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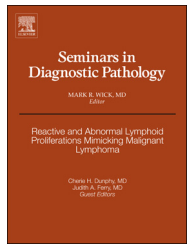

# Colloid carcinoma of the lung: Current views

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ARTICLE INFO

ABSTRACT

Colloid carcinomas of the lung are rare and unusual neoplasms. These tumors need special attention in order to be properly coded as primary pulmonary tumors as they closely resemble their extrathoracic counterparts in their morphologic and immunohistochemical characteristics. Even though, the latest version of the World Health Organization (WHO) has trivialized this entity into garden variety of adenocarcinomas, recently proposed guidelines on pulmonary adenocarcinomas have created some potential to bring back the controversy that appeared to have been settled a decade ago regarding these tumors. Thus, the current review will highlight not only the current concepts but also will bring the historical perspective in an effort to clarify some misconceptions regarding this rare entity.



## Introduction

In 1992, the term "colloid carcinoma" was used for the first time to describe a rare group of primary lung tumors characterized by abundant extracellular mucin and scant neoplastic epithelium. The authors presented the largest series of these cases reported in the literature and attempted to unify several tumors that despite sharing similar histopathological features had been defined under different names ranging from benign to borderline to malignant, as a single entity.[1–7] They proposed that the tumors previously described as "unilocular or mutilocular mucinous tumors" most likely belong to the same group of tumors. They also showed that these neoplasms have the potential to spread outside of the thoracic cavity including brain and bone among other sites.[7] The term "colloid carcinoma" was subsequently adapted by the most recent WHO classification of lung and pleural tumors,[8] as was "mucinous cystadenocarcinoma," a tumor that following definition of colloid carcinoma described by Moran et al. clearly belonged to that category. The WHO also devoted a separate chapter for the entity of "mucinous cystadenoma" as an ambiguous entity that also seemed to represent part of the spectrum of colloid carcinoma. More recently, in proposed guidelines on the classification of lung adenocarcinoma,[9] the authors actually addressed the issue of mucinous cystadenocarcinoma and proposed to merge it to colloid carcinoma but made additional suggestions that might bring back the confusion that was present before the 1992 publication and designation of these tumors as "colloid carcinoma."

## Historical perspective

The historical background of colloid carcinoma is filled with controversial terms, which in part showed the concept on the behavior of these tumors. The Table shows the different terminologies used over the past few decades to describe these tumors. However, the most salient aspect of these terms is the fact that all of those case reports or series of cases, judging by the illustrations provided and the description of the tumor(s) presented, essentially described the same entity. Also important to highlight is the fact that due to the indolent nature of the tumor(s) described, most authors avoided the term "carcinoma." It was not until a larger series of cases highlighting the similar histological features of these tumors and providing evidence of the malignant potential of

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**Table – Previous terminology used to designate colloid carcinomas of the lung.**

| |
|---|
| Mucinous cystadenoma[1] |
| Mucinous cystic tumor[3] |
| Cystic mucinous adenocarcinoma[4] |
| Adenocarcinoma arising in a mucinous cystadenoma[5] |
| Pulmonary mucinous cystic tumors of borderline malignancy[6] |

these tumors that the entity known as "colloid carcinoma" became an acceptable term.

## Pathological features

### *Macroscopic features*

Even though in the past, high importance was given to the macroscopic features of this tumor, it is important to highlight that such importance was given in order to try to separate benign mucinous cystic lesion from malignant cystic lesions. However, in all probabilities, such concept is flawed as these lesions may present as unilocular or multilocular tumors. Although the cystic features may not be readily apparent on gross examination, they are unanimously present on microscopic examination. These tumors often have a mucoid consistency, occasionally with small cystic areas filled with gelatinous material. They can be irregular or well demarcated with varying size from 1 to more than 10 cm in the greatest diameter.

