Bronchial glomus tumor mimicking a COPD exacerbation

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We report the case of a glomus tumor originating in the left main bronchus diagnosed in a 79 year old Caucasian man. A glomus tumor is an extremely rare neoplasm in the bronchi with nonspecific clinical features. Bronchoscopy allows the diagnosis through biopsy and subsequent histopathological examination of the tissue and in selected cases may represent a valid alternative to surgery permitting a radical tumor excision. Monaldi Arch Chest Dis 2011; 75: 3, 194-198.

Keywords: Glomus tumor, Central airway tumors.

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Case report

A 79 year old Caucasian man (ex smoker, 35 p-y) was referred to our hospital due to the presence in the last 2.5 months of cough and bloody sputum, suggestive, according to his general practitioner, of an exacerbation of chronic obstructive pulmonary disease. His past medical history was unremarkable except for the presence of systemic arterial hypertension and an episode of superficial venous thrombosis 8 years before. Physical examination, routine laboratory tests, chest radiography and cytopathological examination of the sputum were normal. Arterial blood gases analysis, with the patient breathing room air, demonstrated a severe hypoxemia (PaO₂ 60 mmHg, PaCO₂ 45 mmHg, pH 7.38, HCO₃⁻ 27 mmol/l). Spirometric values (figure 1) were: [vital capacity 2.79 liters (83% of predicted value), forced vital capacity (FVC) 2.47 liters (76% pred), forced expiratory volume in one second (FEV₁) 1.33 liters (55% pred), FEV₁ post albuterol 1.45 liters, post-bronchodilator FEV₁/FVC ratio of 58%].

Suspecting lung cancer, we performed a diagnostic fiberoptic bronchoscopy (FBS) which revealed in the left main bronchus, a vivid red, polypoid, endoluminal mass, obstructing around 80% of the bronchial lumen (figure 2). A computed tomography scan of the chest (figure 3) confirmed the endobronchial lesion.

The pathological examination of the biopsy was consistent with a glomus tumor [polygonal cells with pale cytoplasm and round nuclei without atypia, strongly immunoreactive for smooth muscle actin and h-caldesmon, separated by little extracellular matrix and arranged around vessels] (figure 4).

Subsequently the tumor was excised via rigid bronchoscopy and Nd-YAG laser, under general anaesthesia, at the University hospital of Parma. This procedure permitted the removal of the tumor using optic forceps. No bleeding or other adverse events occurred. The patient was discharged and sent home after two days. After a mean follow up of 5 years, repeated FBS excluded the presence of recurrent tumor and showed only a slight residual stenosis of the bronchial lumen (figure 2).

Discussion

A glomus tumor is a rare neoplasm derived from the normal glomus body, a specialised structure involved in thermal regulation, typically highly vascularised, composed of three types of cells: glomocytes (modified smooth muscle cells), vessels (arteriovenous anastomosis) and smooth muscle [1, 2].
The glomus tumors mainly occur in the dermis or subcutaneous tissue, predominantly in the subungual region, and can be single or multiple. Rarely they arise from other sites [1], probably because of the presence of ectopic glomus cells.

The bronchial localization of glomus tumors is extremely rare, with only 10 cases reported in literature (summarized in table 1) [1-10].

The average age of these patients has been 43 years, much younger when compared with our case report (79 years old). Interestingly there is a large prevalence of males (male to female ratio = 9:1). All the reported cases have originated in the main bronchi with no significant predilection for the left or right bronchus. The most common symptoms are cough [2, 3, 6-10], chest pain [3, 6, 7], hemoptysis [1, 4, 10] and dyspnea [3, 5, 6].

The chest x-ray is usually normal in appearance, while the CT scan of the chest usually reveals the presence of an endoluminal mass in the affect-
Mus tumor looks like a red-brown endoluminal polypoid mass.

Microscopically, in haematoxylin and eosin-stained sections, the glomus tumor is composed of small polygonal or round cells, closely packed together, with a round, uniform, centrally located nucleus and narrow eosinophilic cytoplasm, with arborizing thin-walled blood vessels intersperse between the neoplastic cells [3]. Pleomorphism is minimal, mitotic activity is scarce or absent, without areas of necrosis.

Glomus tumors have positive immunohistochemical staining for α-smooth muscle actin, h-caldesmon, vimentin and collagen type IV.

Their differential diagnosis includes bronchial carcinoids, haemangiopericytoma and smooth muscle neoplasms.

Bronchial glomus tumors are usually benign with an indolent behaviour. Malignant glomus tumors have been reported in literature, but not in the bronchial airways.

Previously described cases of bronchial glomus tumors have been resected predominantly by surgical approach [1-5, 9], and only few, including our case, have been treated using bronchoscopy [6-8, 10; table 2].

