Review

Clinical and Paraclinical Characteristics of Endobronchic Pulmonary Squamous Carcinoma-Brief Review

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Abstract: Background – Endobronchial squamous cell carcinoma is one of the most common types of tumors with such a location. Patients often present in advanced stages of the disease, which leads to a targeted therapeutic attitude of pneumonectomy, most of the time. Practicing a lung parenchyma-preserving surgery led us to do this review. **Material and Methods** - We used three search platforms SCIENCE, MEDLINE and PubMed, in order to identify studies presenting case reports, studies and reviews on endobronchial squamous cell carcinoma. We identified clinical and paraclinical features of endobronchial squamous cell carcinoma. All selected articles were in English and contained clinical criteria of endobronchial squamous cell carcinoma, autofluorescence bronchoscopy in endobronchial squamous cell carcinoma, imaging features of endobronchial squamous cell carcinoma, blood tumor markers specific for lung squamous cell carcinoma, histopathological features of endobronchial squamous cell carcinoma. **Results** - 73 articles were analyzed, from which 47 articles were selected as bibliographic references. We have presented the criteria found for endobronchial squamous cell carcinoma in order to highlight the main characteristics and high reliability technologies for the detection of this type of cancer. **Conclusions** – The current literature review highlights the clinical and paraclinical characteristics of endobronchial squamous cell carcinoma. It aims to open new horizons for research and early detection, frequent practice of lung parenchymal preservation surgery.

Keywords: endobronchial squamous cell carcinoma; autofluorescence bronchoscopy

1. Introduction

Endobronchial squamous carcinoma is a relatively rare entity within bronchopulmonary cancer [1,2], being one of the most common neoplasms located centrally, in the tracheal and bronchial lumen (primitive bronchi and lobar bronchi), causing partial obstruction or their total [1, 3]. Clinically, it frequently manifests with hemoptysis [4], being known as a bleeding neoplasm. Other known associated symptoms are: cough, recurrent pneumonia, wheezing and chest pain [3,4], among smokers [5]. Examination of serological tumor markers frequently found in squamous cell carcinoma, often they are: SCC-Ag (squamous cell carcinoma-associated antigen), Cyfra 21-1 (cytokeratin 19 fragment 21-1 antigen), CEA (carcinoembryonic antigen), TrxR (Thioredoxin reductase) [6, 7,8]. Computed tomographic examination has no characteristic signs for squamous cell carcinoma. There are common characteristic signs for endobronchial tumors - the cutoff sign [5], the intratumoral air bronchogram, and the use of the Tsuboi classification to specify the type of intraluminal obstruction [9]. Bronchoscopic examination highlights changes in the mucosa, with several degrees of evolution - low-grade dysplasia (mild and moderate), high-grade (severe and in situ carcinoma) and invasive carcinoma [10]. Bronchoscopy also specifies the aspects of endobronchial tumors, nodular, polypoid

lesions, with a large implantation base, bleeding, the segment of the bronchus where it is located, the degree of narrowing of the lumen [11]. Through bronchoscopy, biological samples of tumor tissue are taken for specifying the anatomopathological and immunohistochemical profile [3], including tests for the determination of immune cells, including the determination of PDL-1 [12]. From an anatomopathological-macroscopic point of view - squamous cell carcinoma represents about 20% of bronchopulmonary tumors and is most frequently centrally located [13].

Microscopically, squamous cell carcinoma has several characteristics: characteristic keratinization and intercellular bridges and shows a solidly involved growth pattern with hyperchromatic nuclei; tumor cells lack glandular structure or mucin production [13]. From an anatomopathological-macroscopic point of view - squamous cell carcinoma represents about 20% of bronchopulmonary tumors and it is most frequently centrally located [13].

This retrospective study aims to point out the clinical and paraclinical signs of squamous cell carcinoma for early diagnosis and initiation of personalized therapy with the goal of sparing lung parenchyma and increasing life expectancy among patients.

2. Material and Methods

We reviewed the Guidelines on Reviews and Meta-Analyses (PRISMA) to provide accuracy reports [14]. We used the recommendations from the preferred reporting elements systematically for the selection process.

