BRONCHIOLITIS

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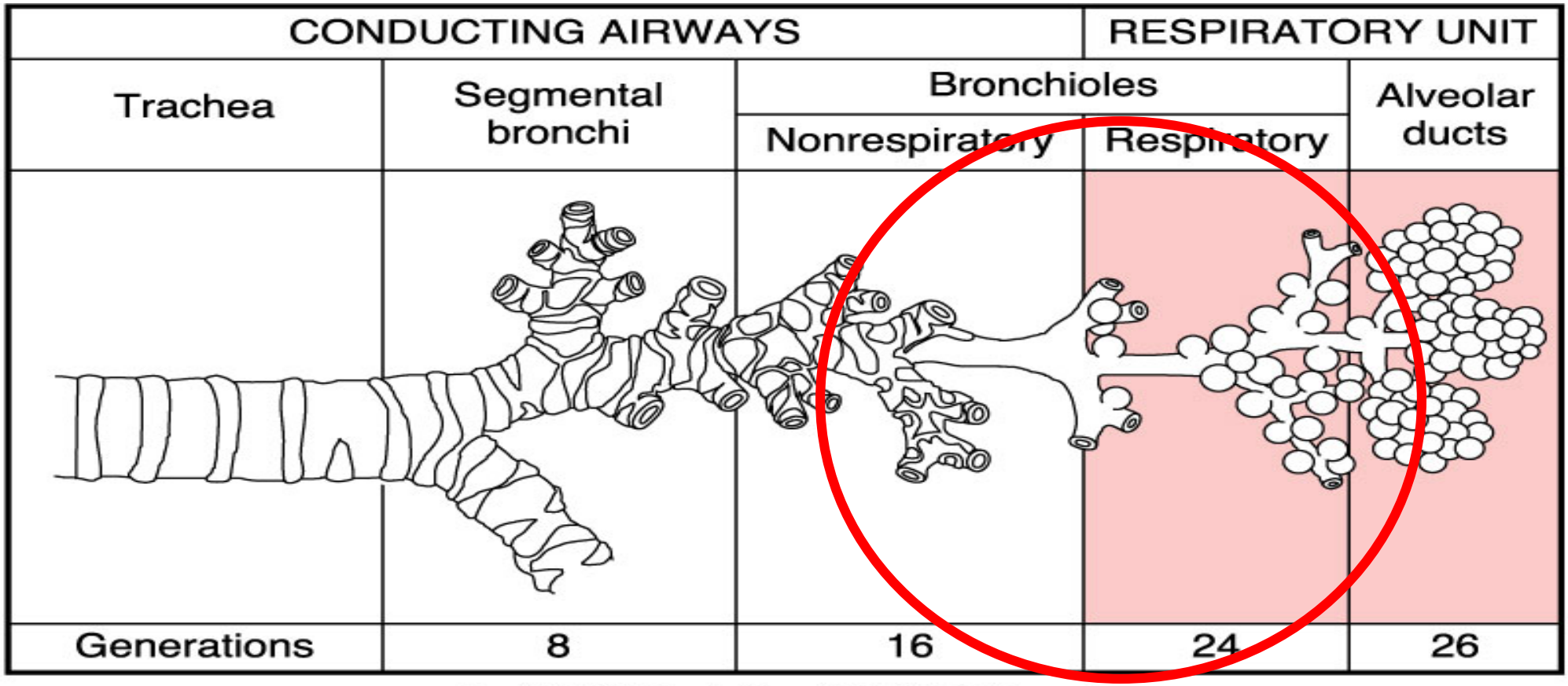
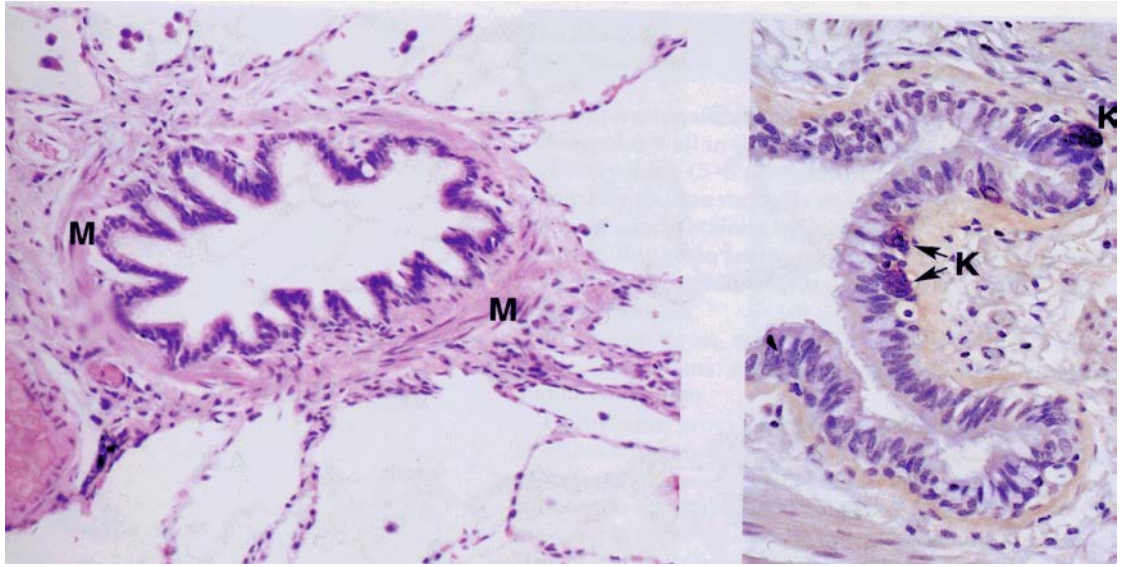
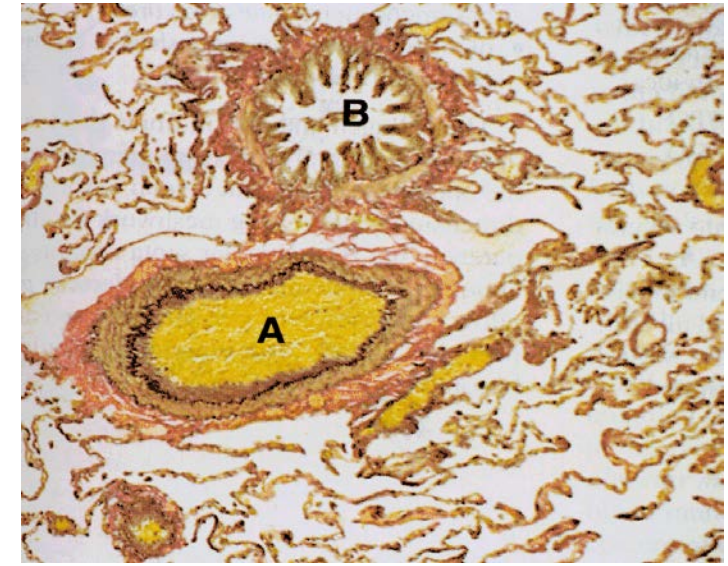
Adult Bronchiolitis: definition

Bronchiolitis is a process centered in and around membranous and/or respiratory bronchioles with sparing of a considerable portion of the other parenchymal structures



The distribution and amounts of the cellular and mesenchymal components vary from case to case and are at the basis of the variety of histopathological, radiographic and clinical aspects of bronchiolitis.





BRONCHIOLITIS

- Pathological classification
- Radiological classification
- Clinical entities

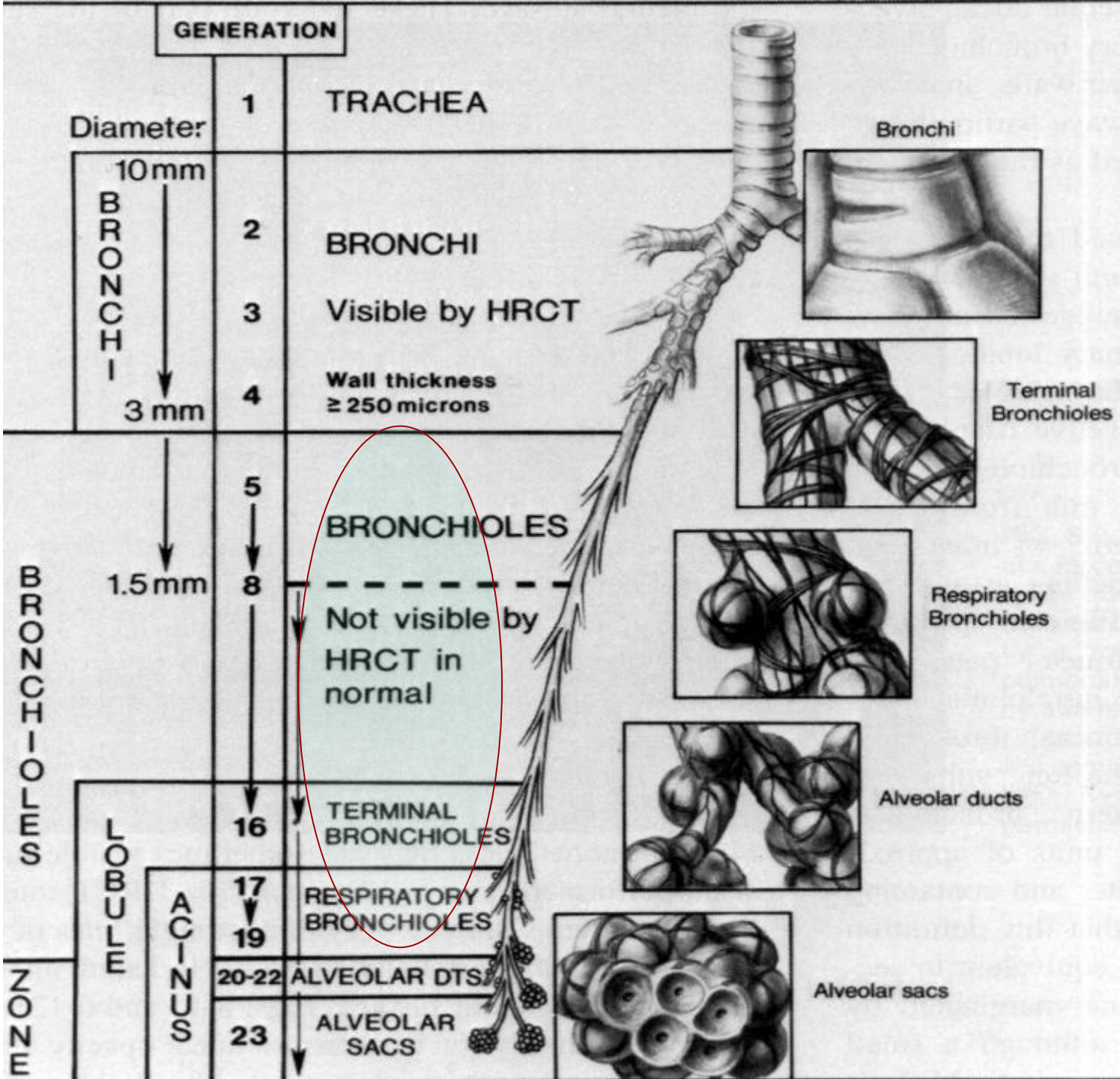
Morphologic classification of Bronchiolitis simplified for Clinicians

