



Nadir and Finical-Minimally Invasive Adenocarcinoma Lung

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Abstract

Minimally invasive adenocarcinoma emerges as a miniature, solitary, localized, primary pulmonary adenocarcinoma ≤ 3.0 centimetre magnitude and ≤ 0.5 centimetre zone of stromal invasion or non-invasive (lepidic) pattern of neoplastic evolution. Minimally invasive adenocarcinoma lung is predominantly comprised of non-mucinous component and is confined within peripheral pulmonary parenchyma. Preponderantly asymptomatic, poorly defined areas appear concurrent with lepidic pattern of tumour growth whereas solid foci are concordant with focal tumour invasion. Cogent histopathological subtypes appear as non-mucinous variant, mucinous variant and mixed variant. Stromal invasion configures acinar, papillary, micropapillary, solid, colloid, foetal or invasive mucinous lesions. Neoplastic cells appear immune reactive to CK7, thyroid transcription factor-1 (TTF-1) or Napsin A and immune non-reactive to p40. Minimally invasive adenocarcinoma lung requires segregation from neoplasms such as invasive pulmonary adenocarcinoma, lepidic predominant pattern, adenocarcinoma in situ or atypical adenomatous hyperplasia lung. The gradually progressive neoplasm demonstrates 'ground glass' opacities. Appropriate neoplastic discernment necessitates comprehensive histological assessment of entire surgical resection specimens. Minimally invasive adenocarcinoma lung can be appropriately treated with surgical extermination of the neoplasm followed by extensive monitoring. Neoplasm is devoid of lymphatic invasion, vascular invasion, tumour necrosis or pleural invasion.

Keywords: Non Mucinous; Lepidic Pattern; Ground Glass Opacity

Abbreviation: TTF-1: Thyroid Transcription Factor-1.

Introduction

Minimally invasive adenocarcinoma emerges as a miniature, solitary, localized, primary pulmonary adenocarcinoma representing ≤ 3.0 centimetre tumour magnitude in greatest dimension and ≤ 0.5 centimetre zone of stromal invasion or a distinct non-invasive (lepidic) pattern of neoplastic evolution.

Minimally invasive adenocarcinoma lung is comprised of distinctive, pure 'lepidic' or predominant lepidic pattern

of tumour evolution with neoplastic cells disseminated along alveolar structures. Tumour magnitude appears < 3.0 centimetres wherein invasive or non-invasive (lepidic) components appear < 0.5 centimetres. Subcategory of invasive neoplastic component may appear diverse from the lepidic component. Generally, minimally invasive adenocarcinoma lung is constituted of non-mucinous component although mucinous component may exceptionally be encountered. Minimally invasive adenocarcinoma lung is additionally designated as micro-invasive adenocarcinoma. Previously scripted as bronchoalveolar carcinoma by Malassez in 1876, neoplasm may configure as a bilateral, multinodular subcategory of malignant pulmonary neoplasm. However,

previously adopted terminology of bronchoalveolar carcinoma appears obsolete [1]. Neoplasm is devoid of lymphatic invasion, vascular invasion, tumour necrosis or pleural invasion. Minimally invasive adenocarcinoma lung commonly incriminates Asians. A mild female preponderance or an equivalent gender predilection is encountered [2,3]. Commonly, minimally invasive adenocarcinoma is confined within peripheral pulmonary parenchyma.

Minimally invasive adenocarcinoma lung is posited to arise as a multistep progression from preceding lesions as atypical adenomatous hyperplasia and adenocarcinoma in situ evolving towards minimally invasive adenocarcinoma [2,3]. Factors contributing to emergence of minimally invasive adenocarcinoma lung appear as cigarette smoking or tobacco consumption. Nevertheless, the concordance appears tenuous, in contrast to concurrence of cigarette smoking with various subtypes of pulmonary adenocarcinoma [2,3]. Minimally invasive adenocarcinoma emerges as an asymptomatic lesion. Tumefaction may be discovered incidentally. Upon computerized tomography, an admixture of solid and ground glass lesions are encountered.

Minimally invasive adenocarcinoma lung manifests with a magnitude of ≤ 3.0 centimetres in greatest dimension and ≤ 0.5 centimetre zone of stromal invasion [2,3]. Tumefaction represents as a poorly defined, firm, grey/white tumour nodule demonstrating solid areas. Tumour nodule appears

to be confined within peripheral pulmonary parenchyma. Poorly defined areas appear concurrent with lepidic pattern of tumour growth whereas solid foci are concordant with focal tumour invasion. Tumour necrosis or overt zones of pleural invasion appear absent [3,4]. Upon microscopy, the primary pulmonary minimally invasive adenocarcinoma demonstrates ≤ 0.5 centimetre zone of stromal invasion delineating non lepidic pattern of tumour progression. Aforesaid patterns of stromal invasion may configure as acinar, papillary, micropapillary, solid, colloid, foetal or invasive mucinous lesions. Cogent histopathological subtypes appear as ~non-mucinous variant which is commonly discerned ~mucinous variant composed of mucus secreting goblet cells.

The exceptionally exemplified lesion is frequently multi-centric. ~mixed variant Characteristically, foci of stromal invasion delineate angulated glandular structures encompassed by desmoplastic stroma. Cytological and nuclear atypia is enhanced [3,4]. Quantifiable, enlarged foci of tumour invasion configure as focal tumour invasion. Multiple foci of invasion may be assessed as total percentage of invasive cytological components within singular section calculated against greatest tumour dimension. Minimally invasive adenocarcinoma lung is composed of an aggregate invasive magnitude of ≤ 0.5 centimetres (Table 1). Foci of tumour necrosis, lymphatic invasion, vascular invasion, pleural invasion and tumour dissemination through alveolar spaces appear absent [3,4] (Figures 1 & 2).