2.1. Search Strategy

We used three online databases, SCIENCE, MEDLINE, and PubMed, since 1990 to identify studies presenting case reports, studies, and reviews of endobronchial squamous cell carcinoma. We analyzed clinical and paraclinical features of endobronchial squamous cell carcinoma. We used the following search terms in English: clinical criteria of endobronchial squamous cell carcinoma, autofluorescence bronchoscopy in endobronchial squamous cell carcinoma, imaging characteristics of endobronchial squamous cell carcinoma, blood tumor markers specific for lung squamous cell carcinoma, anatomopathological characteristics of endobronchial squamous cell carcinoma. I have identified few relevant specialized articles from which I have extracted important information. Information was synthesized according to the inclusion and exclusion criteria outlined below.

2.2. Selection Criteria

The authors independently analyzed the title, abstract and full text of the selected articles for each type of feature. Their eligibility for inclusion in this systematic review was assessed. The authors established the inclusion and exclusion criteria of the studies found to be eligible. Only articles considered eligible were studied; reading and information extraction was performed in accordance with the main aim and objective of this study.

2.3. Inclusion and Exclusion Criteria

As we aimed to analyze clinical and paraclinical characteristics of patients with squamous endobronchial lung carcinoma, only studies fulfilling the following criteria were included:

(a) the study included only patients with endobronchial squamous cell carcinoma;

(b) original reports of research studies describing the tomographic images, laboratory and/or clinical findings of this category of patients;

(c) studies published in a journal and in English;

(d) the study included features of autofluorescence bronchoscopy;

(e) studies published after 2005, up to now;

(f) studies reporting autofluorescence bronchoscopy, case reports, retrospective studies on pathologic anatomy, clinical, CT;

(g) studies that included laboratory analyzes of tumor markers in squamous cell carcinoma;

We excluded the following studies:

(a) studies that did not report original data or clear diagnostic criteria;
(b) editorials, comments, opinions;
(c) letters and conference abstracts;

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(d) Scientific papers that described operative techniques for squamous bronchopulmonary cancer

2.4. Data Extraction

The authors independently screened the titles and abstracts of the identified articles. Articles were divided into the following categories: clinical characteristics, tumor markers, characteristics of autofluorescence bronchoscopy, imaging characteristics of CT scan. Articles were reviewed to determine inclusion criteria. The operative indication elements for lung parenchymal sparing surgery and the opportunity for resection with bronchoanastomosis were analyzed.

3. Results

73 articles were analyzed, from which 48 articles were selected. These were obtained through SCIENCEDIRECT, MEDLINE and PubMed electronic searches. They were distributed as follows: clinic - 6 citations, case reports - 11, autofluorescence bronchoscopy - 13, computed tomography - 15, biomarkers - 14, pathological anatomy - 4. Table 1 summarizes the most representative sensitivity and specificity articles we reviewed. Of the 48 cited articles, only 19 have presented diagnostic yield, specificity and sensitivity. 8 retrospective studies, 4 observational studies, 3 descriptive, 2 prospective, one meta-analysis and one review were representative.

Table 1. Representative articles from the literature specifying the main author and the types of examination researched.

NR	REF	AUTHOR	NR PATIENTS	STUDY TYPE	DIAGNOSTIC YELD	SENSITIVITY	SPECIFICITY	CT	BRONHOSCOPY/ AFB	BRONHOSCOPY/NBI	Clinic	TUMOR MERKER
1	3	Saibin Wang	531	retr osp	95%	95%	95%	0	95%	0	CLINIC	unspec
2	5	Xiaochuan Zhang	366	retr osp	91,40%	9, 14%	92,4%	CT	unspec	0	CLINIC	unspec
3	7	Wei Zhao	135	retr osp	91,30%	0	0	0	unspec	0	0	MARKER
4	8	Suofu Ye	1922	retr osp	90,20%	82,50%	81,30%	0	unspec	0	0	MARKER
5	9	Tatsuya Imabayashi	1021	retr osp	75,9 - 95%	95%	95%	CT	AFB	0	0	unspec
6	10	Camelia Bădescu	156	pros p	84%	84%	84%	0	AFB	0	0	unspec