*Cellular bronchiolitis

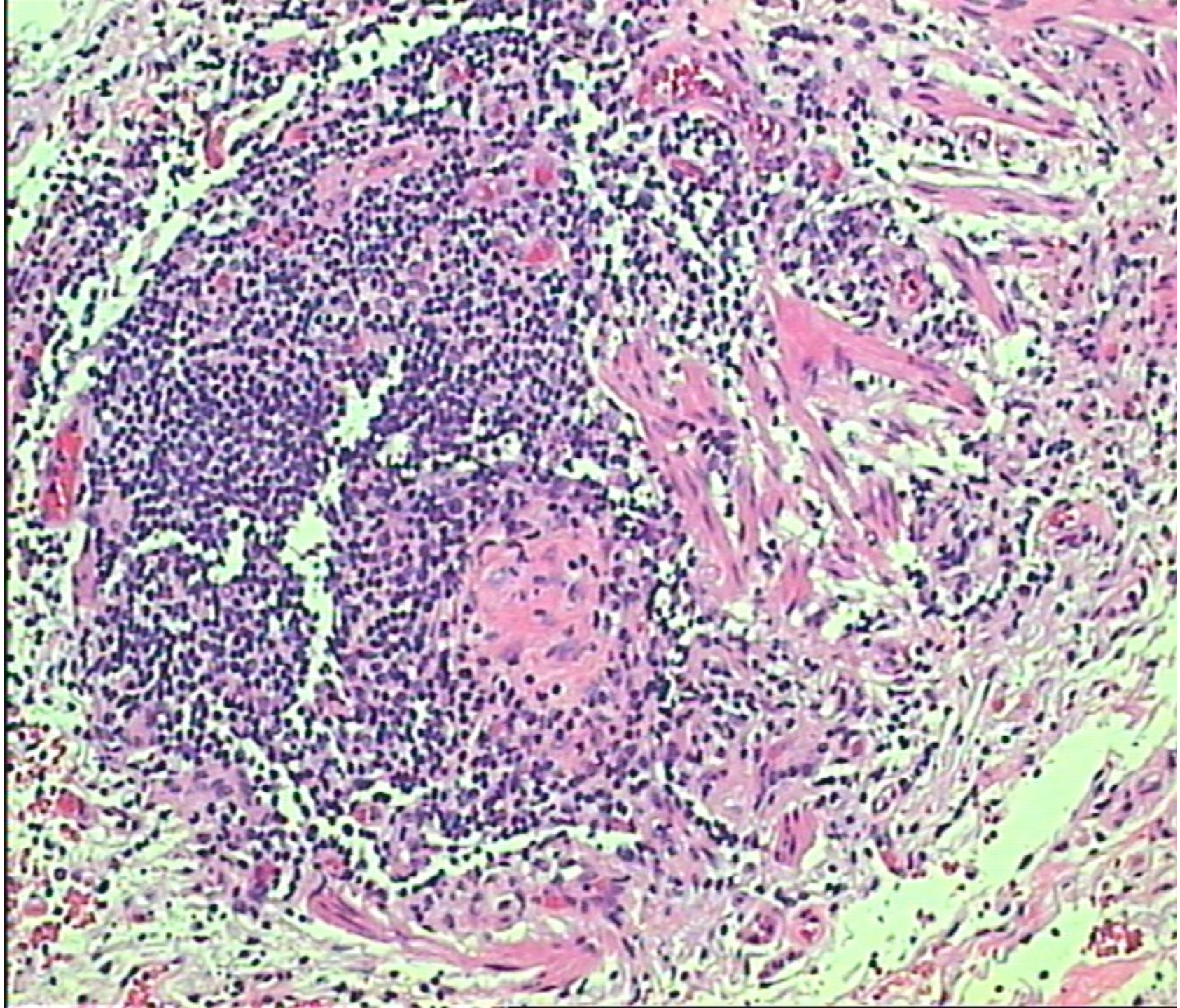
*Proliferative bronchiolitis

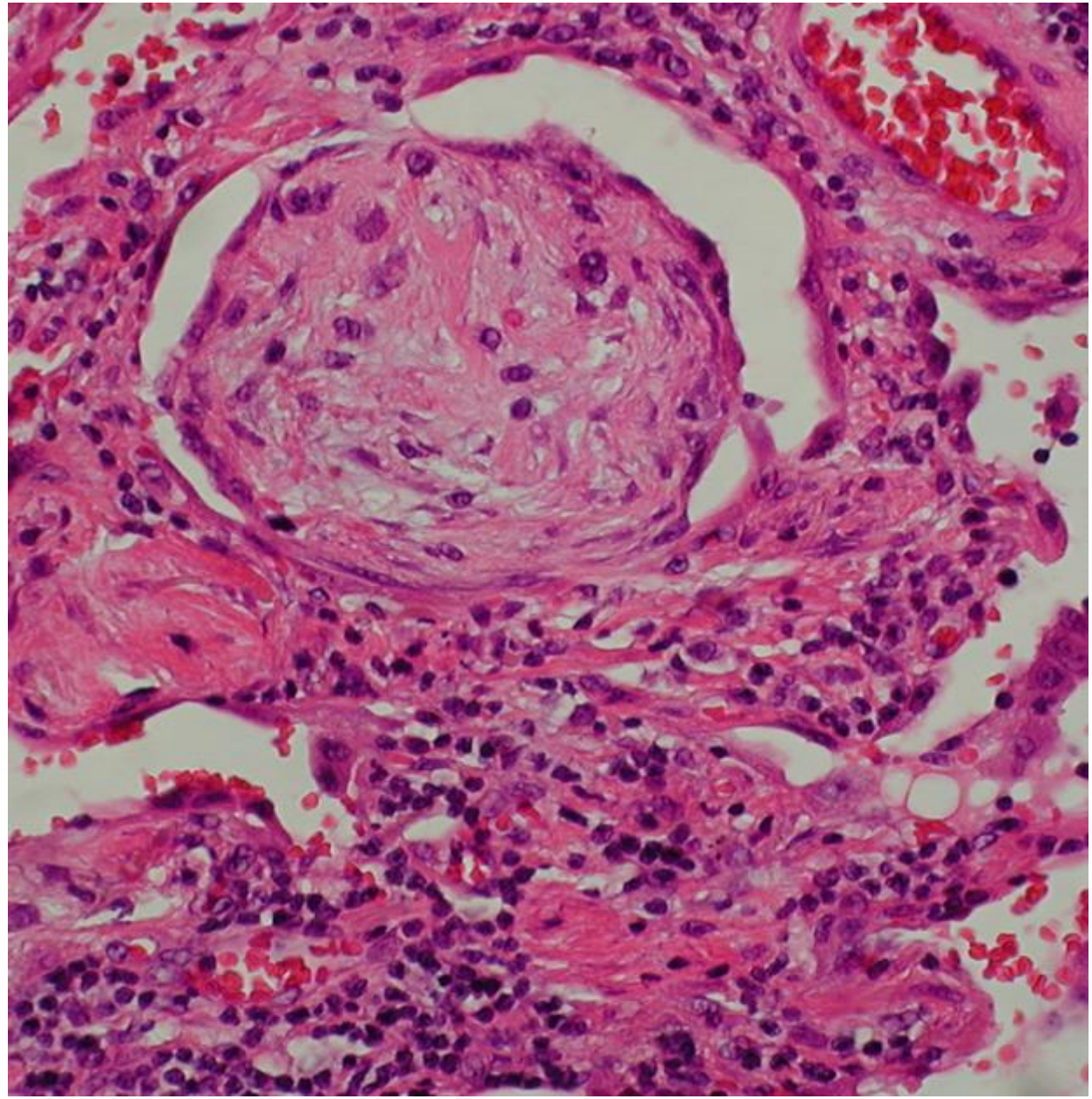
*Cicatritial bronchiolitis

*Bronchiolar metaplasia

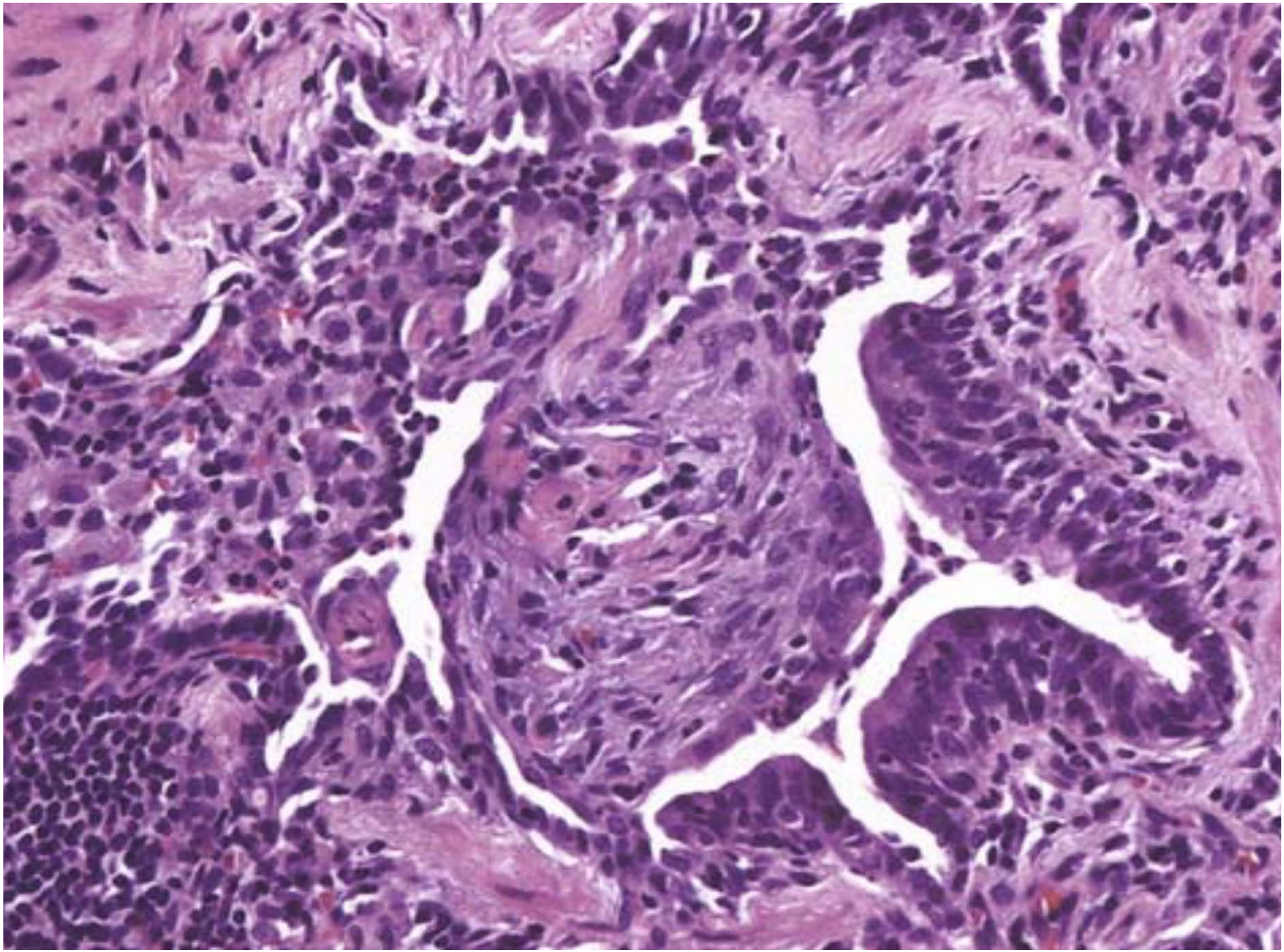


CELLULAR BRONCHIOLITIS

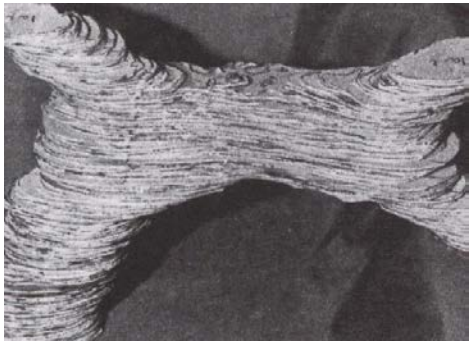




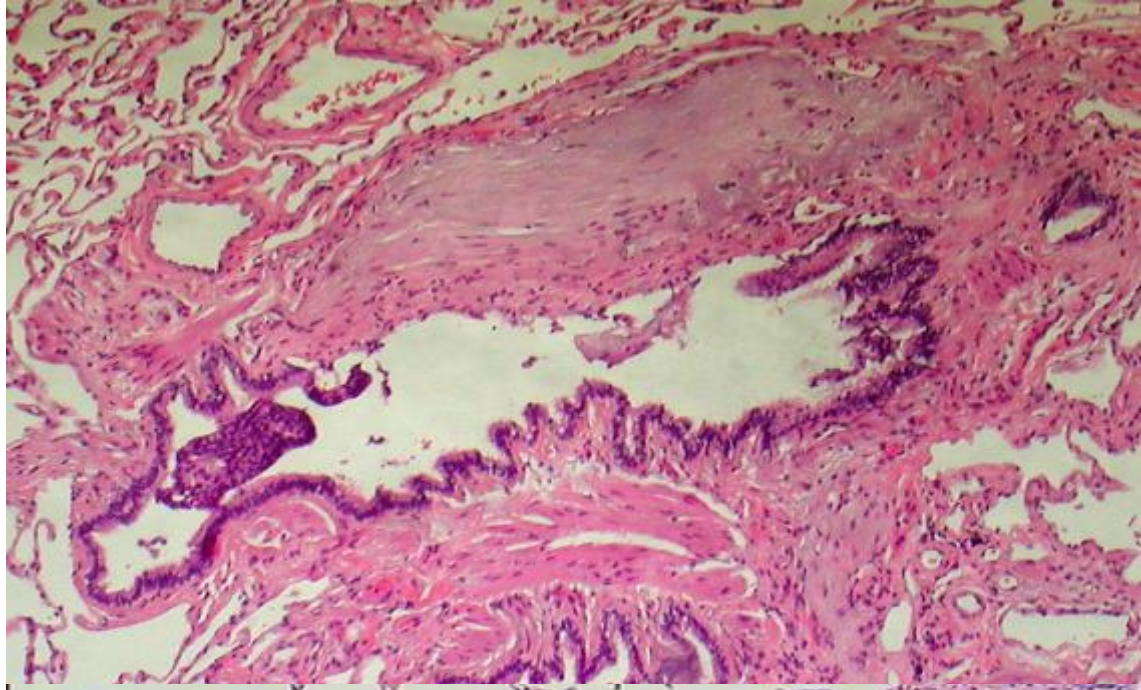
