Results

The cytological specimens were obtained with touch imprint in 4 cases, and with transbronchial brushing in 3 cases; 2 of these were also evaluated with a touch imprint sample, and 1 with transbronchial curettage. The histological diagnosis was PC in 7 cases and GC in 1. The NSCLC component of tumor cells in PC was adenocarcinoma in 6 cases, while in 1 case the tumor was composed of only spindle cells and giant cells.

Clinical Findings and Clinical Courses

The white blood cell counts were elevated to 9,400/μl in 1 case but were within normal range in the other 7 cases. Tumor markers were elevated in 5 cases. CEA was high in 4 cases (cases 1, 7, 8, and 9), and the CA19-9 level was also high in 1 (case 8). The CYFRA level was high in 1 case (case 4). One patient had metastasis to the brain (case 4), and another had metastasis to the right adrenal gland at the time of surgical removal of the lung tumor (case 12). Removal of the metastatic adrenal gland was performed after resection of the lung tumor. Chemoradiotherapy was performed in 2 patients after surgery. Recurrence was observed in 2 cases: 1 had a recurrent tumor in the lung (case 7) and another in the brain (case 8). Radiotherapy to the recurrent tumor in the lung was performed. The observation period from the time of the surgery was 3.5–60 months (average 29.7 months); 1 patient is dead, 2 are alive with recurrence, and 5 are alive without recurrence (table 1).

Cytological Findings

There was no difference in cytological findings depending on how the cytological specimens were obtained. However, the amount of tumor cells was small in transbronchial curettage samples, and large in transbronchial brushing samples and in touch imprint of the surgically resected tumor.

The background contained numerous lymphocytes and neutrophils with or without necrotic debris (fig. 1). There were a large number of tumor cells on the slides in some cases, but not in others. The size of the clusters seen on the slides was small, and the number of tumor cells forming the clusters was less than 20 in half of the cases. The shape of the tumor cell was spindle, or pleomorphic, and variable (fig. 2, 3). The tumor cells were large and the pleomorphism was marked. The tumor cell sizes varied by more than 5-fold in half of the cases. The pleomorphic cells varied in diameter from 40 to 80 μm, and occasionally reached up to 120 μm. The tumor cells had an abundant, thick and well-demarcated green cytoplasm that

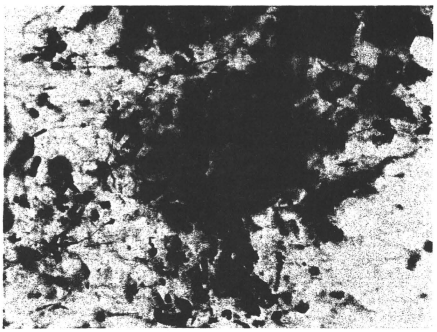

Fig. 1. Touch imprint cytology of the resected tumor from case 10. Pleomorphic spindle cells were observed in a necrotic background. Papanicolaou stain, ×40.

was green and vacuolated in some of the cells. The nuclear to cytoplasmic ratio was high. The location of the nucleus was centrifugal, and the nucleus was oval or irregularly shaped. Multinucleated giant cells were observed frequently. The nucleus was more than 5 times the size of normal lymphocytes in half of the cases and its size varied by more than 5-fold in half of the cases, ranging from 15 to 30 μm. The nuclear membrane was thin, and the nuclear chromatin was coarsely granular with an increased amount of chromatin, compared to non-tumor cells. The distribution of chromatin was uneven in most cases. The nucleolus was single, medium-sized, and round. The tumor cells were arranged in flat loose clusters (fig. 2, 3), but some were in fascicles (fig. 4). Cohesive clusters of atypical epithelial cells were also observed (fig. 5).

The components of tumor cells in pathological and cytological specimens are listed in table 2. The spindle cell component was observed in cytological specimens from 4 cases, and in pathological specimens from 7 cases. The giant cell component was observed in cytological specimens from all cases with a giant cell component in the pathological specimens. The adenocarcinoma component was observed in cytological specimens from 4 cases, and in pathological specimens from 6 cases. The large-cell carcinoma component was observed in cytological specimens obtained from all cases with a large cell carcinoma component. Summary of cytological features of sarcomatoid component of pleomorphic carcinoma and giant cell carcinoma is listed in table 3.

Fig. 2. Transbronchial brushing cytology of case 9. Pleomorphic spindle cells were arranged in loose clusters. Papanicolaou stain, ×40.