7	11	Zheng Liu	708	retrosp	89,30%	95,70%	89,30%	0	AFB	0	0	unspec
8	12	Urska Janzic	54	observ	72%	0	0	0	0	0	0	MARKER
9	18	Linjie Liu	2097	observ	65,93%	81,63%	65,93%	0	0	0	0	MARKER
10	19	Zhong-qing Chen	693	observ	65,93%	0	0	0	0	0	0	MARKER
11	20	Rafael Molina	3,144	observ	0	88,50%	82,00%	0	0	0	0	MARKER
12	27	Viorel Biciuș că	38	descrip	0	0	0	0	AFB	0	CLINIC	0
13	33	Yoonah Song	5	retrosp	0	0	0	CT	AFB	0	0	0
14	35	Semra Bilaçeroğlu	92	prosp	68%	68%	68%	CT	AFB	0	0	0
15	38	Jiayuan Sun	232	meta-anal	95%	95%	95%	0	95%	95%	0	0
16	40	Xiaoxuan Zheng	218	retrosp	92,10%	92,10%	87,30%	0	AFB	0	0	0
17	42	Bojan Zaric	65	descrip	0	0	0	0	0	mucosal wich tortuous blood vessels were identified in 72 %	0	0

										mucosal wich abnormal vascular patterns include increased vessel growth, tortuous vessels, dotted vessel, and spiral or screw-type		
18	44	Ankit Gupta	0	review	95%	95%	95%	0	95%	vessels	0	0
19	47	Hongling Wang	38	descri	93,4%	93,4%	93,4%	0	AFB	0	0	0

3.1. Study Characteristics

Clinical findings – The symptomatology described in the literature is specified for endobronchial tumors [2]. Clinical presentation of patients with endobronchial squamous cell carcinoma revealed cough, chest pain, shortness of breath, blood in sputum, wheezing, hoarseness, recurrent chest infections (including bronchitis and pneumonia), weight loss and loss of appetite, and fatigue [4], cough, dyspnoea, atelectasis, post-obstructive pneumonia, wheezing, and hemoptysis [15, 16]. Omar Elsaca & all specified of squamous cell carcinomas (SCCs) are the most common type of central tumor and can cause cough, dyspnea, atelectasis, postobstructive pneumonia, wheezing, and hemoptysis [15].

Laboratory findings – In patients with squamous cell carcinoma, hypercalcemia is frequently encountered [15, 17]. The analysis of blood tumor markers revealed the presence of SCC-Ag, CYFRA21-1 [6, 18, 19, 20], CEA, TrxR [6,7]. Although uncharacteristic of this type of cancer, elevated levels of CA 125 have been reported [18]. The blood determinations of these tumor markers can be performed by ELISA biochemical tests, electrochemical determinations on different sensors. Studies on stochastic sensors are known. Stochastic sensors based on maltodextrins with different dextrose equivalent were proposed for the assay of three lung cancer biomarkers: neuron specific enolase, carcinoembryonic antigen and epidermal growth factor receptor. The two sensors proposed can determine simultaneously NSE, CEA and HER-1 in whole blood samples (qualitative and quantitative), with recoveries higher than 97.00 %. This screening test may serve for fast and early detection of lung cancer. [21] Biochemical analysis by ELISA technique has 50% sensitivity at >90% specificity [22] .

A special place has represented by the determination of serological tumor markers for PD-L1 immunity, which demonstrated the superiority of PD-1/PD-L1 inhibitors for patients with advanced squamous NSCLC compared to chemotherapy [12, 23, 24]. Rui-Lian Chen and all conducted thismeta-analysis to investigate the efficacy of PD-1/PD-L1 inhibitors versus chemotherapy for squamous NSCLC patients. Their study included 11 clinical trials involving 3112 patients, which compared the efficacy of PD-1/PD-L1 inhibitors with chemotherapy for advanced squamous NSCLC

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patients. Their observed that PD-1/PD-L1 inhibitors significantly improved OS and PFS of advanced squamous-cell lung cancer when compared with chemotherapy [23].