Bronchiolitis with inflammatory polyps

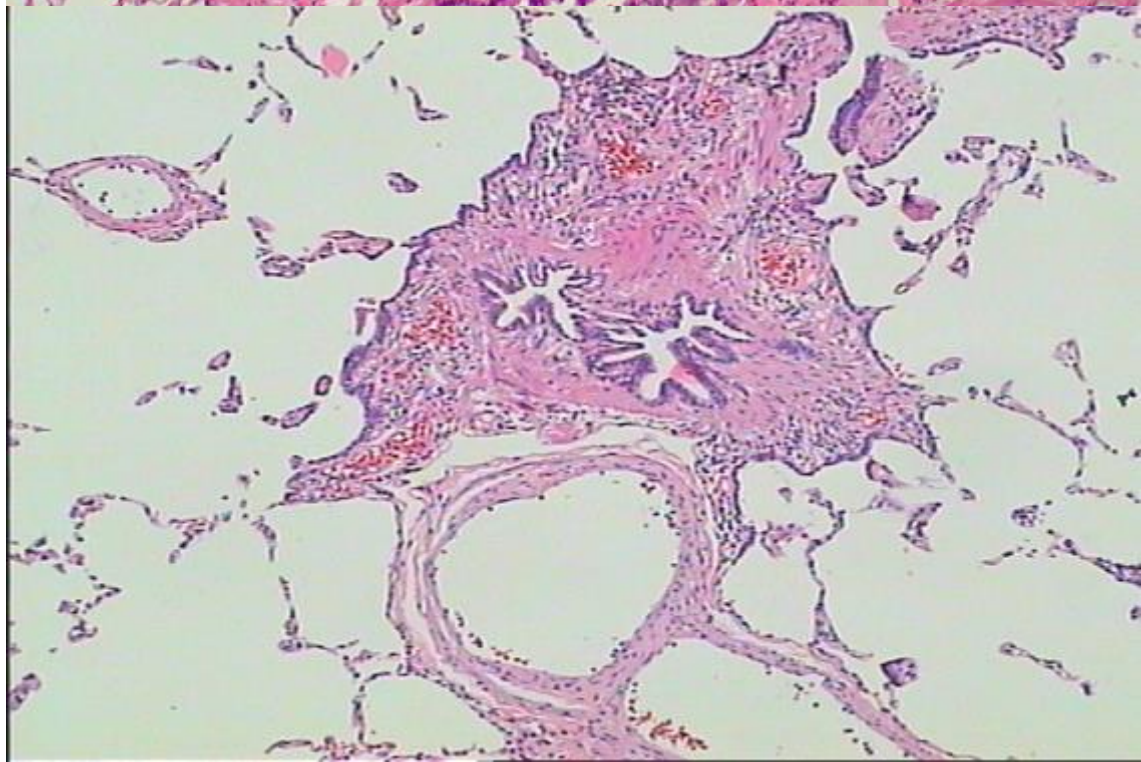


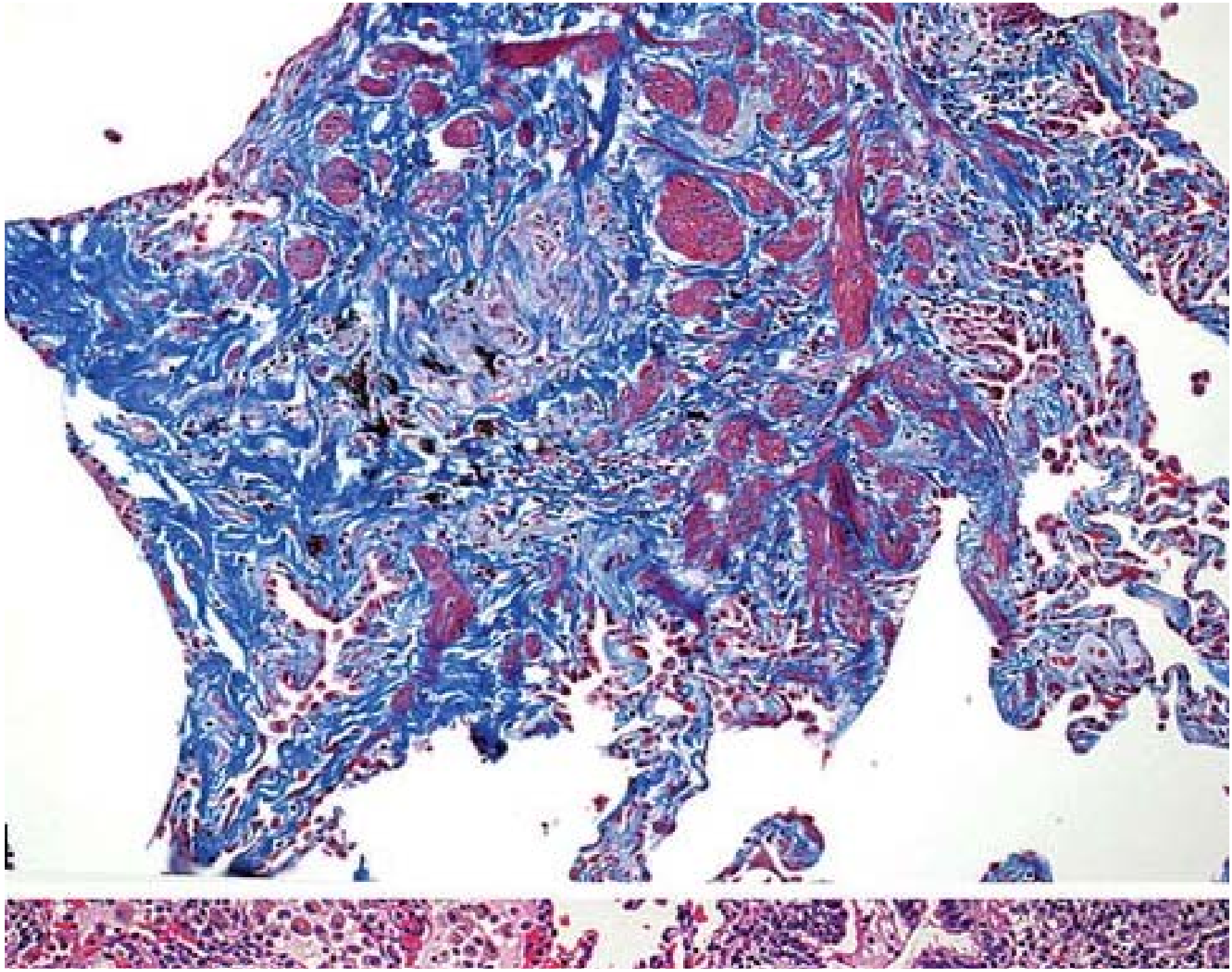
Cicatritial (constrictive) bronchiolitis

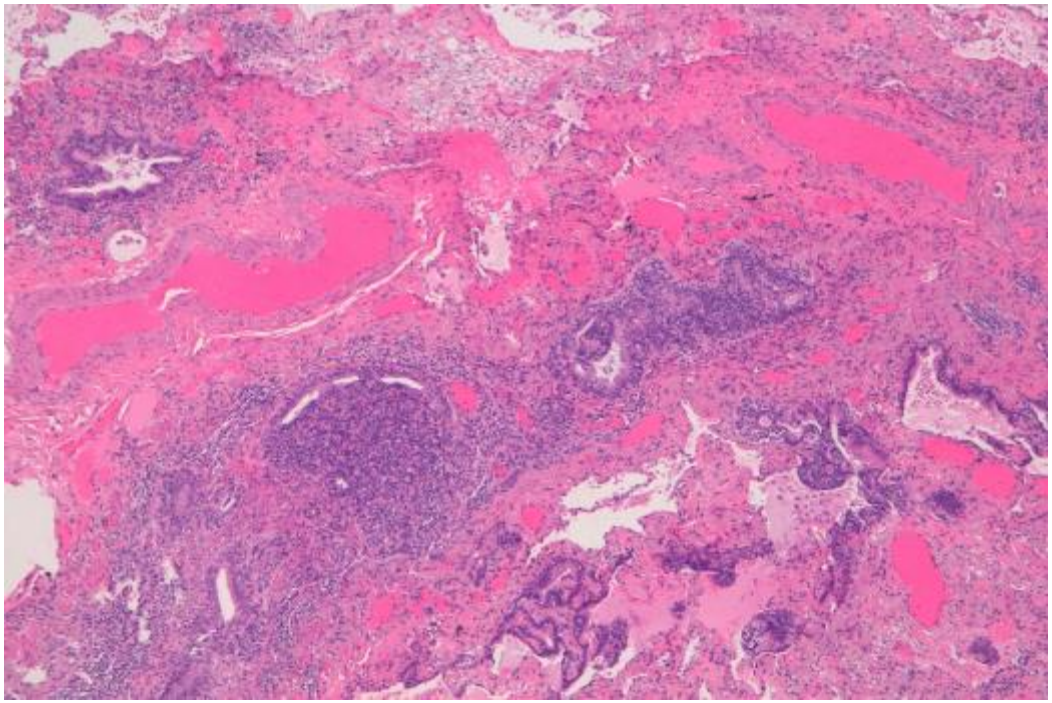


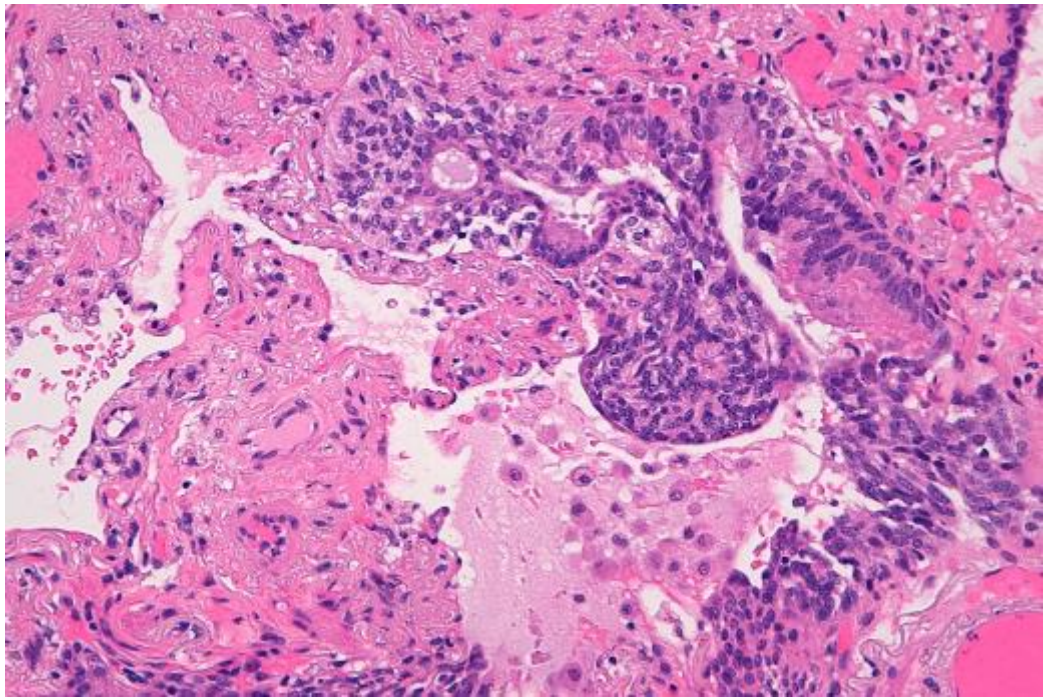
There is a mural thickening of membranous bronchioles caused by submucosal collagenization











