

Bronchial glomus tumor mimicking a COPD exacerbation

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ABSTRACT: *Bronchial glomus tumor mimicking a COPD exacerbation. F. Ravenna, S. Saturni, A. Casalini, F.P. Pilato, C. Pasquini, G. Caramori, A. Papi.*

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 neo-

plasm 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.

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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/FCV 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 to-

mography 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].

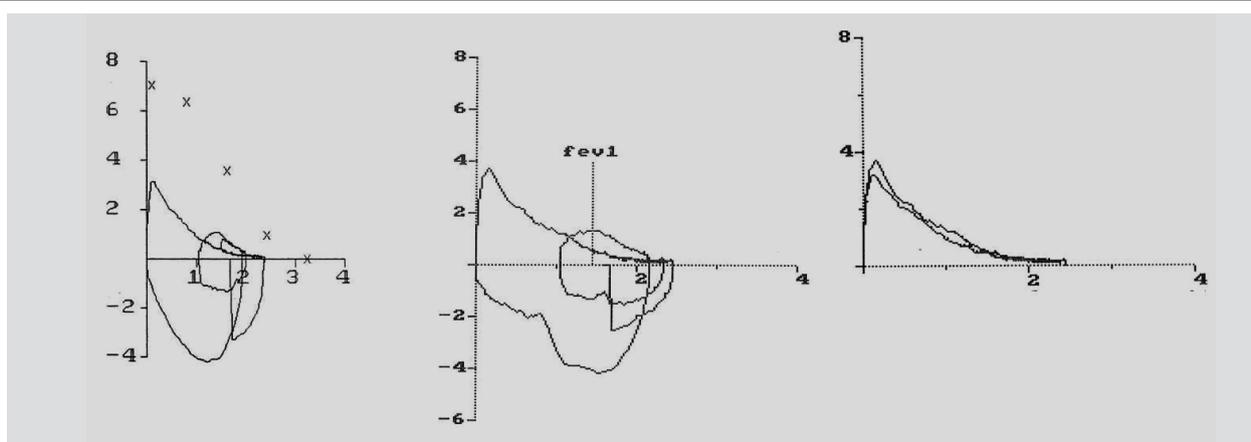


Fig. 1. - Spirometric values before and after bronchodilator indicating airflow obstruction not reversible after inhalation of albuterol.

Endoscopic features

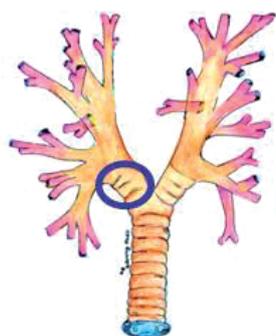


Fig. 2a

Localization in the left main bronchus

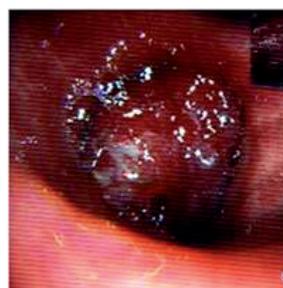


Fig. 2b

Endoscopic features before resection

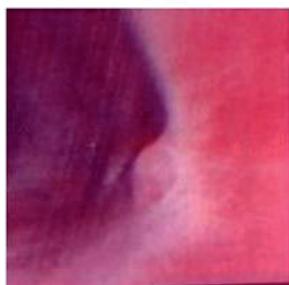


Fig. 2c

Endoscopic features immediately after resection



Fig. 2d

Endoscopic features 5 years after resection

Fig. 2. - Endoscopic features of the bronchial glomus tumor before (2b), immediately after (2c) and 4 years after (2d) its resection. The tumor localized in the left main bronchus (2a).

The glomus tumors mainly occur in the dermis or subcutaneous tissue, predominantly in the sub-ungual 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-

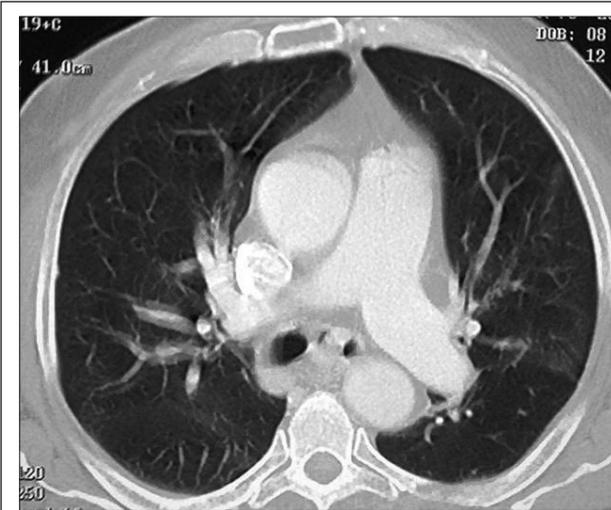


Fig. 3. - CT of the chest, showing an intraluminal mass in the left main bronchus.

ed bronchus, with a marked enhancement effect, probably due to arteriovenous anastomosis [8].