The analyzed articles for tumor markers were 6, which included both separate markers and groups of markers. 12 markers were found. The analysis of articles is in Table 2.

In the analyzed studies, 6 groups of tumor markers were found analyzed together, depending on the result of which the diagnosis was established.

Table 2. The representative scientific studies that we analyzed for tumor markers alone or in groups, with significance for squamous cell carcinoma.

REFERENCES	7	8	12	18	19	20
AUTHOR	Wei Zhao	Suofu Ye	Urska Janzic	Linjie Liu	Zhong-qing Chen	Rafael Molina
NR PATIENTS	135	1922	54	2097	693	3144
STUDY TYPE	retrospective	retrospective	observational	observational	observational	observational
DIAGNOSTIC YELD	91,30%	90,20%	72%	65,93%	65,93%	unspecified
SENSITIVITY	unspecified	82,50%	unspecified	81,63%	unspecified	88,50%
SPECIFICITY	unspecified	81,30%	unspecified	65,93%	unspecified	82%
SCC-Ag	59,60%	unspecified	unspecified	36,68%	39,80%	4,80%
CYFRA21-1	unspecified	51%	unspecified	61,15%	88,60%	12,60%
CEA	55,80%	33,80%	unspecified	21,55%	23,50%	8,20%
TrxR	unspecified	71,60%	unspecified	unspecified	unspecified	unspecified
NSE	unspecified	21,30%	unspecified	7,51%	unspecified	17,20%
bFGF	65,40%	unspecified	unspecified	unspecified	unspecified	unspecified
CEA+SCC-Ag+bFGF	91,30%	unspecified	unspecified	unspecified	unspecified	unspecified
CA19-9	unspecified	18,80%	unspecified	unspecified	unspecified	unspecified
NSE+ Cyfra21-1 +CA19-9+ CEA+ TrxR	unspecified	83%	unspecified	unspecified	unspecified	unspecified

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NSE + Cyfra21-1 +CA 19-9	unspecified	52,50%	unspecified	unspecified	5,54%	unspecified
PD-L1	unspecified	unspecified	72%	unspecified	unspecified	unspecified
ProGRP	unspecified	unspecified	unspecified	8,27%	unspecified	32,00%
CA125	unspecified	unspecified	unspecified	20,05%	28,90%	unspecified
CEA +CYFRA21-1 + SCC-Ag + ProGRP + CA 125	unspecified	unspecified	unspecified	65,93%	unspecified	unspecified
CEA +CA125 +CA15-3 +CA19-9 +CA72-4 +CYFRA21-1 + SCC-Ag	unspecified	unspecified	unspecified	unspecified	unspecified	unspecified
CA72-4	unspecified	unspecified	unspecified	unspecified	16,90%	unspecified
CA 15-3	unspecified	unspecified	unspecified	unspecified	9%	26,60%
CA15.3 +CEA +CYFRA 21-1 +NSE + ProGRP	unspecified	unspecified	unspecified	unspecified	unspecified	88.50%

3.2. Anatomopathological Characteristics

Macroscopically it is located centrally, frequently at the tracheo-bronchial level, along the major airways, exophytic [13], with a tendency to exfoliation [17], frequently on the membranous area [25], bleeding [3]. Microscopically: cellular changes extend to the entire epithelium of the airways but without reaching the surface. Lesions progressing to CIS show grossly aberrant cytology (including patchy chromatin, variable nuclear size and shape, dyskaryosis, and other abnormal nuclear shapes) that extend throughout the airway epithelium but do not infiltrate the basement membrane [26]. Images of sheets or lobules composed of polygonal malignant cells with eosinophils, cytoplasm and pleomorphic nuclei, with atypical mitosis, along with the existence of pearls of keratosis and the presence of intercellular junctions, have also been encountered [27]. Omar Elsaca and all, stated that acinar, papillary or micropapillary, leptic or solid growth patterns represent the majority of neoplastic gland production in squamous carcinoma [15] . The presence of keratin synthesis by tumor cells, which may also include intercellular desmosomes, is used to diagnose squamous cell carcinoma [15, 28]. Gold-standard for confirmation of neoplasia by bronchoscopy remain biopsy and perform histopathological examination with a positive diagnosis rate in 82% of cases [10].