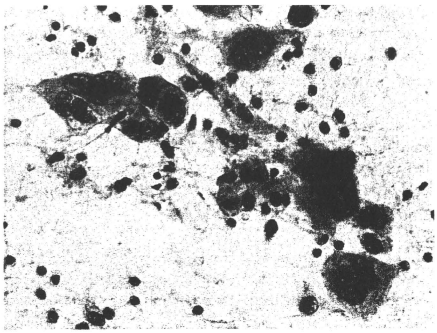

Fig. 3. Multinucleated cells were arranged in loose clusters in a background of lymphocytes (case 1). Papanicolaou stain, ×40.

Fig. 4. Transbronchial brushing cytology of case 9. Pleomorphic spindle cells were arranged in fascicles. Papanicolaou stain, ×40.

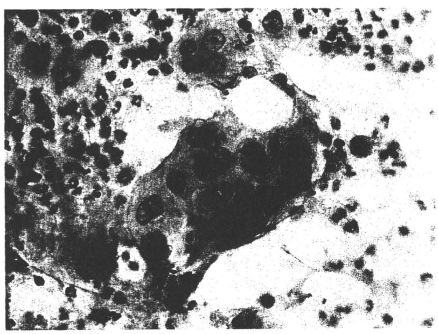

Fig. 5. Cohesive clusters of atypical epithelial cells were observed in a background of neutrophils (case 2). Papanicolaou stain, ×40.

Discussion

Hummel et al. reported that cytological findings of PC include a conspicuous population of pleomorphic spindle cells arranged singly, in loose clusters, and in fascicles, and as microtissue fragments in a necrotic background [8]. Myxoid stromal fragments are also present. In addition, cohesive clusters of typical epithelial cells have been noted. There have been reports that pre-operative transbronchial brushing cytology of the PC revealed adenocarcinoma or atypical cells [10, 11]. Cytological study of the tumor in cases 1, 2, and 4 in our study revealed adenocarcinoma and giant cells, but not spindle cells, although spindle cells were components of the tumor. The results of our study and others suggest that spindle cells have poor adhesiveness to each other, and that they detach eas-

Table 2. Components of tumor cells observed in pathological and cytological specimens

Case	Methods	Component of tumor cells in pathological specimens				Component of tumor cells in cytological specimens			
		spindle cells	giant cells	AD	LA	spindle cells	giant cells	AD	LA
1	TI	present	present	present	present	X	present	present	present
2	TI	present	present	present	present	X	present	present	present
4	Cr	present		present		X		present	
7	TI	present	present	present		present	present	X	
8	TI	present		present		present		present	
9	Br	present	present			present	present		
10	Br	present	present	present		present	present	X	
12	Br		present				present		

AD = Adenocarcinoma; Br = brushing; Cr = curettage; LA = large-cell carcinoma; TI = touch imprint; X = absent.

Table 3. Summary of cytological features of sarcomatoid component of pleomorphic carcinoma and giant cell carcinoma

Background	necrosis	present	2/8 (25%)
	type of cells	lymphocytes, neutrophils	7/8 (88%)
Amount of tumor cells		large	5/8 (63%)
Clusters	size	small	4/8 (50%)
	nuclear overlapping	not obvious	8/8 (100%)
	arrangement	2-dimensional	6/8 (75%)
Cells	shape	spindle, pleomorphic, variable	8/8 (100%)
	size	large	7/8 (88%)
	variability in size	5 times or more	4/8 (50%)
	pleomorphism	marked	7/8 (88%)
	margin	demarcated	5/8 (63%)
	cell adhesion	poor	7/8 (88%)
Cytoplasm	color	green/blue	8/8 (100%)
	nature	translucent or vacuole, thick	8/8 (100%)
Nucleocytoplasmic ratio		increased	7/8 (88%)
Nucleus	location	centrifugal	5/8 (63%)
	shape	irregular, oval	8/8 (100%)
	size	5 times of lymphocyte or more	4/8 (50%)
	variability in size	5 times or more	4/8 (50%)
	nuclear membrane	thin, slightly thick	8/8 (100%)
	hyperchromatism	present	8/8 (100%)
	chromatin texture	coarsely granular	7/8 (88%)
	distribution of chromatin	uneven	5/8 (63%)
Nucleolus	shape	round	7/8 (88%)
	size	medium	4/8 (50%)
	number	single	7/8 (88%)

ily from the glass slide during the staining process. On the other hand, the adenocarcinoma component was not observed in cytological specimens from cases 7 and 10. Pathological specimens from case 7 revealed that the adenocarcinoma component was a solid adenocarcinoma with mucin that had bizarre nuclei. Giant cells and spindle cells were marked in this case, and mucin in the cytoplasm was difficult to discern in cytological specimens. Pathological specimens in case 10 revealed that the adenocarcioma component comprised a small percentage of the tumor. This may be the reason why the adenocarcinoma component did not appear in cytological specimens from case 10.