Bronchoscopy allows the diagnosis through biopsy and subsequent histopathological examination of the tissue. Macroscopically a bronchial glo-

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].

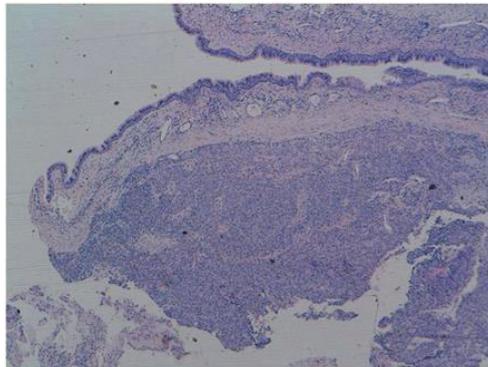


Fig. 4a
Hematoxylin-
eosin 40 x

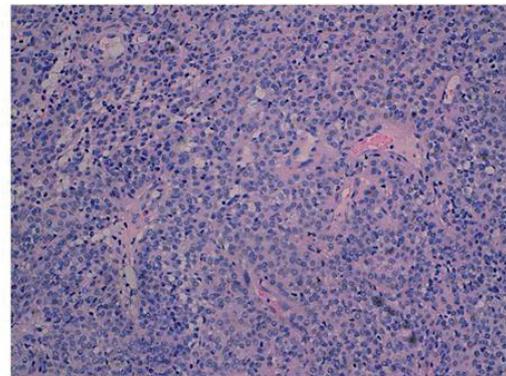


Fig. 4b
Hematoxylin-
eosin 200 x

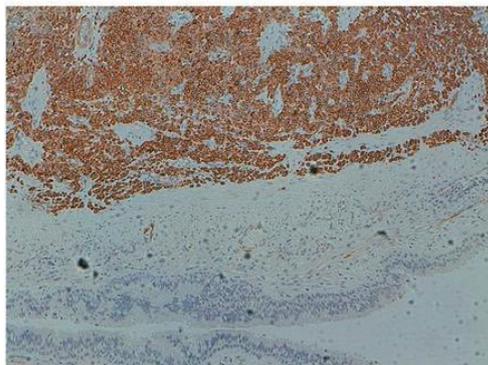


Fig. 4c
H-caldesmon
200 x

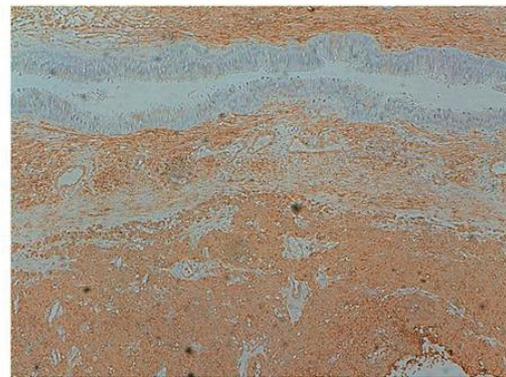


Fig. 4d
Smooth muscle actin
200 x

Fig. 4. - Histopathological appearance of the tumor. Upper panel: hematoxylin and eosin staining [at 40x(4a) and 200x (4b) magnification] showing that the neoplastic cells are infiltrating the lamina propria but not the bronchial epithelium. Lower panel: immunohistochemical staining of the neoplastic cells, respectively for h-caldesmon (4c) and smooth muscle actin (4d), appearing as brown color (both are at 200x magnification).

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

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

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

Reference	Modality of resection	Complications	Follow up	Recurrence
De Weerd 2004	cryotherapy followed by rigid bronchoscopy with Nd-YAG laser	recurrence after one month	1 month	yes
Vailati 2004	electrocoagulator using a rigid bronchoscope	bleeding >800 ml	1 month	none
Akata 2008	rigid bronchoscopy	not described	6 years	none
Inaba 2010	high-frequency-wave snare and microwave coagulation during bronchoscopy	not described	1 year	none

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.

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