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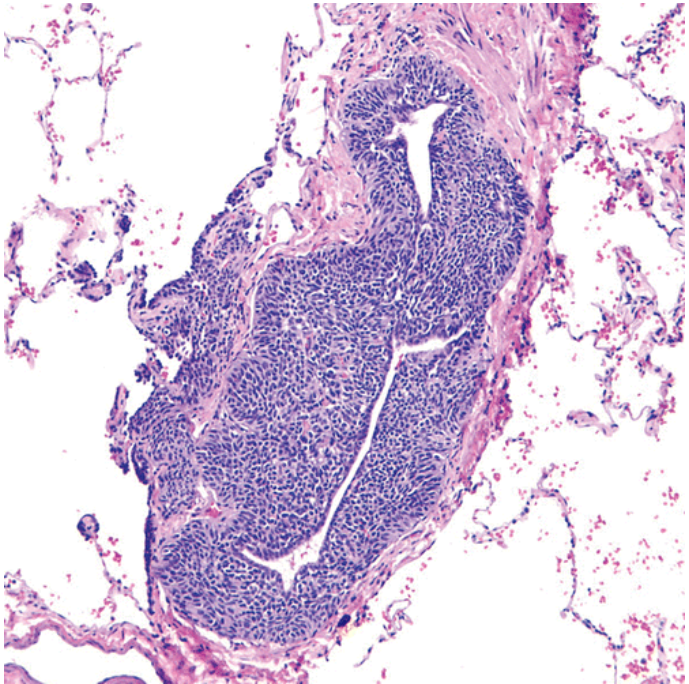
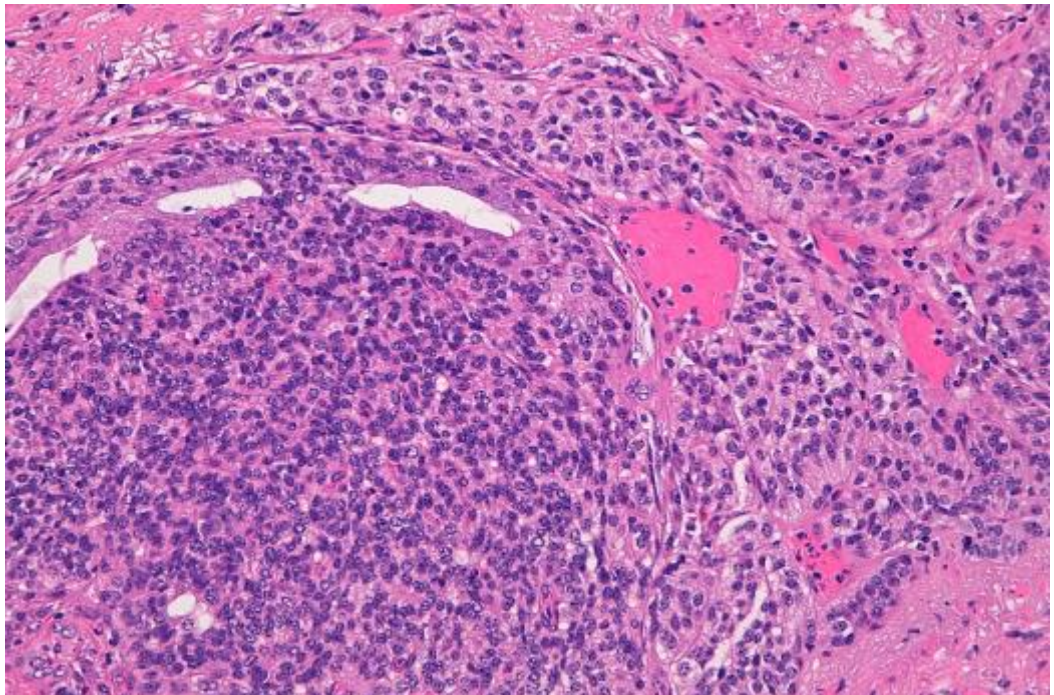
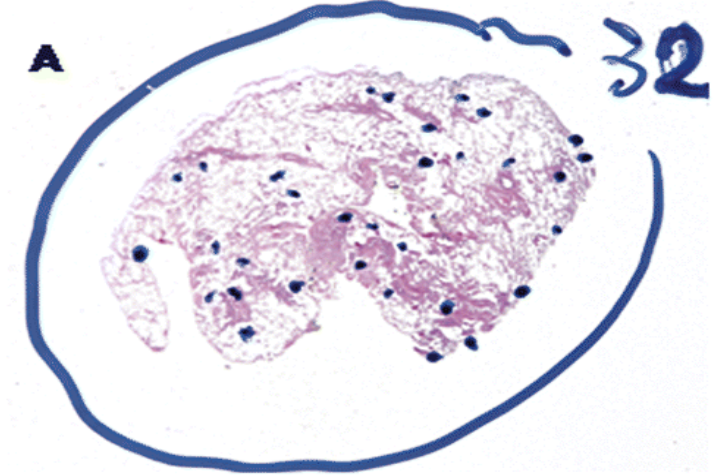
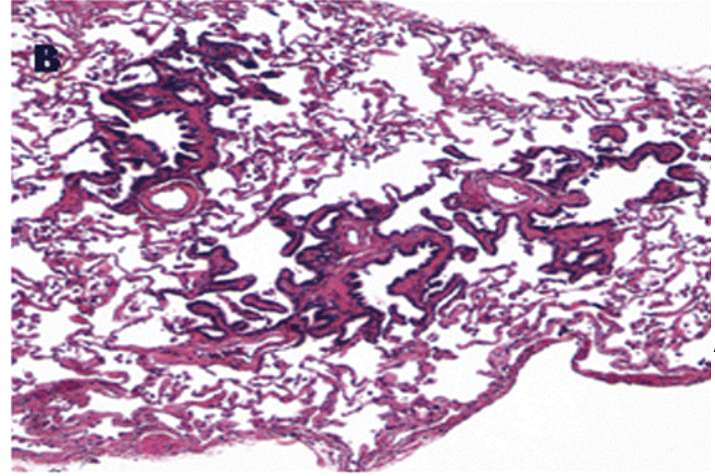






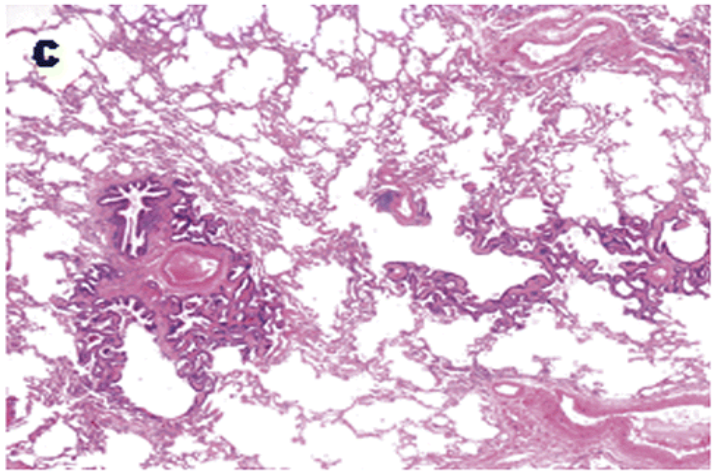


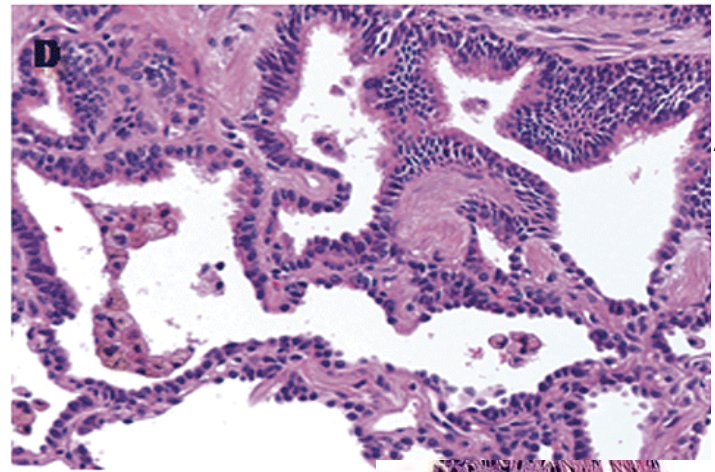
Fukuoka J, et al.

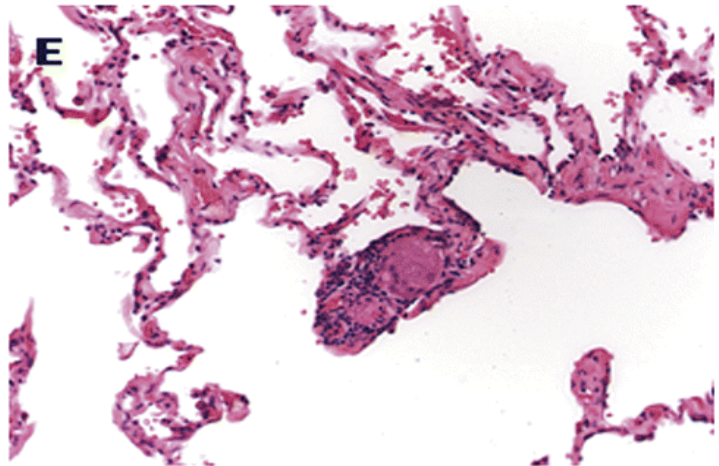
Peribronchiolar metaplas

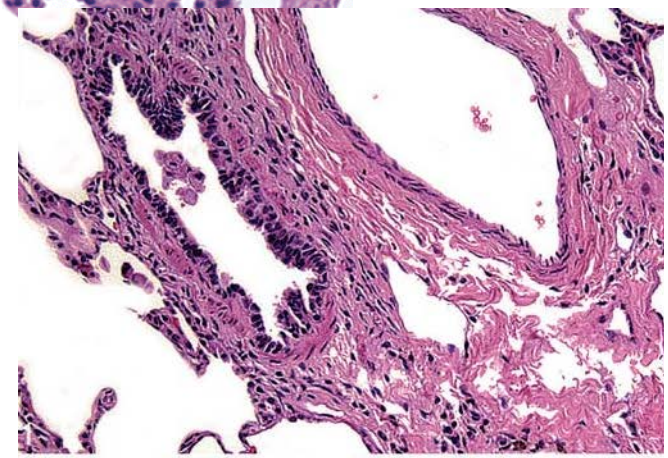
A common histologic lesion
in diffuse lung disease
and a rare cause of
interstitial lung disease.