3.3. Immunohistochemical Markers

Specific for squamous cell carcinoma - p40, CK5/6 and TP63 (p63) [29]; which is also argued by Omar Elsaca & all - expression of p40, p63, CK5 and desmoglein appears in squamous cell carcinoma on immunohistochemical examination [15]. Squamous cell carcinomas confined to the bronchial wall are also known to exhibit two distinct patterns of growth: superficial spread and endobronchial mass lesions. In these cases, the immunohistochemical expressions of p53 and Ki-67 are correlated with survival rates [30].

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3.4. Tomography Findings

On computed tomography scan (CT), primary endobronchial malignancies manifest as a polypoid lesion, a focal sessile lesion, eccentric narrowing of the airway lumen, or circumferential wall thickening [31]. Lung squamous cell carcinoma has a higher incidence of central localization with internal cavities, compared to the rest of lung cancers [32]. Sometimes, the CT examination of endobronchial squamous carcinomas presents as a localized bronchial thickening with a long outgrowth, plated on the wall of the bronchus of about 5 cm [33]. Central mass lesions may show either sheath and occlusion of the segmental or lobar bronchus/endobronchial component or sheath of adjacent vessels [34]. As distinct signs for endobronchial tumors, we frequently encounter the sign of the bronchus [35]. Chang Min Park stated in the study "Tumors in the Tracheobronchial Tree: CT and FDG PET Features", at computed tomography (CT), primary malignant tumors manifest as a polypoid lesion, a focal sessile lesion, eccentric narrowing of the airway lumen, or circumferential wall thickening. Because SCC arises from the surface epithelium, the tumor surface is typically irregular. At fluorine 18 fluorodeoxyglucose (FDG) positron emission tomography (PET), most squamous cell carcinomas show high uptake, whereas adenoid cystic carcinoma and mucoepidermoid carcinoma show variable uptake depending on the grade of differentiation [31]. Yoonah Song conducted a study on 310 patients who presented with lung squamous cell carcinoma simulating benign infectious or inflammatory diseases. Pulmonary squamous cell carcinoma may present as localized, long, continuous, bronchial thickening on CT [33].

Only 4 representative scientific reports were found and analyzed. Bronchial sign, bronchial cutoff sign, polypoid lesion, focal lesion, sessile lesions were followed, wich sensitivity and specificity. All analyzed elements were specified in Table 3.

Table 3. Representative scientific research analyzed for the specific elements of CT examinations.

REFERENCES	**5**	**9**	**33**	**35**
AUTHOR	**Xiaochuan Zhang**	**Tatsuya Imabayashi**	**Yoonah Song**	**Semra Bilaçeroğlu**
NR PATIENTS	366	1021	5	92
STUDY TYPE	retrospect	retrospect	retrospect	prospect
SENSITIVITY	91.40%	95%	unspecif	68%
SPECIFICITY	92.40%	95%	unspecif	68%
DIAGNOST YELD	91.40%	95%	unspecif	68%
POLIPOID LESSIONS	present	present	unspecif	present
FOCAL SESILE LESSIONS	present	present	unspecif	present
CT bronchus sign	present	present	present	present
Bronchial cutoff sign	present	present	present	present
PLATED LESSIONS OF THE WALL	present	present	present	present

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3.5. Bronchoscopy Findings

Bronchoscopy with autofluorescence and that with fluoroscopy detects precancerous bronchial lesions located at the level of the bronchial tree, for squamous cell lung cancer [10, 36]. During these examinations, pathological tissues appear reddish-brown in color, invasive lesions appear as defects easily recognized by bronchial fluorescence [37]. These characteristics specified to the thoracic surgeon help to decide the therapeutic decision of tumor resection with preservation of the lung parenchyma. Autofluorescence bronchoscopy allows the detection of pathological changes by using spectral differences in fluorescence and absorption properties at different levels of normal versus dysplastic epithelium [37].