There have been only a few cytological studies of GC [12, 13]. GC cytology specimens have exhibited numerous mono- or multinucleate giant cells with significant pleomorphism in size and shape. The cytoplasm of the giant cells is abundant, eosinophilic, microvesicular, and well demarcated. Most of the tumor cells have round, oval or irregularly shaped macronuclei with coarse, granular chromatin and large, prominent nucleoli. Their cytoplasm is occasionally infiltrated with neutrophils. The tumor cells usually occurred singly, and the background contains tumor diathesis with numerous polymorphonuclear leukocytes [12, 13].

Giant cells are one component of PC or GC [1]. However, there is no clear definition of how large these giant cells are. Fishback et al. reported that the single large pleomorphic nucleus of GC measured greater than the diameter of four small resting lymphocytes [14]. Guillan and Zelman reported that the giant cells varied in size from 50 to 120 μm in diameter [15], and Hellstrom and Fisher reported that the giant cells measured from 80 to 100 μm [16]. This vague definition of giant cells causes confusion among pathologists. In our study, the mononucleated giant tumor cells had large nuclei, the size of which was greater than the diameter of 5 resting lymphocytes in half of the cases. There was variability in the size of the nuclei, and the size of the largest nucleus was 5 times greater than that of the smallest nucleus of the tumor cells in half of the cases.

It has been reported that the prognosis for PC patients is worse than that for patients with other NSCLC in surgically resected cases [2–4]. In contrast, Nakajima et al. reported similar clinical behaviors and prognosis between PC and other NSCLC [7]. Pelosi et al. reported that stage I PC behaves more aggressively than ordinary NSCLC; however, the differences were not statistically significant for both overall and disease-free survival curves [6]. Yamamoto et al. reported that the overall 5-year survival rate of surgically resected PC was 80.0% and the disease-free survival rate was 63.3%, which were both far better than rates reported elsewhere [5].

PCs have been reported to be highly metastatic. In our study, some patients had a recurrence even though the tumor was stage I or II; the patient with a stage IA tumor had a recurrence in the lung 31 months after surgery (case 7), and 1 patient with a stage IIB tumor had a brain metastasis 21 months after the surgery (case 8). In contrast, some patients had a favorable prognosis. One patient with a stage IIB tumor is alive 5 years after surgery without any adjuvant therapy (case 9). One patient with a stage IIIA tumor underwent thoracic radiotherapy and chemotherapy (CDDP + GEM) and is alive without recurrence 40 months after the surgery (case 10). One patient (case 12) had an enlarged right adrenal gland the size of which was 15 mm, and its size had become 53 mm six months later. It was surgically removed and confirmed to be metastasis from a pulmonary PC. The patient is alive 23 months after the surgery of the lung tumor.

The contradictory prognoses of PC in different studies may be due to the different criteria of PC used among pathologists. Because ours is a multidisciplinary study, we selected cases that underwent pathological review by pathologists specialized for lung cancers. We did not include patients treated with chemotherapy or radiotherapy before the surgery, because these therapies may modify the tumor cells and enlarge them even further. The present study, by analyzing carefully selected PC or GC cases, suggests that some patients with PC or GC can expect long survival after resection of the tumor with adjuvant therapy. We could not address the pathological or molecular differences between long-survivors and short-survivors suffering from PC or GC. Further studies are needed to clarify the mechanisms of different biological behaviors among this type of lung carcinoma.