AJSP 2005, 29:948-954



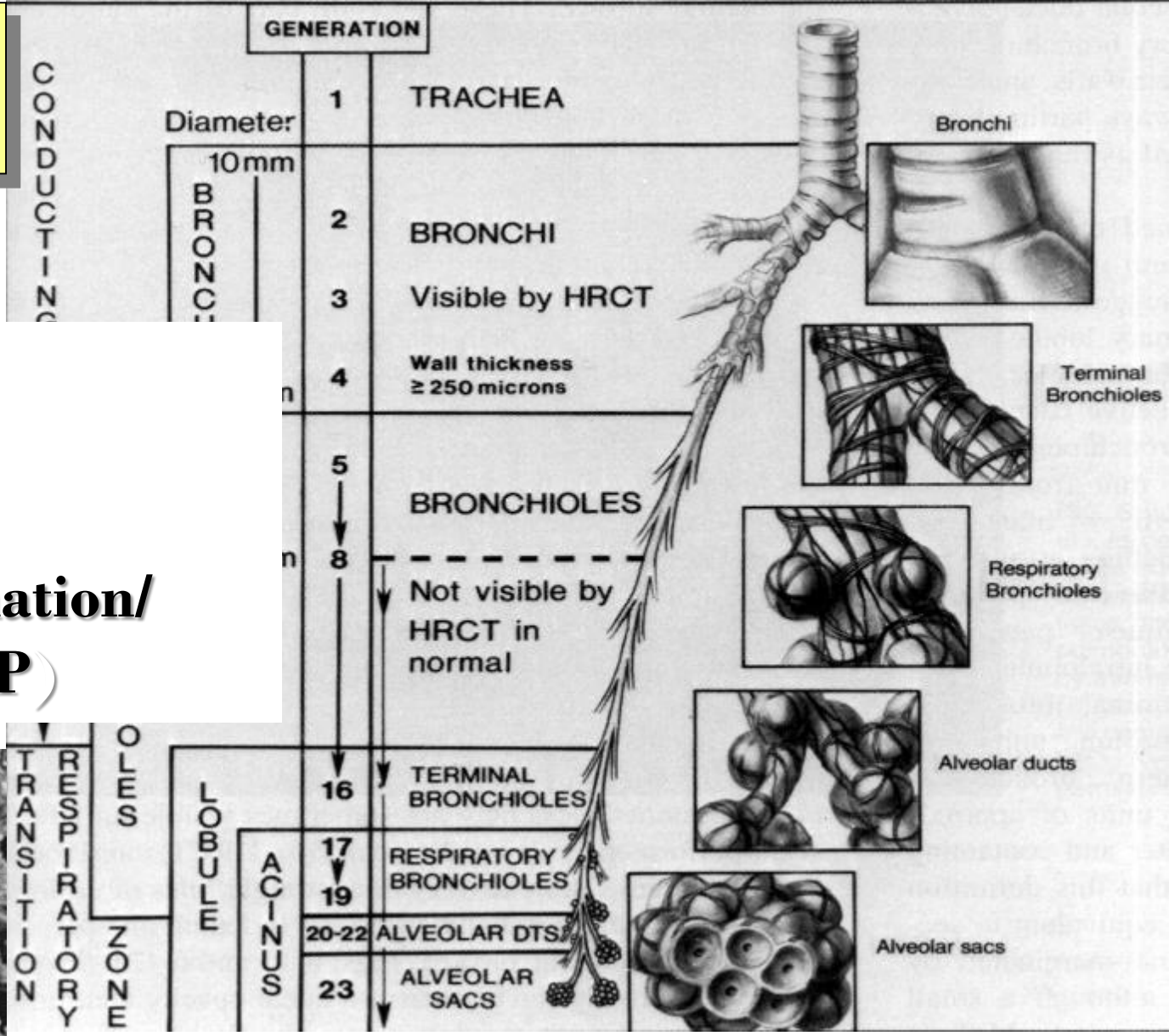






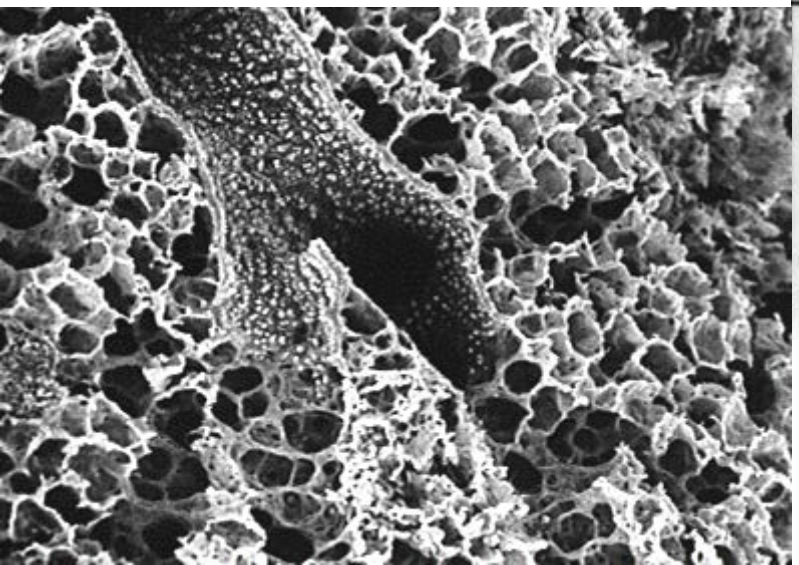
Generazioni bronchiali

Da Naidich et al "Ct and MR of the thorax" 1999

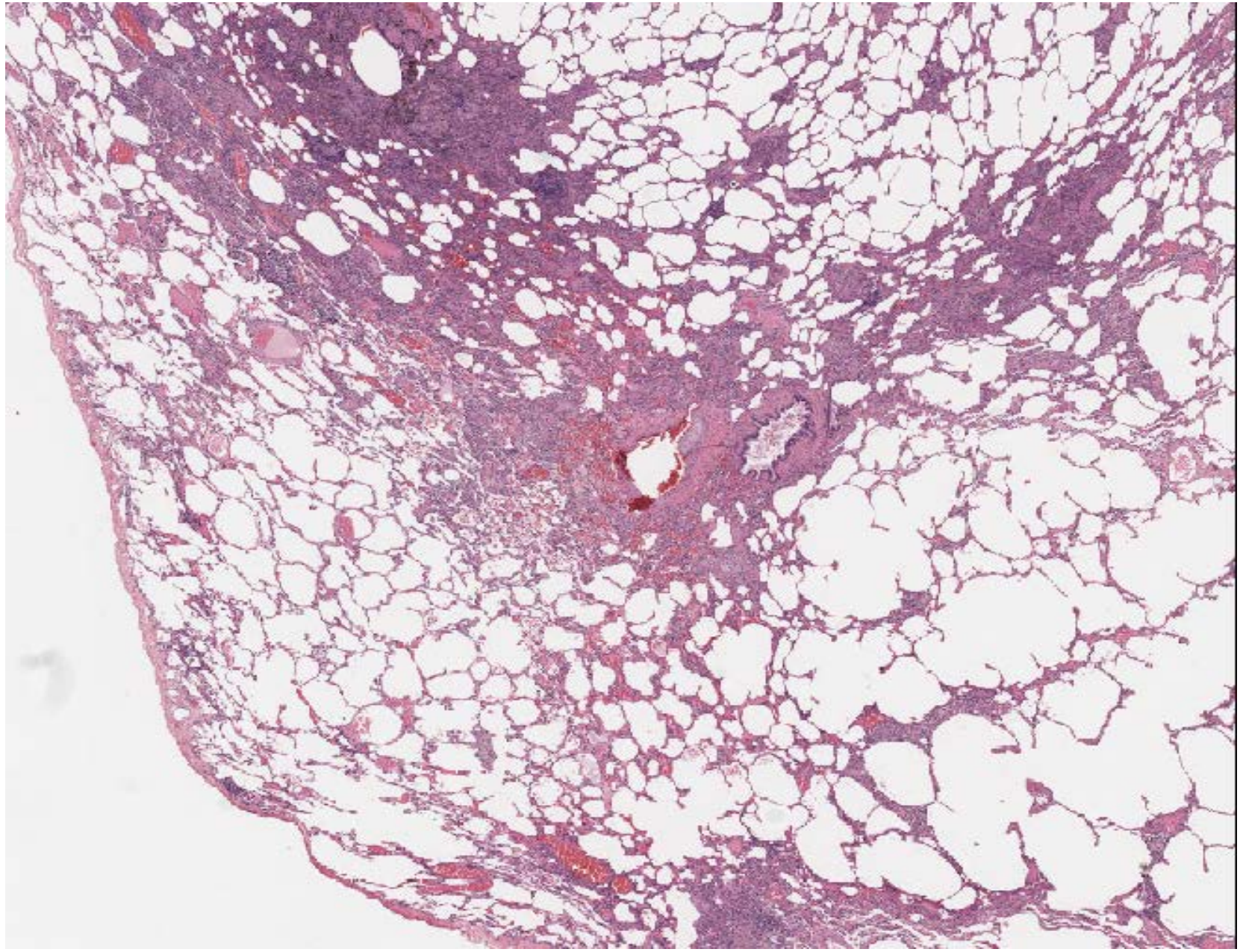


Bronchiectasis

Peribronchiolar inflammation/ granulation tissue (BOOP)



Hypersensitivity Pneumonitis



Abnormalities on HRCT that reflect small airways disease can be broadly categorized into indirect and direct signs:

❖ widespread scarring and obliteration of the bronchioles results in the indirect sign of patchy density differences of the lung parenchyma, representing areas of under-ventilated and under-perfused lung (the so-called mosaic attenuation pattern).

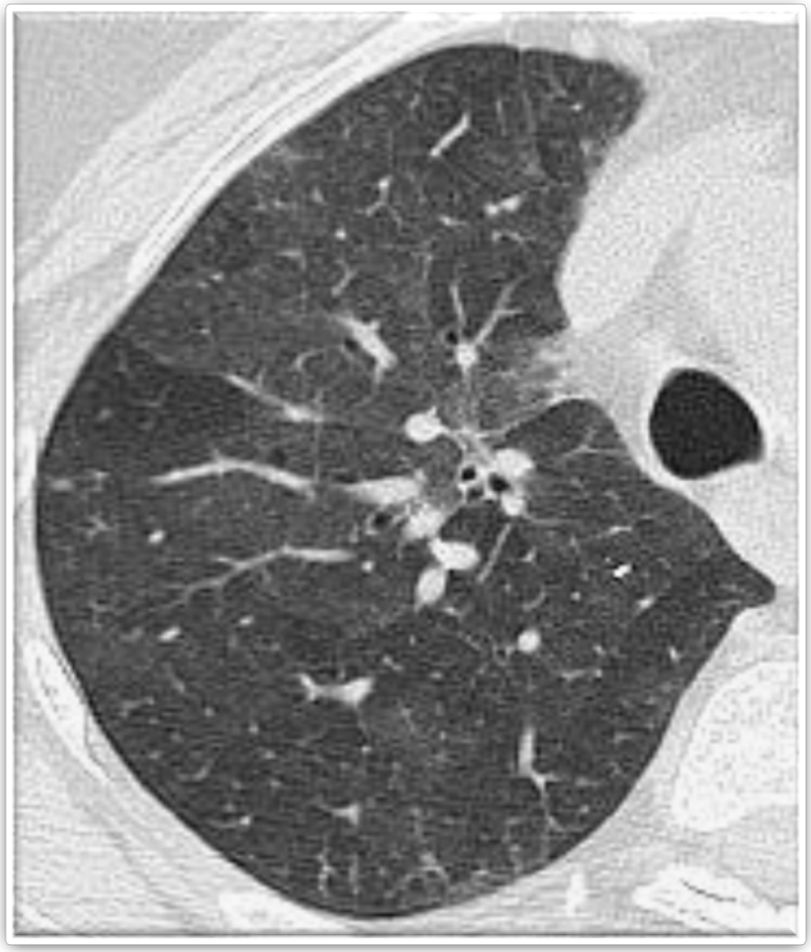
❖ by contrast, considerable thickening of the bronchiolar walls by inflammatory infiltrate and/or luminal and surrounding exudate render the affected small airways directly visible.

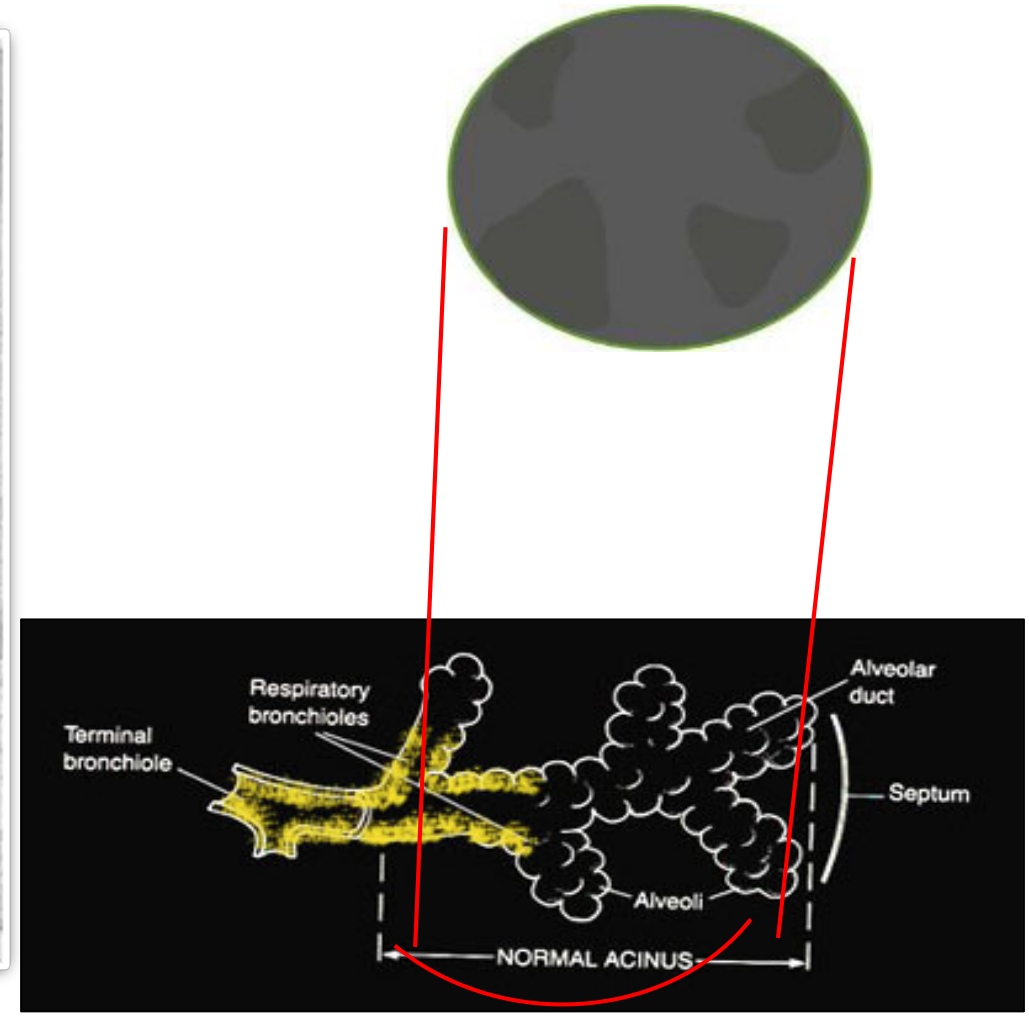
HR CT scan findings in bronchiolitis

- Indirect signs
  - Mosaic oligoemia
  - Expiratory air-trapping
- Direct signs
  - Centrilobular well defined nodules
  - “Tree in bud” pattern
  - Ground glass centrilobular nodules
- Mixed pattern
  - “Head-cheese” pattern

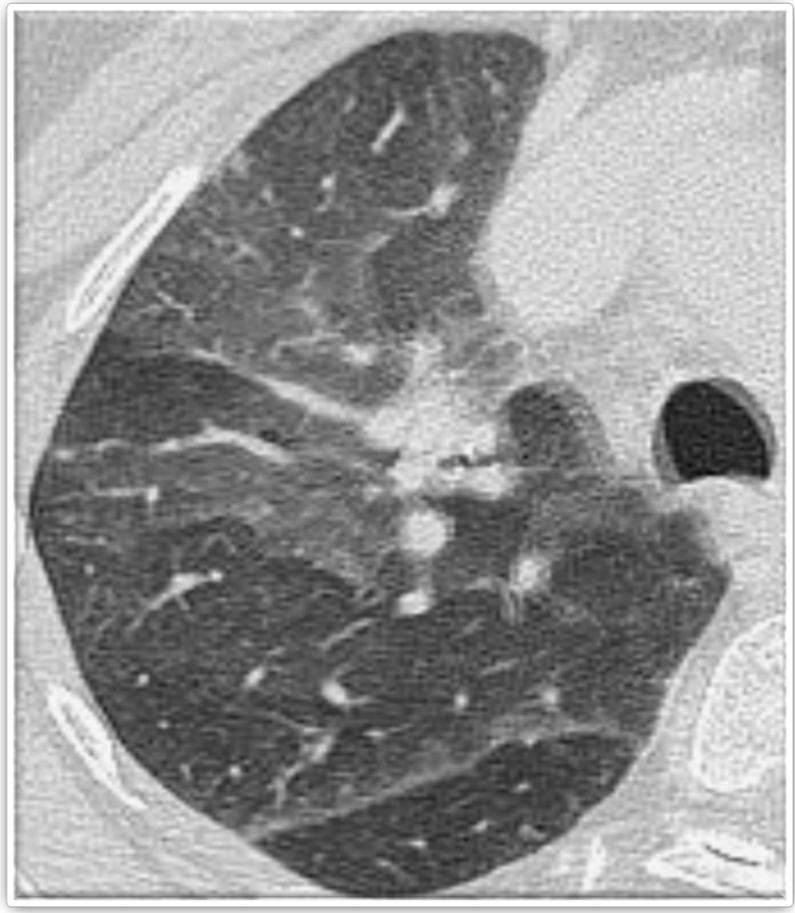
Indirect Signs

“mosaic oligoemia”



