Endobronchial solitary mixed squamous cell and glandular papilloma: A rare cause of left main bronchus obstruction

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SUMMARY

Papillomas of the respiratory tract are generally multiple and arise from the upper respiratory tract. Solitary pulmonary papillomas (SPP), especially of the mixed variety are rarely seen. Here, we report a case of 55-year-old woman who presented with left upper lobe collapse. Bronchoscopy showed an exophytic mass with an irregular polypoidal surface in the left main bronchus. Endobronchial biopsy confirmed mixed squamous cell and glandular papilloma, which was treated with the bronchoscopic resection using an electrocautery snare and cryoprobe.

INTRODUCTION

Solitary pulmonary papillomas (SPP) of the lower respiratory tract are rare benign neoplasms. They account for <0.5% of all lung tumours and ~7% of benign epithelial and mesenchymal lung tumours.[1] The precise aetiology of the respiratory papillomas remains unclear. The proven risk factors include human papilloma virus (HPV) infection and smoking.[2] Histologically, SPPs are classified as squamous cell papilloma, glandular papilloma and mixed squamous cell and glandular papilloma (MSCGP).[3] Amongst the three histologic subtypes of SPP, mixed papillomas are the rarest and constitute 15.8% of the cases.[4] Here, we report a case of MSGCP in a 55-year-old Indian woman who presented with a left main bronchus obstruction and was managed by bronchoscopic resection.

CASE PRESENTATION

A 55-year-old woman presented to the out-patient department with dyspnoea which gradually progressed from mMRC Grade 1 to mMRC Grade 3 over 1 month. She also had dry cough and low-grade fever for 5 days. She had no addictions and was on regular medication for hypothyroidism. On examination, breath sounds were diminished in left infra clavicular, mammary, supra scapular and upper inter scapular areas. A chest radiograph and computed tomography (CT) scan of the chest showed left upper lobe collapse. Diagnostic bronchoscopy performed under conscious sedation to ascertain the cause of collapse revealed an exophytic mass with an irregular polypoidal surface protruding from the left upper lobe bronchus and extending into the left main bronchus causing ~90% luminal occlusion (Figure 1A).

Endobronchial biopsy of the mass showed fibro-vascular papillary cores lined predominantly by glandular epithelia with foci of transitions into non-keratinising squamous epithelia. The glandular epithelium was composed of ciliated and non-ciliated pseudostratified columnar cells and a few mucous columnar cells. No nuclear atypia, stromal or vascular invasion was noted (Figure 2A, 2B, 2C). Immuno-histochemical analysis revealed squamous cells that were positive for p63 and cytokeratin 5/6 while the glandular epithelium was positive for CK7 (Figure 2D, 2E). A diagnosis of solitary mixed squamous cell and glandular papilloma was made.

Patient then underwent a whole-body positron emission tomography- computed tomography (PET-CT scan) which did not reveal any other focus of disease. The available treatment options were discussed with patient who then opted for endobronchial management of the benign tumour. The procedure was performed under general anaesthesia. Rigid bronchoscopic intubation was done and the tumour was excised using a combination of electrocautery snare and a 1.9 mm cryoprobe (Figure 1B). The base of tumour appeared to arise from the left secondary carina which was cauterised using a blunt tipped electrocautery probe to achieve haemostasis and prevent recurrence. The procedure was uneventful, and the patient was discharged on the next day. Histopathological examination confirmed the diagnosis of mixed squamous cell and glandular papilloma. On immunohistochemical analysis, both squamous and glandular epithelia were negative for p16 (Figure 2F).

Patient has been under regular follow up. Patient continues to remain symptom free 1-year post procedure. Surveillance bronchoscopy showed normal tracheo-bronchial tree with no recurrence of the tumour (Figure 1C).

DISCUSSION

Papillomas are rare benign lung tumours. They generally arise from the upper respiratory tract and are multiple in number. Solitary papillomas of the lower respiratory tract are

This article was accepted: 05 March 2023
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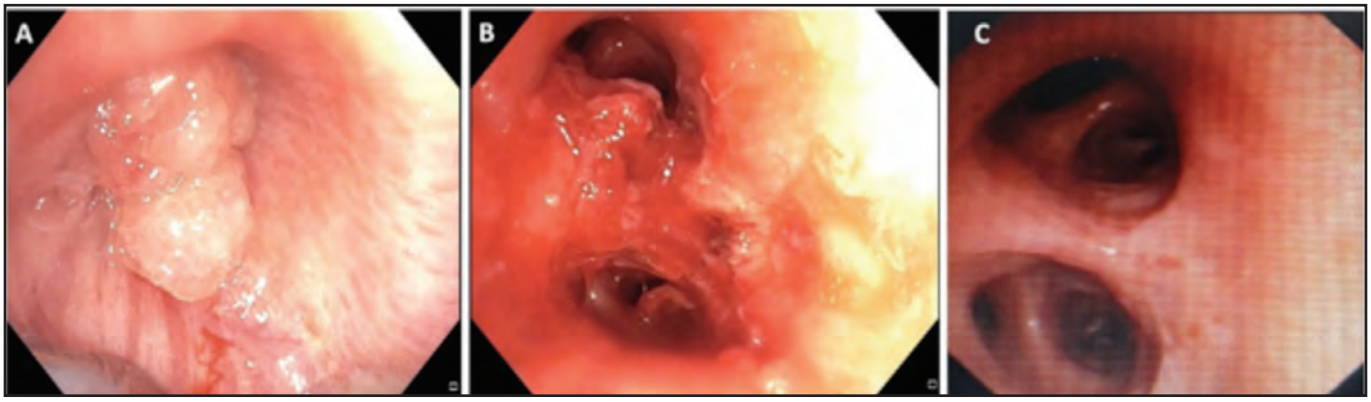