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気管支鏡下に高周波スネアにて切除した気管支軟骨脂肪腫の１例

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CASE REPORT

気管支鏡下に高周波スネアにて切除した気管支軟骨脂肪腫の1例

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前門戸任[2]；佐藤雅美[1]

要約 —— **背景.** 良性腫瘍の一つである脂肪腫は，稀に軟骨成分の結節を含むことがあり，その場合，軟骨脂肪腫と呼ばれる．検索し得た範囲では，これまでに気管支に発生した軟骨脂肪腫の報告例はない．**症例.** 気管支喘息の治療歴がある70歳喫煙男性．咳嗽と喀痰，喘鳴を主訴に来院．胸部X線写真およびCT上，左主気管支内に腫瘤影を認めた．気管支鏡検査では，左主気管支内に呼吸性に移動するポリープ状の腫瘍を認めた．高周波スネアにて腫瘍茎部を切断し，腫瘍を摘出した．腫瘍摘出後，直ちに喘鳴は消失した．腫瘍は軟骨脂肪腫と診断された．術後約1年経過時点で，再発を認めていない．**結論.** 非常に稀な気管支軟骨脂肪腫を経験した．気管支鏡下に高周波スネアを用いて気管支腫瘍を切除することは，迅速かつ低侵襲な治療と十分な組織診を可能にするため，第一に考慮すべき方法である．

（気管支学．2010;32:508-511）

索引用語 —— 気管支腫瘍，軟骨脂肪腫，高周波スネア

はじめに

肺の良性腫瘍は，全肺腫瘍の2% 以下であり，気管支鏡の可視範囲内に良性腫瘍が発生する頻度はさらに少ない[1]．気管支に発生する良性腫瘍には，過誤腫，脂肪腫，軟骨腫，平滑筋腫，神経鞘腫，線維腫，乳頭腫などがある．その一つである脂肪腫は，ごく稀に軟骨細胞からなる結節を含むことがあり，その場合，軟骨脂肪腫と呼ばれる．気管支に発生した脂肪腫はMuraokaらが本邦の64例を総括しているが[2]，軟骨脂肪腫は，乳腺，皮膚・軟部組織，小腸壁，骨盤腔に数例の報告を認めるのみで[2-6]，気管支に発生した報告はない．

今回われわれは，左主気管支に発生した軟骨脂肪腫の1例を経験した．自験例をもとに，軟骨脂肪腫の病理，気管支良性腫瘍の診断および治療法について報告する．

症　例

症例：70歳男性．

主訴：咳嗽，喀痰，喘鳴．

既往歴：24歳虫垂切除術，50歳大腸ポリープ内視鏡的切除，慢性心房細動．この頃から時に喘鳴があったため，近医では気管支喘息といわれていた．66歳心原性脳塞栓症．

家族歴：特記事項なし．

喫煙歴：15本/日，50年．

飲酒歴：焼酎毎晩2合．

現病歴：20年前に気管支喘息といわれ，ここ数年はβ刺激薬，吸入ステロイドなどを近医から処方されていたが，症状は改善しなかった．咳嗽，喀痰，喘鳴が増加したため某総合病院を受診し，胸部X線写真上，左主気管支内に透亮像の欠損を指摘された．胸部CTにて左主気管支を閉塞する腫瘤が確認されたため，治療目的に当院を紹介され受診した．

入院時現症：身長164 cm，体重62 kg，体温36.2℃，血圧119/84 mmHg，脈拍100/分，不整．呼気延長とともに，低音性連続音（rhonchi）を聴取した．腹部・四肢に異常所見なく，表在リンパ節も触知しなかった．

胸部X線写真（Figure 1）：肺野に異常を認めなかったが，左主気管支内に透亮像の欠損があり，腫瘤を疑った．

胸部CT（Figure 2）：左主気管支を閉塞する腫瘤を認めた．末梢肺野には無気肺はなく，わずかな炎症治癒所見を認めた．

気管支鏡所見：声帯，気管，右気管支の可視範囲に異常所見を認めなかった．左主気管支には，気管分岐部から4軟骨輪末梢に正中側から発生する有茎ポリープ状の腫瘍を認めた（Figure 3A）．腫瘍は呼吸性に移動し，呼気時には気管分岐部まで到達した（Figure 3B）．高周波ス

宮城県立がんセンター[1]呼吸器外科，[2]呼吸器内科．
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受付日：2010年3月24日，採択日：2010年6月29日．

ネアにて腫瘍茎部を焼灼切断し，バスケット鉗子で把持して摘出した．

病理所見：肉眼的には直径 15 mm 大の黄白色球形，表面平滑で弾性硬の腫瘍であり，割面は黄白色であった（Figure 4A）．組織所見では，重層扁平上皮化生を示す気管支粘膜下に，線維性結合織を伴った異型のない成熟脂肪組織とともに成熟型硝子軟骨の結節を認め（Figure 4B），軟骨脂肪腫と診断された．切除断端は陰性であった．