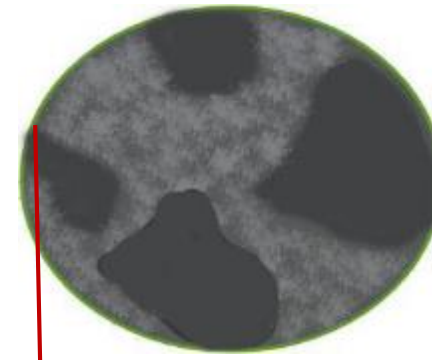


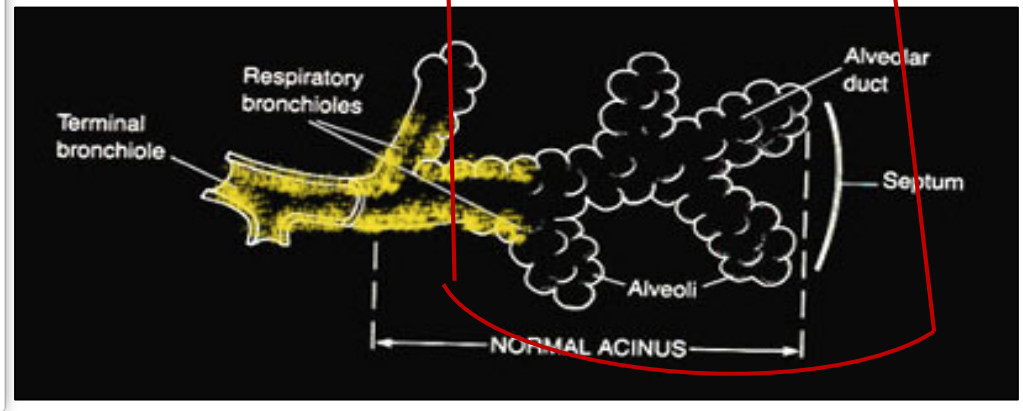
Indirect Signs

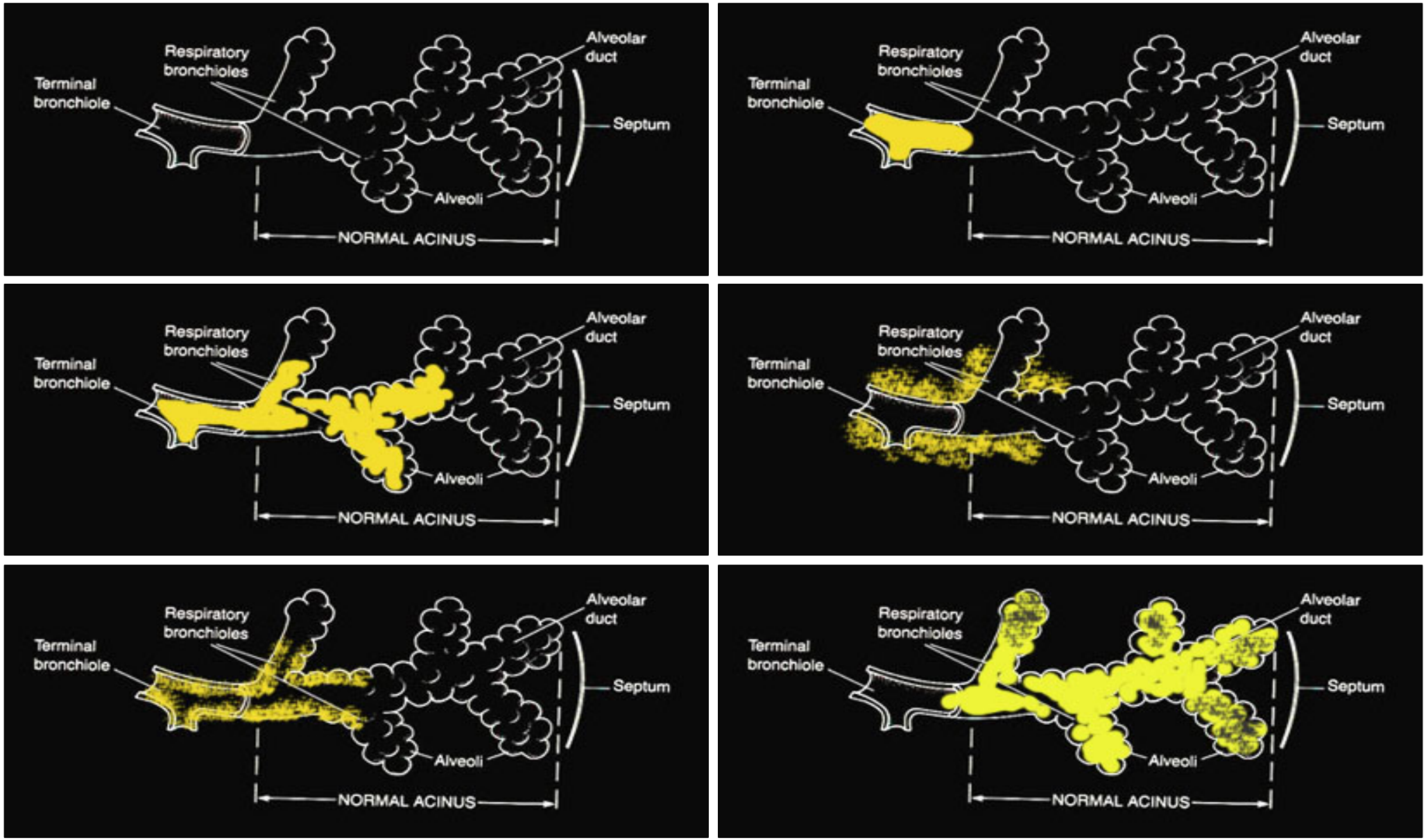


Expiratory CT

Air Trapping

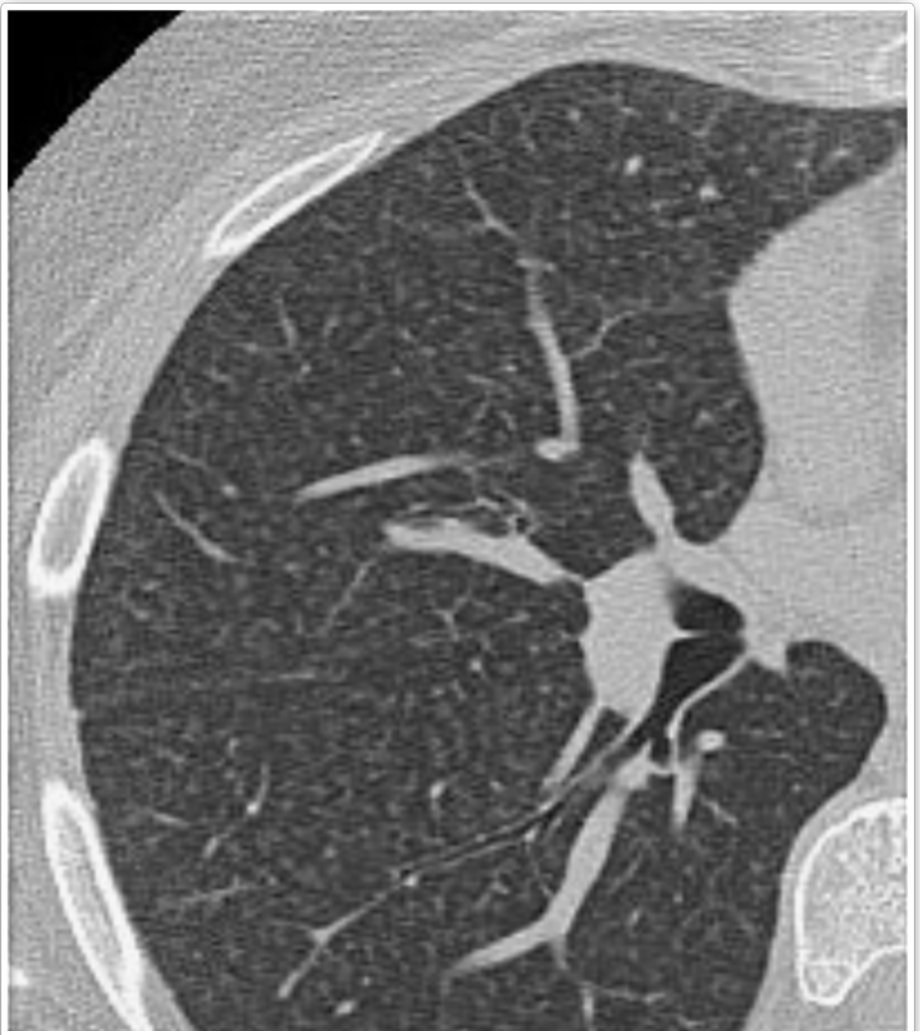






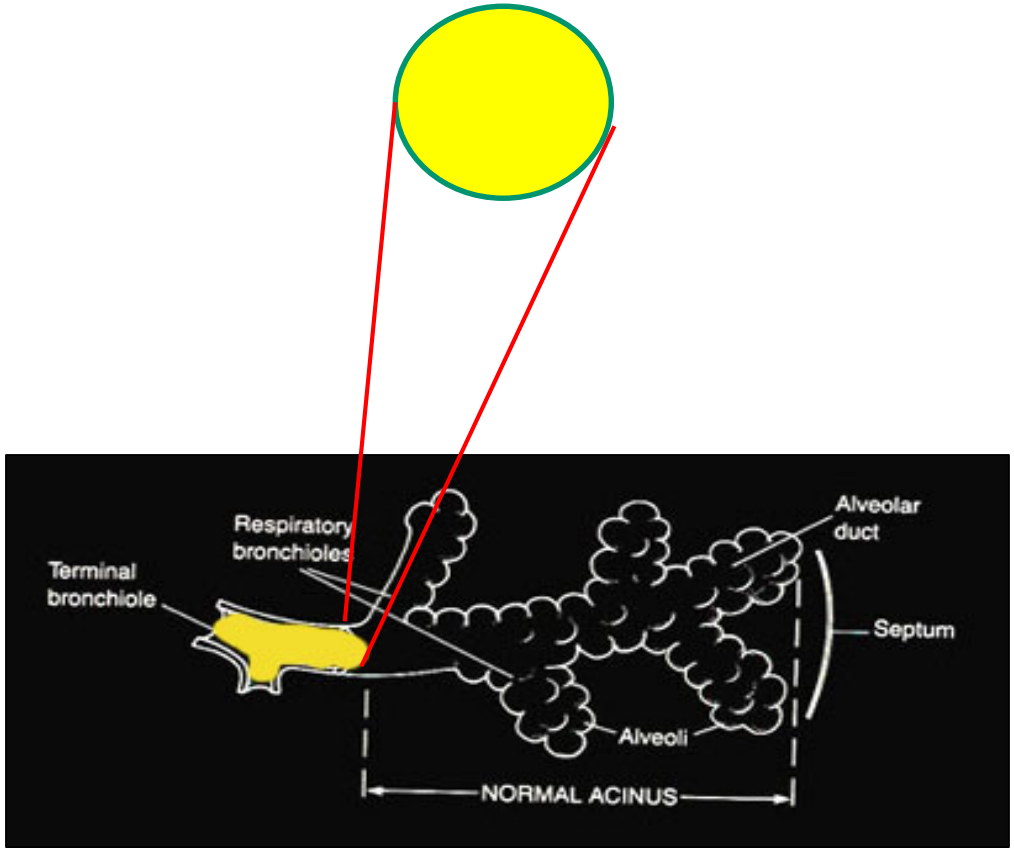
Direct signs

Direct Signs

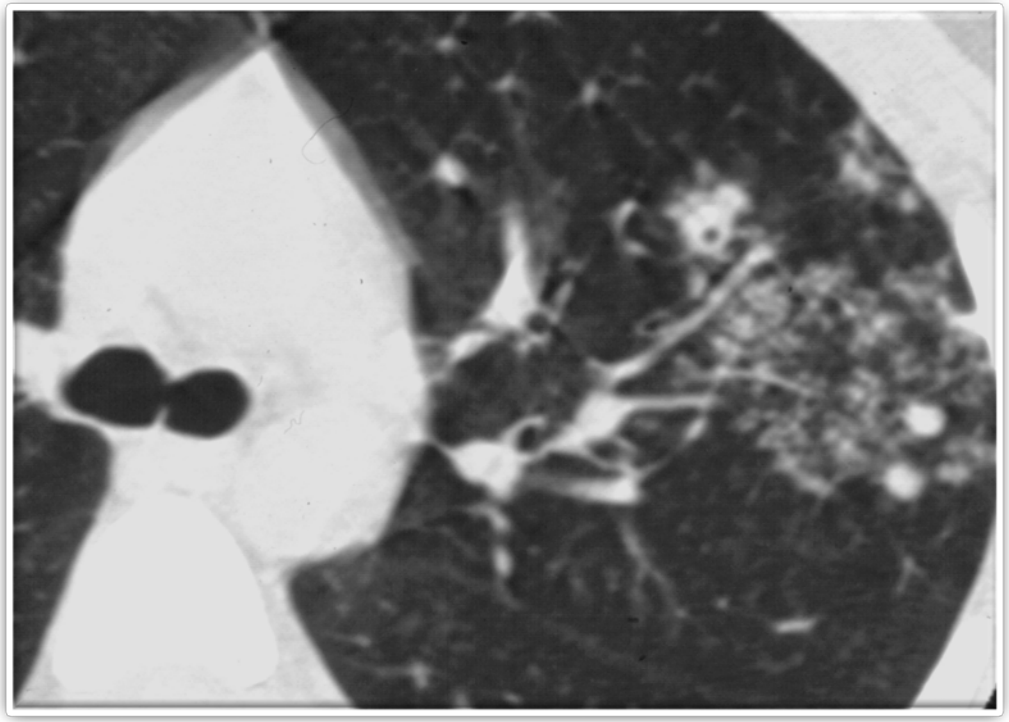


Lymphocytic (follicular) bronchiolitis

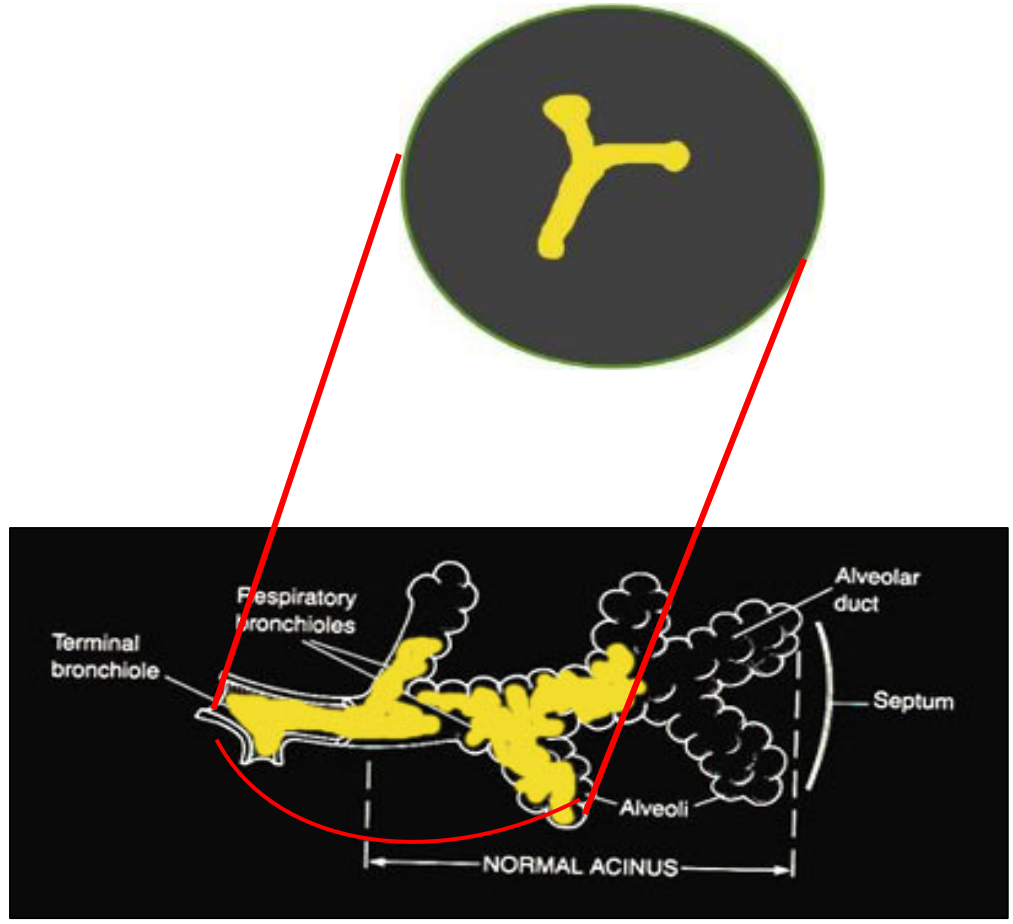
Centrilobular well defined micronodules



Direct Signs

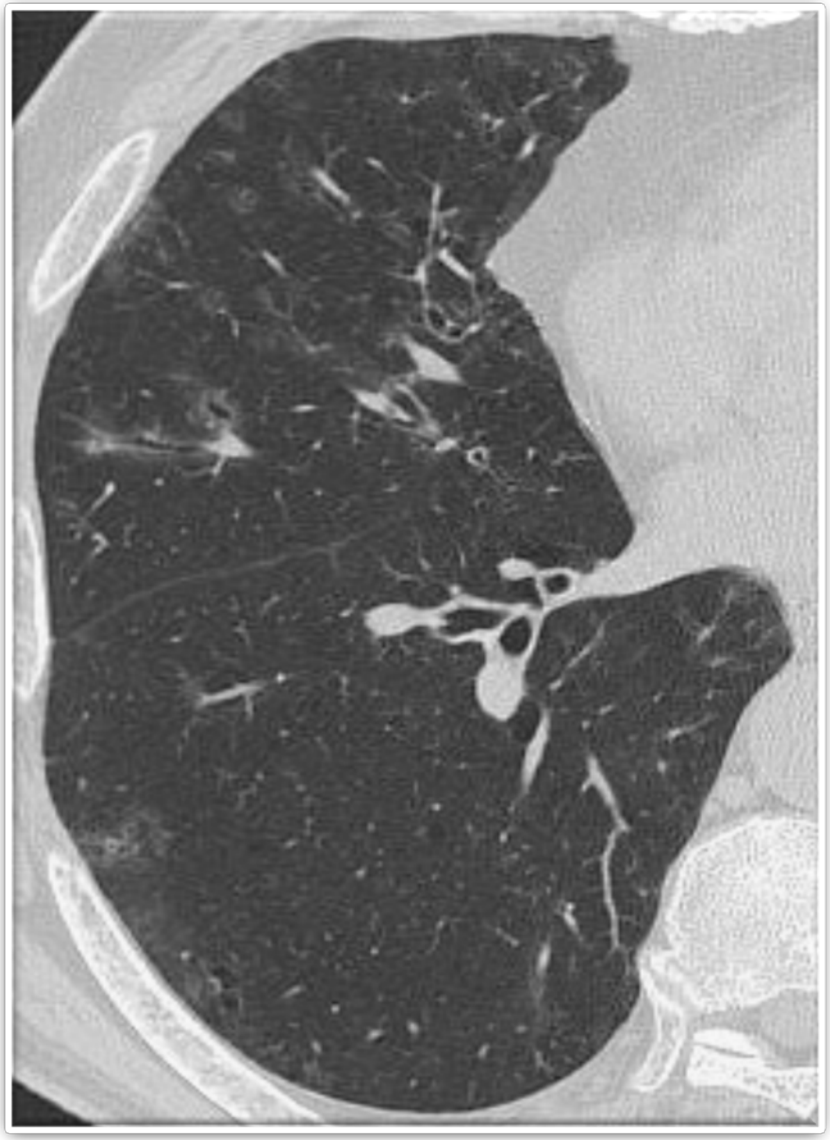


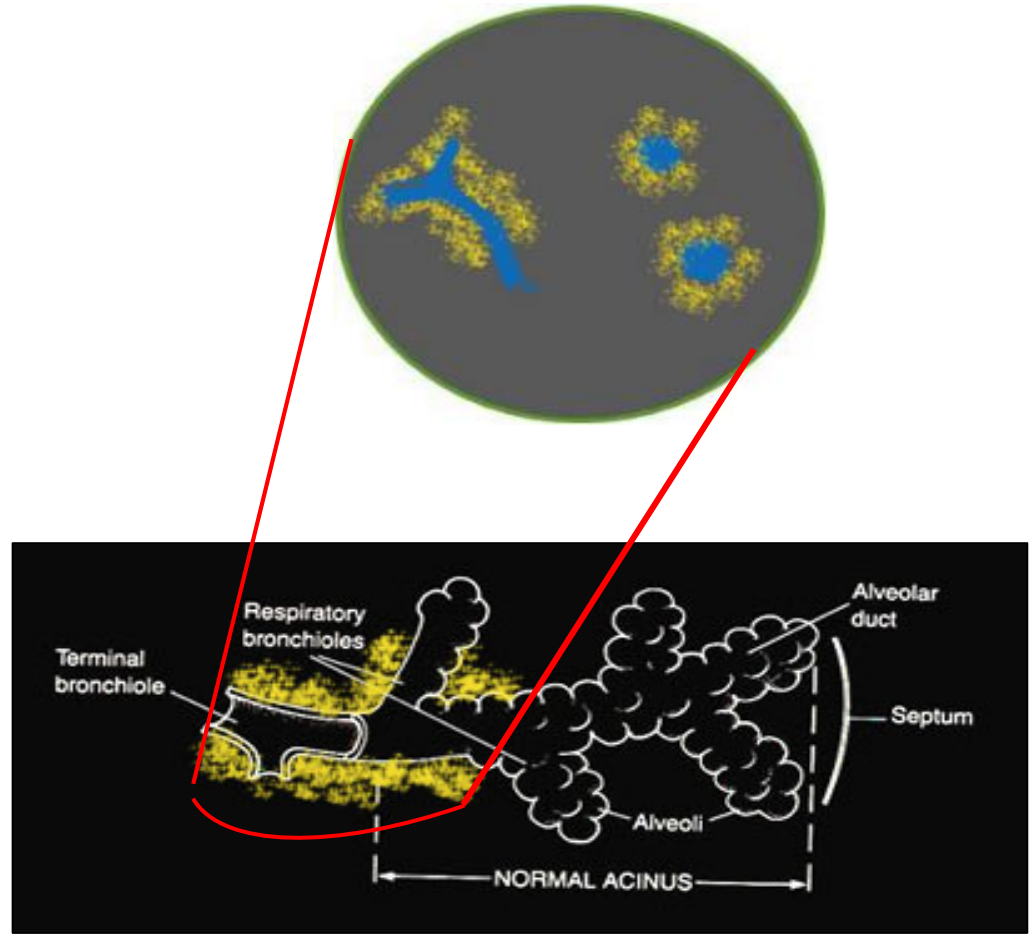
“tree in bud” pattern

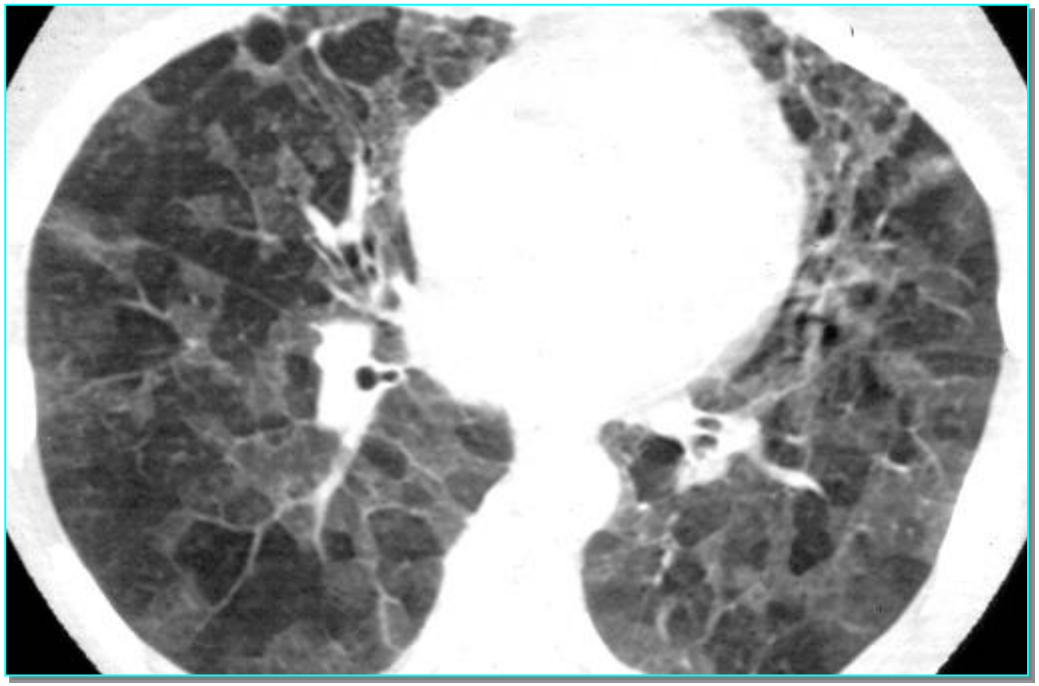


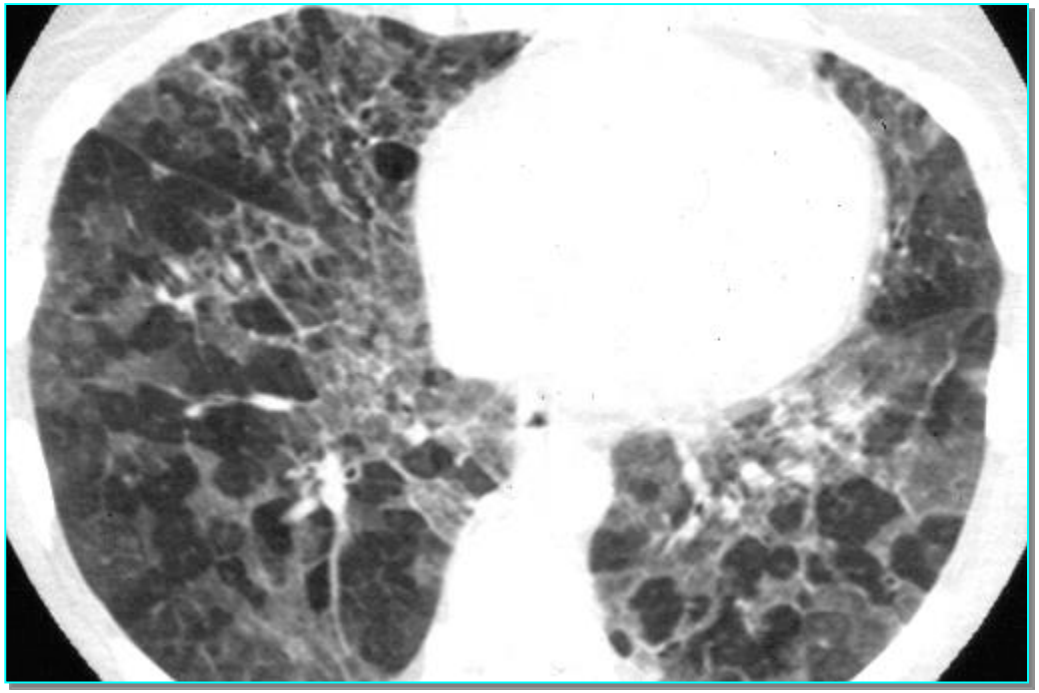
Direct Signs

Centrilobular ground glass nodules









“head cheese” pattern

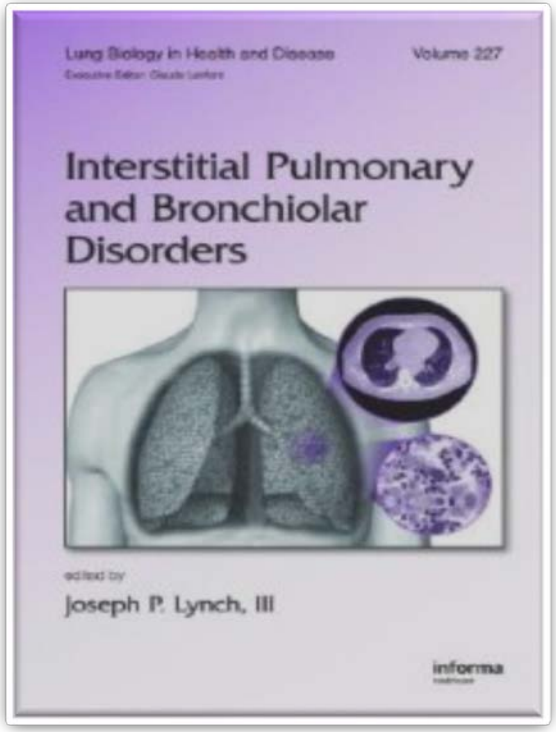


Table 3 Classification of HRCT Findings in Bronchiolar Diseases

CT features	Type of bronchiolitis	Structures mainly involved
Centrilobular nodules and branching lines (tree in bud)	Cellular bronchiolitis	Membranous and respiratory bronchioles
Centrilobular nodules (with ground-glass attenuation)	Cellular bronchiolitis Bronchiolitis with inflammatory polyps	Respiratory bronchioles Centrilobular airways
Low attenuation (mosaic perfusion) and expiratory air trapping	Cicatritial bronchiolitis Bronchiolitis with inflammatory polyps	Respiratory and membranous bronchioles Membranous bronchioles
Mixed pattern	Cellular bronchiolitis Bronchiolitis with inflammatory polyps, cicatricial bronchiolitis	Respiratory and membranous bronchioles

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MARCO CHILOSI
University of Verona, Verona, Italy