3.6. Flexible Autofluorescence Bronchoscopy

(AFB) is necessary for the diagnosis of endobronchial tumor formations. This examination highlights mucosal changes in several degrees of evolution - low-grade (mild and moderate) dysplasias, high-grade (severe and in situ carcinoma) and invasive carcinoma [9], and evaluates suspicious endobronchial tumors - malignant changes, by detecting irregularity bronchial mucosa, nodular or polypoid lesions and carina thickening [10]. Sometimes there may also be false-positive imaging aspects of the neoplasm, due to areas of inflammation or a thickened epithelium [38]. Malignant tissues on autofluorescence examination have much less green color and may appear as shades of red, brown, or magenta depending on the AFB system used [39]. Xiaoxuan Zheng and all conducted a retrospective study on 218 cases with 1208 biopsies, by white-light bronchoscope and autofluorescence bronchoscopy, in "Application of Quantitative Autofluorescence Bronchoscopy Image Analysis Method in Identifying Bronchopulmonary Cancer". The paper specified the characteristics of the techniquewhite-light bronchoscope associated with autofluorescence bronchoscopy was able to differentiate between benign and malignant lesion with a high sensitivity, specificity, positive predictive value, and negative predictive value (92.1%, 59.3%, 87.3%, and 71.1%, respectively) [40].

3.7. Other Bronchoscopy Techniques

Performed for the detection of endobronchial squamous carcinoma: narrow-band imaging bronchoscopy (NBI), confocal laser endomicroscopy and laser Raman spectroscopy (LRS), high-magnification bronchoscopy (HMB) and high-definition bronchoscopy (HD) [39].

- NBI uses narrow-band filters that enhance visualization of mucosal and submucosa vessels and assess the abnormal angiogenesis seen in malignant lesions [41]. On NBI examination, tortuous and steeply terminated vessels are more common in squamous cell carcinoma [42].
- Optical coherence tomography (OCT) uses near-infrared light, interacts with tissue architecture as a function of depth, and allows for cross-sectional imaging with specificity close to a histological examination by optical interferometry, with spatial resolution of 3 to 15.

Table 4. The representative scientific research carried out by us for the bronchoscopic examinations used in the discovery and biopsy of lung squamous carcinoma.

	1	2	3	4	5	6	7	8	9	10	11
REFERENCES	**3**	**9**	**10**	**11**	**27**	**35**	**38**	**40**	**42**	**44**	**47**
AUTHOR	**Saibin Wang**	**Tatsuya Imabayashi**	**Camelia Bădescu**	**Zheng Liu**	**Viorel Biciușcă**	**Semra Bilaçeroğlu**	**Jiayuan Sun**	**Xiaoxuan Zheng**	**Bojan Zaric**	**Ankit Gupta**	**Hongling Wang**
NR PATIENTS	531	1021	156	708	38	92	232	218	65	0	38
STUDY TYPE	retrosp	retrosp	prospect	retrospect	descriptive	prospective	meta-analysis	retrospect	descript	review	descript
DIAGNOSTIC YELD	95%	75,9%	84%	89,30%	0	68,00%	95,00%	92,10%	0	95%	93,4%
SENSITIVITY	95%	0	84%	95,70%	0	68%	95%	92,10%	0	95%	93,4%
SPECIFICITY	95%	0	84%	89,30%	0	68%	95%	87,30%	0	95%	93,4%
BRONHOSCOPY/ AFB	0	0	84%	89,30%	0	0	95%	92,10%	0	95%	93,4%
BRONHOSCOPY/NBI	0	0	0	0	0	0	0	0	**NBI**	95%	0
FIBEROPTIC BRONHOSCOPY	**exam**	0	0	0	**exam**	**exam**	0	0	0	0	0

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WHITE LIGHT BRONHOSCOPY	0	0	69,49%	75,60%	0	0	88,53%	62,20%	0	0	86,8%
FLUOROSCOPIC BRONHOSCOPY	0	**exam**	0	0	0	**exam**	0	0	0	0	0
MUCOSAL CHANGES	modified mucosa	modified mucosa	modified mucosa	99%	modified mucosa	modified mucosa	modified mucosa	modified mucosa	Tortuous blood vessels were identified in 72 %	Abnormal vascular patterns include increased vessel growth, tortuous vessels, dotted vessel, and spiral or screw-type vessels	0

4. Discussion

In this review we wanted to establish a correlation of clinical and paraclinical features for endobronchial squamous cell carcinoma. Clinical and paraclinical features were reviewed. These features are vaguely approached in lung cancer diagnosis and treatment guides.