経過：腫瘍の摘出後，直ちに喘鳴は消失した．第 4 病日の気管支鏡検査では，左主気管支に腫瘍の遺残なく，腫瘍末梢側の可視範囲にも異常を認めなかった．約 1 年経過した現在でも再発の兆候なく，気管支喘息を疑うような喘鳴および咳嗽を認めていない．

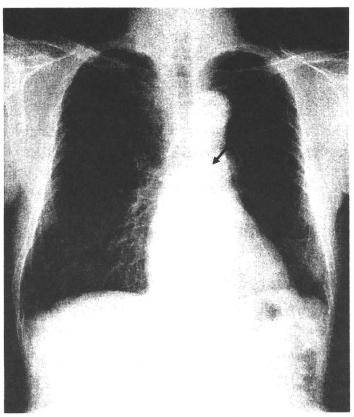

Figure 1. A chest roentgenogram indicating a loss of translucency (arrow) in the left main bronchus, with no chest abnormal shadows in either lung field.

考　察

良性肺腫瘍の一つである脂肪腫は，胸膜直下脂肪織から発生して肺実質内へ発育するものと，気管支壁の粘膜下脂肪織から発生して気管支内腔へ発育するものに分類

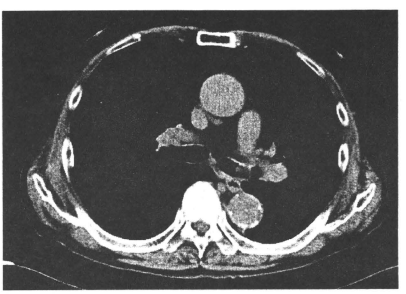

Figure 2. Computed tomography of the chest revealing a tumor in the left main bronchus.

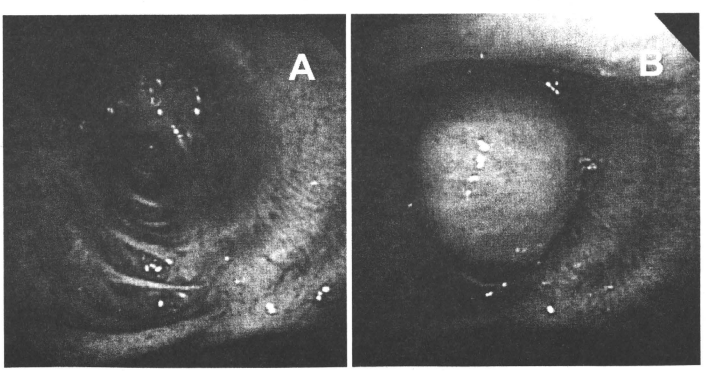

Figure 3. **A)** A polypoid tumor covered with normal bronchial mucosa originating from the medial wall of the left main bronchus. **B)** The tumor showing respiratory fluctuation, reaching the carina in expiration.

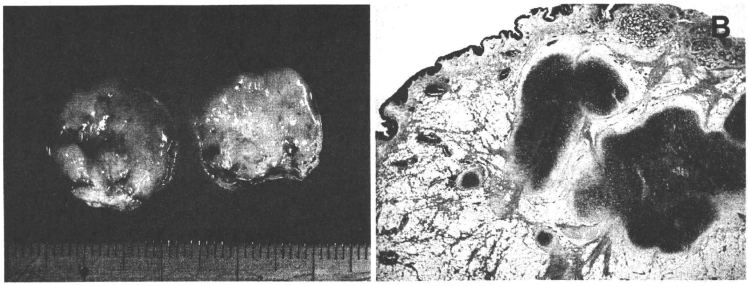

Figure 4. **A)** Macroscopic findings of the resected tumor. The tumor was covered with normal bronchial mucosa. **B)** Microscopic findings of the tumor. Islets of mature chondrocytes localizing in mature adipose tissue. Original magnification: 12.5.