Clinical definition of bronchiolitis is still elusive.

- **Signs and symptoms are nonspecific and polymorphous.**

- The course is usually chronic but it may be acute or subacute.

- Pulmonary function tests show more frequently an obstructive impairment but in the early phases can be normal.

- Signs: inspiratory squeaks. Cough in the latest phase of forced expiration

- Specific laboratory markers for bronchiolitis are not yet identified.

Bronchioles: silent zone

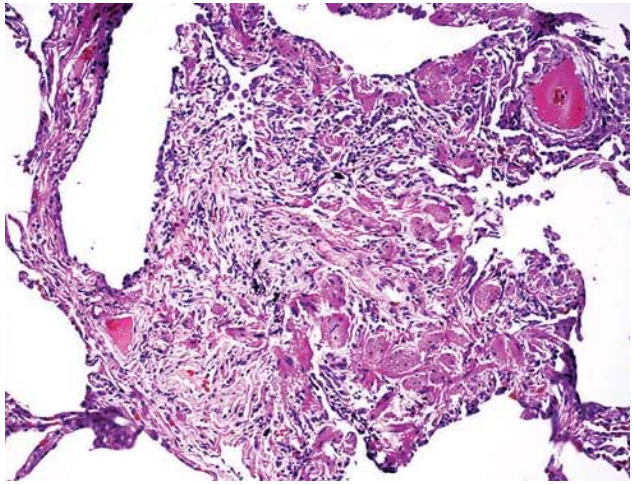
Clinical classification of bronchiolitis

- Inhalation bronchiolitis
  - *Toxic fume inhalation*
  - *Irritant gases and mineral dusts*
  - *Organic dusts*
- Infectious and postinfectious bronchiolitis
- Chronic aspiration
- Drug induced bronchiolitis
- Collagen-vascular disease-associated bronchiolitis
- Paraneoplastic pemphigus associated bronchiolitis
- Inflammatory bowel disease associated bronchiolitis
- Post-transplant bronchiolitis
- Neuroendocrine cell hyperplasia with bronchiolar fibrosis
- Diffuse panbronchiolitis
- Cryptogenic bronchiolitis
- Miscellanea
  - *Lysinuric protein intolerance*
  - *Ataxia-Telangiectasia*
  - *Familia form of immunodeficiency*
  - *IgA nephropathy*
  - *Associated to lichen planus*
  - *Stevens–Johnson syndrome*

“fume-related” bonchiolitis

- Toxic and irritant gases and fumes [nitrogen dioxide, sulfur dioxide, ammonia, chlorine, phosgene, butter flavorings (diacetyl) ……]
- Grain dusts
- Mineral dusts (talc, stearate of zinc powder, asbestos, iron oxide, aliminium oxide…)
- Organic dusts (EAA, ……)
- Free-base cocaine
- Incenerator fly ash
- Cigarette smoke
- Thionyl chloride