Endobronchial squamous cell carcinoma is one of the most common tumors with this location [15], being the most common type of cancer that is located in the tracheobronchial tree [46]. Symptoms are common to endobronchial tumors: cough, chest pain, recurrent pneumonia [3,4], atelectasis, post-obstructive pneumonia, wheezing [15] and hemoptysis, especially after bronchoscopy with biopsy [3, 15], compared to other types of endobronchial tumors [3].

Usual laboratory analyzes revealed the presence of hypercalcemia in the blood [15,17], compared to the assessment of analyzes for lung adenocarcinoma. Analysis of blood tumor markers detected increased levels of SCC-Ag, CYFRA21-1, CEA [6,18,19,20], in patients with squamous cell carcinoma of the lung, compared to those who presented with adenocarcinoma [18].

CT scans have highlighted the characteristic signs of endobronchial tumors, with different degrees of obstruction of the bronchial tree, the bronchus sign, the cutoff sign, with the prominence of the endobronchial tumor formation [5,9, 31-35]. On closer examination, there are signs of localized thickening of the bronchial wall in squamous cell carcinoma [33], but it is not mentioned in the literature as a specific feature.

Bronchoscopic examinations with autofluorescence highlight the color changes at the level of the basement membrane in malignant formations, due to an abundant vascularization. Neoplastic lesions are represented as dark red images due to mucosal hypertrophy that decrease fluorescence by increasing blood flow to the malignant tissue [47]. Squamous cell carcinoma in situ is detected on bronchoscopic examination with superficial autofluorescence, even if the basement membrane is not involved [46]. Most often, lesions can be detected in the central airways. Sometimes, the therapeutic approach may consist of bronchoscopic interventions [44]. Central squamous cell carcinoma lesions are known to invade the basement membrane but maintain the bronchus cartilage and do not invade it [44]. Squamous cell carcinomas confined to the bronchial wall show two distinct patterns of growth: superficial spread and endobronchial mass lesions [30]. Compared with lung squamous cell carcinoma, adenocarcinoma in situ, the preinvasive form, is mostly located in the lung parenchyma; it is usually diagnosed on resected tissue [44, 47].

Bronchoscopy with Narrow Band Imaging (NBI) demonstrated tortuous blood vessels in 72% of patients with squamous cell carcinoma of the lung, compared with 8% in adenocarcinoma [42].

Taking biological biopsy samples of tumor tissue or suspected to be tumor tissue, by autofluorescence bronchoscopy, has a high accuracy in the diagnosis of anatomopathological certainty "gold standard", immunohistochemistry [48].

Confirmation of histologic diagnosis determines the surgical resection of early-stage disease, while pathologic grading and molecular testing allow for personalized tumor type selection, adjuvant therapy, and genotype-based treatment regimen, meant to improve survival in advanced-stage patients [13].

Recognition of clinical signs, circulating tumor markers, characteristics of computed tomographic examination and types of bronchoscopic investigations, participate in an early detection of this type of tumor. The approach of a personalized therapy, with a view to a surgical treatment to preserve the lung parenchyma, led us to carry out this review.

5. Limitation

The specialized literature has a small number of researches on this topic.

6. Conclusions

Endobronchial squamous cell carcinoma is one of the most common tumors with endoluminal development, which overcomes the structure of the bronchus more difficult. Knowledge of clinical and paraclinical features can contribute to early detection. Patients can benefit from personalized therapy and lung parenchymal-conserving surgery. The update of clinical and paraclinical characteristics of endobronchial squamous cell carcinoma opens new horizons for scientific research with the aim of early detection. Lung parenchymal conserving surgery with resection with bronchoanastomosis will be able to be practiced more frequently, so as to increase the survival rate of this type of patients.

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