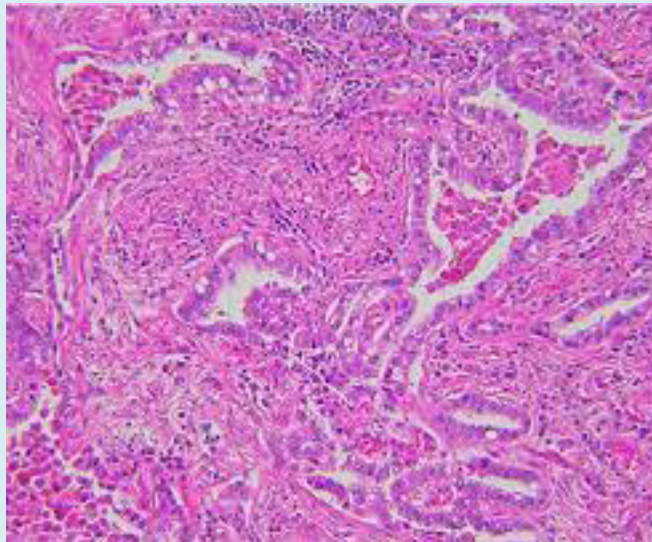


Figure 1: Minimally invasive adenocarcinoma delineating predominant lepidic pattern with neoplastic cells layering alveolar spaces. Foci of invasion within subjacent stroma are encountered [7].

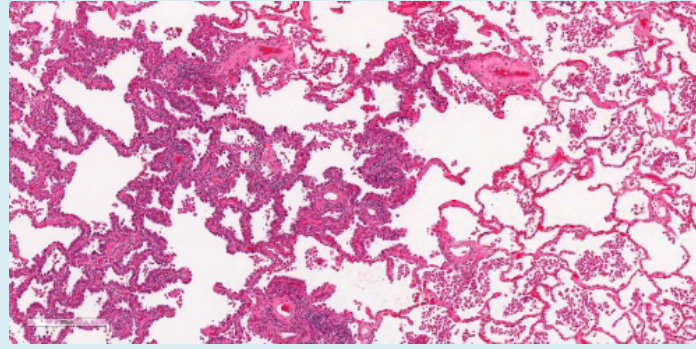


Figure 2: Minimally invasive adenocarcinoma demonstrating preponderant lepidic pattern with tumour cells layering alveolar spaces. Foci of invasion within encompassing stroma are evident [8].

Subtype	Epidemiology	Immunohistochemistry	Molecular Alterations
PEAC	M>F, smokers (0.5%)	CK7, CDX-2, villin	KRASG12V, ERBB2, EGFR-del ex19, L858R
Foetal adenocarcinoma	Young female, smokers (0.5%)	Synaptophysin, vimentin	WNT signal
Colloid adenocarcinoma	F>M, smokers (0.1%)	CK7, CK20, CDX-2, MUC2	KRAS codon 12/13
NOS carcinoma	M>F(0.1%)	TTF-1, p40, none	EGFR, ALK-EML4

Table 1: Characteristics of Pulmonary Adenocarcinoma [4].

PEAC: Pulmonary enteric adenocarcinoma, NOS: Not otherwise specified, TTF-1: thyroid transcription factor-1.

Minimally invasive adenocarcinoma lung appears immune reactive to CK7, thyroid transcription factor-1 (TTF-1) or Napsin A. Neoplastic cells appear immune non-reactive to p40 [5,6].

Minimally invasive adenocarcinoma lung requires segregation from neoplasms such as invasive pulmonary adenocarcinoma, lepidic predominant pattern, adenocarcinoma in situ or atypical adenomatous hyperplasia lung [5,6]. Minimally invasive adenocarcinoma lung emerges as a gradually progressive neoplasm demonstrating 'ground glass' opacities. Surgical tissue samples exhibit adenocarcinoma with lepidic pattern of tumour evolution. Appropriate neoplastic discernment necessitates comprehensive histological assessment of entire surgical resection specimens. Disease detection upon examination of limited surgical tissue appears challenging [5,6]. Upon radiography, preliminary lesions may represent as a 'ground glass' opacity. Alternatively, solid tumour nodule may be discerned. Foci of tumour invasion appear as solid and circumscribed by pulmonary parenchyma delineating ground glass opacities. Fluorodeoxyglucose positron emission computerized tomography (FDG PET/CT) may be beneficially adopted to discover pulmonary lesions demonstrating sub solid or ground glass opacities and a solid component ≥ 8 millimetre diameter [5,6]. Minimally invasive adenocarcinoma lung can be appropriately treated with surgical extermination of the neoplasm. Meticulous

monitoring is recommended. Adjuvant chemotherapy or radiotherapy may be adopted for treating subjects unamenable to various surgical manoeuvres [5,6]. Minimally invasive adenocarcinoma lung, expressing pathological stage T1mi is associated with favourable prognostic outcomes, in contrast to preliminary stage of invasive adenocarcinoma (T1a). Thus, appropriate demarcation is necessitated. Comprehensive surgical extermination of the indolent tumefaction is associated with $\sim 100\%$ disease free survival [5,6].

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7. Image 1 Courtesy: Research gate.

8. Image 2 Courtesy: Pathology outlines.