される[7]．発生頻度は気管支脂肪腫の方がはるかに高いが，それでも全肺腫瘍のわずか 0.1～0.5％ を占めるに過ぎない[7]．Muraoka らが本邦 64 例の気管支脂肪腫を総括し[2]，男性 50 例，平均年齢 60 歳で右側発生例が 40 例であったと報告している．気管発生例はなかったが，気管支鏡の可視範囲内に腫瘍が存在したのは 61 例であり，気管支脂肪腫は，主気管支から亜区域気管支に好発する粘膜下腫瘍であるといえる．

一方，脂肪腫には，軟骨脂肪腫という組織学的に成熟軟骨細胞の結節を散在性に含む亜型がある．軟骨脂肪腫は，脂肪腫の中でも非常に稀であり[8]，これまでに数例の報告があるが[2,6]，気管支発生の報告は本症例が初めてである．脂肪腫の中でも，大きいものや経過の長いものが軟骨脂肪腫であったとする報告[8]や，5 年間に経験した脂肪腫 635 例中，軟骨脂肪腫は 2 例だったとする報告などがあるが[9]，正確な発生頻度は不明である．脂肪腫の組織中に軟骨の結節が形成される機序としては，脂肪組織の軟骨化生であるとする説，間葉系組織中の多能性幹細胞が軟骨へ分化したとする説[10,11]があり，興味深い．中枢気道に発生する過誤腫は，常に軟骨組織が主成分である点から[12]，軟骨脂肪腫とは鑑別される．脂肪腫および軟骨脂肪腫は，いずれも良性腫瘍であり，完全切除により治癒が望める．

気管支腫瘍に対する治療方針は，良悪性の判断のみならず，気管支壁外浸潤を伴うか否か，末梢肺組織に不可逆性の変化が及んでいるか否か，全身状態などの要素を考慮して決定する．

本症例のような，正常気道粘膜に被覆された気管支粘膜下腫瘍は，直視下の鉗子生検や擦過細胞診，針生検では確定診断が得られない，または術後診断と相違することをしばしば経験する[13]．腫瘍が有茎または結節状であれば，高周波スネアにより腫瘍を切除し，十分な組織学的検討を行える．一方，レーザー照射による焼灼では，腫瘍は蒸散して消失するため，確定診断を得るのが困難である．従って，気管支腫瘍に対する高周波スネアによる腫瘍切除は，迅速で低侵襲な治療と診断を同時に可能にすることから，第一に考慮される方法と考えられる．しかし，高周波スネアも万能ではなく，腫瘍の位置によってスネアがかかりにくい場合，または腫瘍により気管支が完全に閉塞して末梢の観察が不可能な場合には，体位を変換したり，レーザー照射と組み合わせたりする工夫が必要である．このような組織診の結果，悪性と診断された場合，内視鏡切除で遺残する場合，また CT 画像などで壁外浸潤を疑う場合や末梢肺組織に不可逆な変化が生じている場合は，開胸術による治療が必要となる．慎重に症例を選択すれば，肺実質の切除を伴わない気管支切除で完全切除が可能な場合も報告されている[14]．

結　語

これまでに報告例のない，気管支軟骨脂肪腫の 1 例を報告した．気管支腫瘍に対する高周波スネアでの気管支鏡下腫瘍切除は，迅速かつ低侵襲な治療と十分な組織診を可能にし，速やかに臨床症状を改善するため，第一に考慮すべき方法である．

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A Chondrolipoma of the Bronchus Successfully Resected by High-frequency Electric Snare

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ABSTRACT —— ***Background.*** Lipoma is a well-known benign tumor. It is known as chondrolipoma, if nodules of chondrocytes are found within the lipoma. To the best of our knowledge, there have been no reports of chondrolipoma of the bronchus in the literature. ***Case.*** A 70-year-old smoking man with a history of treatment for bronchial asthma was admitted to our hospital for cough, sputum and wheezing. Chest roentogenography and computed tomography demonstrated a tumor in his left main bronchus. Bronchofiberscopic examination revealed a polypoid tumor on the left bronchial wall, which showed fluctuation in respiratory parameters. The tumor was resected by electrosurgery with an electric snare. After resection of the tumor, the patient's wheezing ceased. Chondrolipoma was diagnosed by pathological review. At the time of writing, no signs of recurrence have seen for a year since surgery. ***Conclusion.*** We presented a case of chondrolipoma of the bronchus. Bronchoscopic resection of a bronchial tumor with an electric snare should be an initial approach of choice, because it is a quick and minimally invasive treatment, and enables thorough pathological evaluation.

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KEY WORDS —— Bronchial tumor, Chondrolipoma, High-frequency electric snare

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