### *Histopathological features*

The low magnification of these tumors has the characteristic pools of extracellular mucin replacing the normal lung parenchyma (Fig. 1). In some areas, the outlines of alveolar wall broken by the presence of mucin are evident (Fig. 2). Floating within the pools of mucin, fragments of fibroconnective stroma lined by neoplastic mucinous epithelium often without overt atypia are seen (Fig. 3). Close view reveals the presence of remnants of alveolar walls lined by mucin-containing tumor cells arranged in short cord or singly (Figs. 4 and 5). In some cases, signet ring cells may appear to be floating in the pools of mucin. Even though the majority of the tumor is composed of mucinous pools, accounting for >90% of the tumor in most cases a solid component comprising of conventional adenocarcinoma may be present in a subset of cases. However, such solid component in the majority of cases is only minimal.

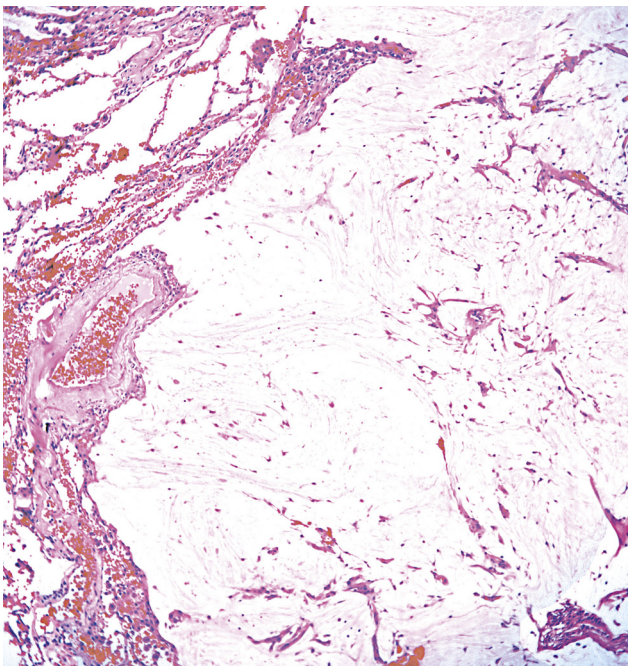

**Fig. 1 – Low-power view of a colloid carcinoma showing extensive pools of mucinous material replacing normal lung parenchyma.**

### *Immunohistochemical features*

These tumors characteristically show positive staining for CK7, CK20, and CDX2 (Figs. 6–9). CK20 expression varies from focal to diffuse, while CK7 expression is almost always strong and diffuse. TTF-1 and Napsin stains are frequently negative in the tumor (unpublished data).

### *Molecular features*

These tumors frequently lack *EGFR* mutation or *EML4/ALK* gene rearrangement. *KRAS* mutation can occur in a subset of these tumors (unpublished data).

## Discussion

The term "colloid" lung carcinoma may appear as an obvious name; however, the literature prior to 1992 was filled with numerous terms, and to some extent misconceptions about this tumor. These reports seem to describe pulmonary lesions

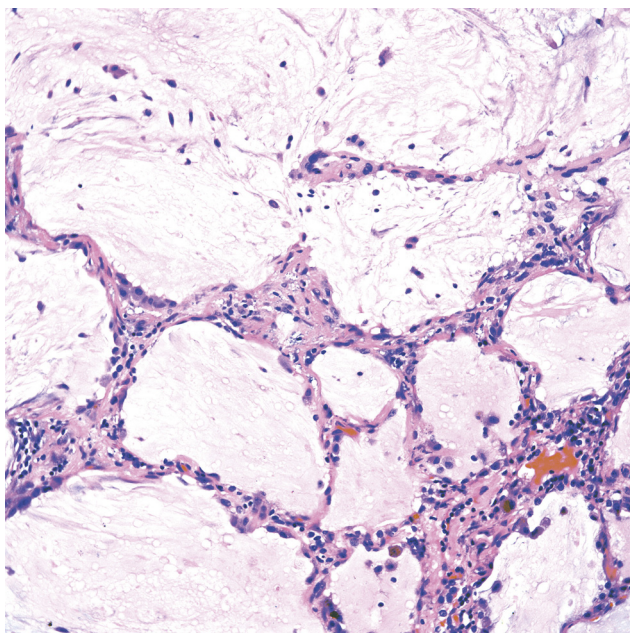

**Fig. 2 – Colloid carcinoma showing partial retention of the alveolar architecture.**