Fig. 1: A) Initial bronchoscopic image showing near complete occlusion of the left main bronchus with an exophytic mass having an irregular polypoidal surface; B) Image post endobronchial tumour removal showing patent segments of the left upper and lower lobes; C) Bronchoscopic surveillance image taken at 1-year follow up showing normal endobronchial anatomy with no residual disease

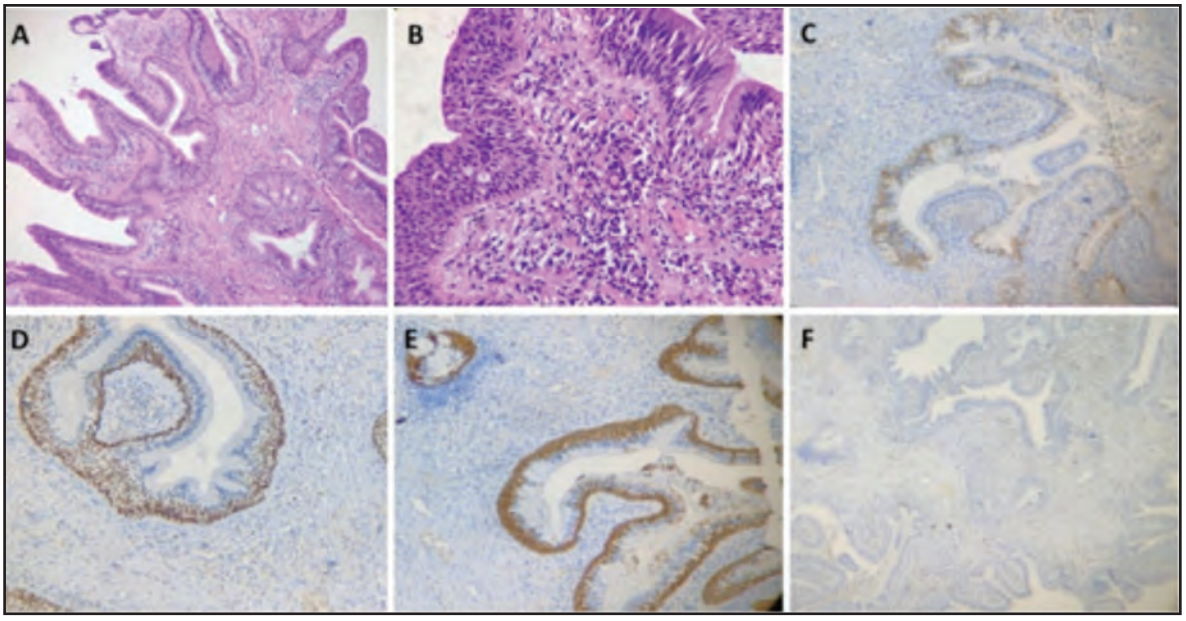

Fig. 2: A) Photomicrograph of the endobronchial biopsy showing papillary structures lined by epithelial cells without stromal invasion (haematoxylin and eosin stain, 10x); B) Tumour composed of squamous cells and ciliated columnar cells without nuclear atypia (haematoxylin and eosin stain, 40x); C) CK 7 positive columnar/glandular epithelium; D) p63 positive squamous epithelium and basal cells of glandular epithelium; E) CK 5/6 positive squamous epithelium and basal cells of glandular epithelium; F) Negative immunohistochemistry for p16

uncommon. The incidence of SPP is reported to be 3.95 cases/105 patients/yr. SSP's usually present in 3rd to 6th decade of life and affect men three times more commonly than women.[4] HPV infection, smoking and presence of an airway foreign body are the known risk factors for SPP.[2,5] Most common symptoms at presentation are cough, haemoptysis, dyspnoea, fever and wheezing. Histologically SPP are classified as squamous (65.35%), glandular (19.8%) or mixed squamous cell and glandular papillomas (15.8%). Malignant transformation is seen in squamous (10.8%) and mixed papillomas (25%).[4]

