. Conclusion

In the middle of Covid-19 pandemic crisis diagnosing rare lung diseases like carcinoid tumor is a real challenge and needs high index of suspicion and meticulous diagnostic work up. Surgical resection is the main stay of treatment for patients with no evidence of systemic metastasis. The outcome of typical carcinoid tumors with lymph node metastasis is excellent with complete resection but patients with larger tumor require cautious follow up post operatively as the chance of recurrence is relatively higher.

Declaration of Competing Interest

All authors declare that they have no conflict of interest

Funding

No funding

Ethical approval

Ethical Clearance was obtained from the Institutional Research and Ethics Review Committee (IRB) of SPHMMC for the publication of the case report and accompanying images.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

1. Esubalew Taddese Mindaye, MD
Conceived and conducted the study, did literature search and Critical revision of the manuscript, primarily involved in the management of the case
2. Mulugeta Kassahun, MD
Conducted over all supervision and critical revision of the manuscript
3. Gulilat Tigiye, MD
Conducted over all supervision and critical revision of the manuscript

Registration of research studies

Not Applicable

Guarantor

Esubalew Taddese Mindaye, MD

Provenance and peer review

Not commissioned, externally peer-reviewed

Acknowledgment

We want to thank our patient for consenting to the publication of the article.

References

[1] S. Nakashima, T. Hayashi, K. Ashizawa, K. Abe, N. Kinoshita, M. Anami, et al., Atypical Carcinoid Tumor of the Lung: Report of a Case with Intrapulmonary Metastasis, 2021, pp. 4.
[2] C.J. Lips, E.G. Lentjes, J.W. Höppener, The spectrum of carcinoid tumours and carcinoid syndromes, Ann. Clin. Biochem. 40 (6) (2003) 612–627.
[3] G.S. Kulkarni, S.C. Gawande, D.V. Chaudhari, A.P. Bhoyar, Bronchial carcinoid: case report and review of literature, MVP J. Med. Sci. 3 (February 1) (2016) 71, 29 [cited 2020 Oct 16], Available from: http://www.informaticsjournals.com/index.php/mvpjms/article/view/740.
[4] S. Chong, K.S. Lee, M.J. Chung, J. Han, O.J. Kwon, T.S. Kim, Neuroendocrine tumors of the lung: clinical, pathologic, and imaging findings, Radiographics 26 (1) (2006) 41–57.
[5] M.-Y. Jeung, B. Gasser, A. Gangi, D. Charneau, X. Ducroq, R. Kessler, et al., Bronchial carcinoid tumors of the thorax: spectrum of radiologic findings, RadioGraphics 22 (March 2) (2002) 351–365, http://dx.doi.org/10.1148/radiographics.22.2.g02mr01351 [cited 2020 Oct 16], Available from:.
[6] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, et al., The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.
[7] W.D. Travis, E. Brambilla, A.P. Burke, A. Marx, A.G. Nicholson, Introduction to the 2015 World Health Organization classification of tumors of the lung, pleura, thymus, and heart, J. Thorac. Oncol. 10 (9) (2015) 1240–1242.
[8] E. Lim, P. Goldstraw, A.G. Nicholson, W.D. Travis, J.R. Jett, P. Ferolla, et al., Proceedings of the IASLC international workshop on advances in pulmonary neuroendocrine tumors 2007, J. Thorac. Oncol. 3 (10) (2008) 1194–1201.
[9] C. Baldotto, A. Gelatti, A. Accioly, C. Mathias, E. Mascarenhas, H. Carvalho, et al., Lung Cancer and the COVID-19 pandemic: recommendations from the brazilian thoracic oncology group, Clinics 75 (2020) e2060 [cited 2021 Feb 21], Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7297526/.
[10] E. Surkova, V. Nikolayevskyy, F. Drobniewski, False-positive COVID-19 results: hidden problems and costs, Lancet Respir. Med. 8 (December 12) (2020) 1167–1168 [cited 2020 Dec 12], Available from: https://linkinghub.elsevier.com/retrieve/pii/S2213260020304537.
[11] S. Bölükbas, J. Schirren, Parenchyma-sparing bronchial sleeve resections in trauma, benign and malign diseases, Thorac. Cardiovasc. Surg. 58 (01) (2010) 32–37.
[12] N. Martini, M.B. Zaman, M.S. Bains, M.E. Burt, P.M. McCormack, V.W. Rusch, et al., Treatment and prognosis in bronchial carcinoids involving regional lymph nodes, J. Thorac. Cardiovasc. Surg. 107 (1) (1994) 1–7.