Endobronchial deposits of chronic lymphocytic leukemia – an unusual cause of central airway obstruction

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Abstract
A 66-year-old woman with a background of chronic lymphocytic leukemia (CLL) was admitted to the hospital on several occasions with recurrent episodes of community-acquired pneumonia. Computed tomography and bronchoscopy revealed multiple obstructing endobronchial polyps. Post-obstructive pneumonia together with immunoglobulin G deficiency was considered the most likely cause of these recurrent infections. Bronchoscopy was performed for removal of the critically obstructing lesions. Histopathology revealed replacement of bronchial mucosa with CLL deposits. Despite a brief window of infection-free survival following therapy, she remained susceptible to pneumonia with further hospital admissions and eventually died from her disease.

Introduction
Respiratory complications are common in patients with chronic lymphocytic leukemia (CLL) and can result in significant morbidity and mortality [1]. Although pulmonary involvement can be seen in up to 40% of autopsy cases in patients with CLL, only a small percentage manifest clinical or radiologic evidence of pulmonary involvement in life [2]. Pneumonia is the most common pulmonary complication followed by malignant pleural effusion and upper respiratory tract infection [1]. Other pulmonary complications include extrinsic central airway obstruction from hilar and mediastinal lymphadenopathy, pulmonary leukostasis and leukemic infiltrates [1]. To our knowledge, endobronchial polyps of CLL tumor have not previously been reported.

Case Report
A 66-year-old woman of Middle-Eastern background presented with fevers, productive cough, and coryzal symp-
referred for therapeutic endobronchial resection of the
tumor deposits to reduce the risk of recurrent infection and
airway collapse.

At bronchoscopy, multiple endobronchial polyps were
present. A lesion on the postero-lateral wall of the proximal
left main bronchus was causing noncritical obstruction. A
second lesion, also non-obstructive, was noted in the left
upper lobe. On the right, a polyp was present in the apical
segment of the right upper lobe. A larger lesion was present
in the distal bronchus intermedius (BI) along the posterior
wall causing 60–70% obstruction of the right lower lobe
lumen (Fig. 1B). This was resected using a snare diathermy
and another lesion, arising from the RB6 segment, was
noted and similarly resected. Six freeze–thaw cycles of cryo-
therapy were then applied to the base of the BI lesion. The
patient tolerated the procedure well and was discharged
home 2 days post bronchoscopy.

Histopathology revealed diffuse infiltration of small lym-
phocytes in the polyps consistent with CLL involvement
(Fig. 2).

The patient was free of cough and infection for 2
months, but then developed two episodes of post-
obstructive lingula pneumonia. She underwent a second
bronchoscopy 4 months after the first and a polyp causing
complete occlusion of the lingula was snared and debulked.
The tumour in the right BI had regrown now causing 50%
narrowing of the airway – this was treated with freezing
cycles of cryotherapy. Given her declining health, no further
endobronchial interventions were undertaken. The patient
was discharged on home oxygen under the care of the pal-
liative team for end of life care and died 2 months after the
second bronchoscopy.

Discussion

CLL accounts for approximately 30% of all leukemias and
is the commonest form of leukemia among older popula-
tions in developed countries [3]. CLL is a malignancy of
mature B cells with typically the co-expression of the CD5,
CD20, and CD23 antigens [4]. Although the etiology of
CLL is unknown, recognized risk factors include male sex,
advanced age, white race, and a family history of CLL [3].

Available treatments generally induce remission, although
nearly all patients relapse, and CLL remains an incurable
disease [4].

Combination chemoimmunotherapy with fludarabine,
cyclophosphamide, and rituximab is considered first line in
the treatment of CLL, with overall response rates of 95%,
and complete remission rates of 44% [5]. However, this
treatment is too toxic for many elderly patients, who consti-
tute most of the individuals with this disease, and there
remain subgroups of patients for whom this therapy has
minimal effect [5].

CLL can have several pulmonary manifestations that are
often difficult to distinguish from other pulmonary disor-
ders on clinical grounds alone [2]. Common radiographic
findings include pulmonary infiltrates, pleural effusion,
and hilar and mediastinal lymphadenopathy [2]. The most common cause of infiltrates seen in patients with CLL was found to be secondary to infections [2]. Berkman et al. described three cases of pulmonary infiltration with CLL with clinical and radiological evidence of pulmonary disease due to leukaemic infiltration [2]. The diagnosis of pulmonary CLL in all three patients was established through transbronchial biopsy, and, in two cases, bronchoalveolar lavage [2]. These patients were commenced on chemotherapy and steroid therapy with varying responses to the antileukaemic treatment [2]. A single case report by Chernoff et al. in 1984 detailed the course of a patient with endobronchial CLL causing narrowing and edema of the left upper and lower lobe bronchi resulting in recurrent post-obstructive pneumonia [6]. However, the narrowing was diffuse and not associated with focal polypoid deposits of CLL as in our case.

Airway obstruction does not always require intervention, but in a well-selected population airway interventions could be considered to offer therapeutic benefit when other modalities of treatment are limited [6]. Interventional procedures can offer immediate symptom relief and improved quality of life with minimal risks and peri-procedural complications [7]. Several techniques are available to manage central airway obstruction and include airway dilatation, ablation, and tracheobronchial stenting [7]. The risk–benefit profile of such interventions need to be weighed carefully as in our patient for whom a palliative intent procedure was deemed important to improve quality of life, albeit briefly.

Disclosure Statements
No conflict of interest declared.
Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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