Mixed papillomas are the least common histologic type of SPP. They are generally seen from 3rd to 6th decade of life with the youngest case reported being 17 years old.[6] As compared to other papillomas, smoking history (78%) is more common in patients with MSCGP.[7] Patients with smoking history usually had a centrally located tumour.[8] MSCGP showed no predilection for any particular side of the lung and peripherally located papillomas were more common than central. Most of the previously reported cases of MSCGP are from the Korean and Japanese population.[9]

Our case is a middle-aged woman from India with a centrally located MSCGP. She had no prior history of smoking or passive cigarette smoke exposure. However, the patient had history of significant exposure to biomass fuel burning which she uses on a daily basis for household purposes. This biomass fuel exposure could have predisposed to development of the papilloma. Similar to cigarette smoke,

exposure to biomass fuel is a well-established risk factor for various respiratory diseases and malignancies in the developing world.[10] Association of airway papillomas with biomass fuel exposure is still unexplored.

There is no reported association between HPV and MSCGP.[9] Immunohistochemical analysis in our patient also showed that both squamous and glandular epithelia were negative for p16. Negative HPV status and common history of smoking in MSCGP may indicate an aetiological association with tobacco smoke. This is postulated as the most likely reason for higher malignant transformation (25%) in MSCGP as compared to other SPP. The higher risk of malignant transformation must be considered in deciding the treatment option for MSCGP. Conservative management may be justified in glandular papillomas but excision is to be preferred in squamous papillomas and MSCGP.

Results with both lung resection surgery and endoscopic removal of the lesion followed by close monitoring are encouraging. Lobectomy is the most commonly performed surgical procedure.[4,9] There are no randomised studies comparing surgery and bronchoscopic removal for management of solitary papillomas. Bronchoscopic approach can be offered to patients with purely endo-luminal lesions, and at centres with expertise in bronchoscopic removal of tumours. As the best treatment option remains unclear, it must be individualised to each patient after a through discussion with the patient regarding all the available options. Our patient wanted a less invasive procedure and hence chose to undergo bronchoscopic removal of the tumour. She has been under regular follow-up and surveillance bronchoscopy showed no recurrence after a period of 1 year.

CONCLUSION

Solitary papillomas of the lower respiratory tract are uncommon benign tumours of the tracheobronchial tree. A high index of suspicion is needed to diagnose these uncommon tumours. When they are purely endoluminal, a bronchoscopic resection of these tumours can be safely performed. Solitary papilloma is an uncommon cause of endobronchial tumour and must be considered as adifferential for benign endobronchial lesions. Biomass fuel exposure may be considered a risk factor forcentral papillomas, especially in the developing world.Selected cases of purely endobronchial tumours can bemanaged successfully with endobronchial resection.

REFERENCES

1. Popper HH, Wirnsberger G, Jüttner-Smolle FM, Pongratz MG, Sommersgutter M. The predictive value of human papilloma virus (HPV) typing in the prognosis of bronchial squamous cell papillomas. Histopathology 1992; 21(4).
2. Katial RK, Banlett R, Whitlock WL. Human papilloma virus associated with solitary squamous papilloma complicated by bronchiectasis and bronchial stenosis. Chest 1994;1 06(6).
3. Flieder DB, Koss MN, Nicholson A, Sesterhenn IA, Petras RE, Travis WD. Solitary pulmonary papillomas in adults: A clinicopathologic and in situ hybridization study of 14 cases combined with 27 cases in the literature. Am J Surg Pathol 1998; 22(11).
4. Tryfon S, Dramba V, Zoglopitis F, Iakovidis D, Sakkas L, Kontakiotis T, et al. Solitary papillomas of the lower airways: Epidemiological, clinical, and therapeutic data during a 22-year period and review of the literature. J Thorac Oncol 2012; 7(4).
5. Greene JG, Tassin L, Saberi A. Endobronchial epithelial papilloma associated with a foreign body. Chest 1990; 97(1).
6. Saraya T, Fujiwara M, Kimura H, Takei H, Takizawa H. A 17-year-old woman with a solitary, mixed squamous cell and glandular papilloma of the bronchus. Respirol Case Reports 2019; 7(2).
7. Inamura K, Kumasaka T, Furuta R, Shimada K, Hiyama N, Furuhata Y, et al. Mixed squamous cell and glandular papilloma of the lung: A case study and literature review. Pathol Int 2011; 61(4).
8. Ishida H, Sakaguchi H, Nitanda H, Yamazaki N, Shimizu Y, Kaneko K. Three cases of mixed squamous cell and glandular papilloma of the peripheral lung. Japanese J Lung Cancer 2010; 50(3).
9. Iijima Y, Nakajima Y, Kinoshita H, Akiyama H, Nishimura Y, Hirata T. Mixed squamous cell and glandular papilloma of the lung—A case report and literature review in Japan. Int J Surg Case Rep 2020; 68.
10. Prasad R, Singh A, Garg R, Hosmane GB. Biomass fuel exposure and respiratory diseases in India. Biosci Trends 2012; 6(5).