Fig. 3. - CT of the chest, showing an intraluminal mass in the left main bronchus.

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Bronchoscopy allows the diagnosis through biopsy and subsequent histopathological examination of the tissue. Macroscopically a bronchial glomus tumor looks like a red-brown endoluminal polypoid mass.

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### Table 1. - Clinical features of the cases of bronchial glomus tumor described in the literature

<table>
<thead>
<tr>
<th>Reference</th>
<th>Age and gender of the patient</th>
<th>Symptoms</th>
<th>Localization</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lange 2000</td>
<td>20 years old male</td>
<td>dyspnea</td>
<td>proximal left bronchus</td>
<td>sleeve resection, performed through a left anterior thoracotomy</td>
</tr>
<tr>
<td>Oizumi 2001</td>
<td>48 year old male</td>
<td>bloody sputum</td>
<td>left main bronchus</td>
<td>partial wedge resection and bronchoplasty</td>
</tr>
<tr>
<td>Yilmaz 2002</td>
<td>29 year old female</td>
<td>cough, dyspnea and left-sided chest pain</td>
<td>left main bronchus</td>
<td>bronchotomy plus mass extirpation in left thoracotomy</td>
</tr>
<tr>
<td>De Weerdt 2004</td>
<td>37 year old male</td>
<td>dry cough, fever, nocturnal sweating, dyspnea, right thoracic pain and fatigue</td>
<td>bronchus intermedius</td>
<td>rigid bronchoscopy with ND-YAG laser</td>
</tr>
<tr>
<td>Vailati 2004</td>
<td>40 year old male</td>
<td>fever, productive cough and chest pain</td>
<td>right main bronchus and distally in the truncus intermedius and lower lobe bronchus</td>
<td>endoscopic with electrocoagulator using a rigid bronchoscope</td>
</tr>
<tr>
<td>Takahashi 2006</td>
<td>67 years old male</td>
<td>cough</td>
<td>right superior bronchial trunk</td>
<td>segmental resection through a standard right side thoracotomy approach</td>
</tr>
<tr>
<td>Akata 2008</td>
<td>39 year old male</td>
<td>cough</td>
<td>left main bronchus</td>
<td>endoscopic rigid bronchoscopy</td>
</tr>
<tr>
<td>Filice 2008</td>
<td>69 year old male</td>
<td>hemoptysis</td>
<td>right main bronchus</td>
<td>a posterolateral thoracotomy with a sleeve resection</td>
</tr>
<tr>
<td>Inaba 2010</td>
<td>67 year old male</td>
<td>hemoptysis, cough</td>
<td>truncus intermedius</td>
<td>bronchoscopic removal of the tumor using a high-frequency-wave snare and microwave coagulation</td>
</tr>
<tr>
<td>de Azevedo-Pereira 2010</td>
<td>32 year old male</td>
<td>fever, dry, cough</td>
<td>right main bronchus</td>
<td>right upper lobectomy and wedge bronchoplasty</td>
</tr>
</tbody>
</table>

### Table 2. - Results and modality of therapeutic bronchoscopy for bronchial glomus tumor in the published cases

<table>
<thead>
<tr>
<th>Reference</th>
<th>Modality of resection</th>
<th>Complications</th>
<th>Follow up</th>
<th>Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>De Weerdt 2004</td>
<td>cryotherapy followed by rigid bronchoscopy with Nd-YAG laser</td>
<td>recurrence after one month</td>
<td>1 month</td>
<td>yes</td>
</tr>
<tr>
<td>Vailati 2004</td>
<td>electrocoagulator using a rigid bronchoscope</td>
<td>bleeding &gt;800 ml</td>
<td>1 month</td>
<td>none</td>
</tr>
<tr>
<td>Akata 2008</td>
<td>rigid bronchoscopy</td>
<td>not described</td>
<td>6 years</td>
<td>none</td>
</tr>
<tr>
<td>Inaba 2010</td>
<td>high-frequency-wave snare and microwave coagulation during bronchoscopy</td>
<td>not described</td>
<td>1 year</td>
<td>none</td>
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</tbody>
</table>
In conclusion, we describe in this report an exceptionally rare case of bronchial glomus tumor, arising in an elderly smoker, at which prima facie was considered as being a more usual lung cancer. Moreover this case belongs to the small group of bronchial glomus tumors excised using rigid bronchoscopy.

Acknowledgements: We would sincerely thank the patient for his collaboration as well as the kind consent to the description of his case, in order to support the increase of medical knowledge on rare diseases. We also like to extend our gratitude to Benedetta Mantovani for her graphic contribution.

References