Am J Respir Crit Care Med 1999.159:2003-2008.



Clinical Pathology Workshop Summary

Nylon Flock–Associated Interstitial Lung Disease

WILLIAM L. ESCHENBACHER, KATHLEEN KREISS, M. DIANE LOUGHEED, GLENN S. PRANSKY, BRIAN DAY, and ROBERT M. CASTELLAN

OPEN ACCESS Freely available online

PLOS ONE

Increased Respiratory Disease Mortality at a Microwave Popcorn Production Facility with Worker Risk of Bronchiolitis Obliterans

Cara N. Halldin[1,2]*, Eva Suarthana[1,2], Kathleen B. Fedan[2], Yi-Chun Lo[1,3], George Turabelidze[3], Kathleen Kreiss[2]

The New England Journal of Medicine

CLINICAL BRONCHIOLITIS OBLITERANS IN WORKERS AT A MICROWAVE-POPCORN PLANT

KATHLEEN KREISS, M.D., AHMED GOMAA, M.D., SC.D., GREG KULLMAN, PH.D., KATHLEEN FEDAN, B.S., EDUARDO J. SIMOES, M.D., M.SC., M.P.H., AND PAUL L. ENRIGHT, M.D.

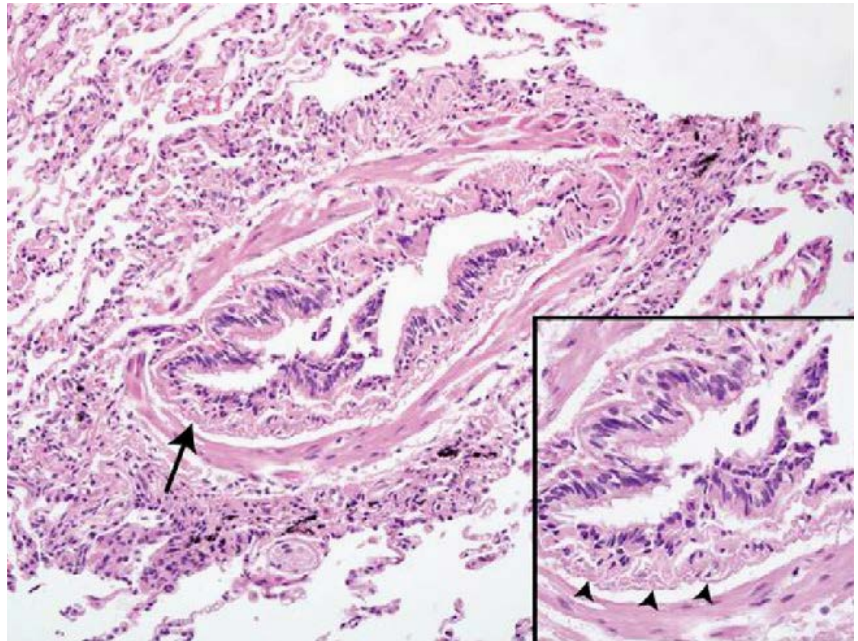
ratory Medicine (2008) 102, 825–830

ELSEVIER

respiratoryMEDICINE

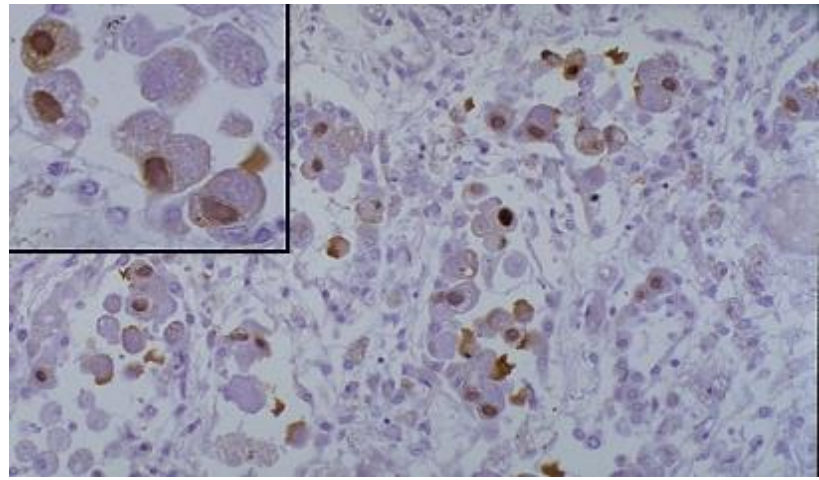
An International collaborative pathologic study of surgical lung biopsies from mustard gas-exposed patients

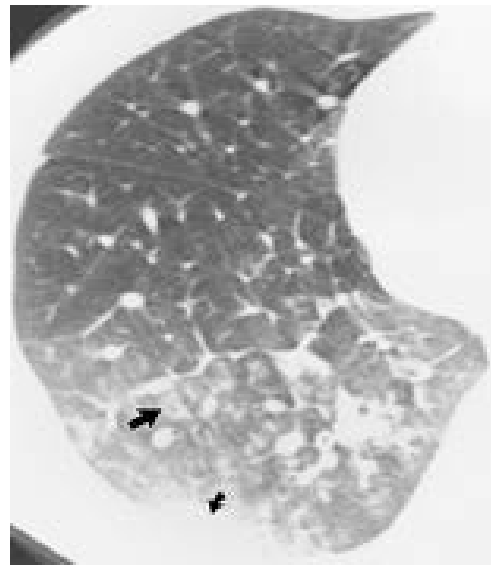
Mostafa Ghanei[a,*], Henry D. Tazelaar[b], Marco Chilosi[c], Ali Amini Harandi[a], Mohammadreza Peyman[a], Hassan Mohammad Hosseini Akbari[a], Hassan Shamsaei[a], Moslem Bahadori[d], Jafar Aslani[a], Azam Mohammadi[e]



Infectious and post-infectious bronchiolitis in adults

Cases due to *Adenovirus (*serotypes 3, 7 and 21), *HHV*, *RSV*, *CMV,* ***Mycoplasma pneumoniae*** *,* ***Mycobacteria****, Bordetella pertussis, influenza* have been described.
Uncommon causes of infectious bronchiolitis are: *Legionella pneumophila, Haemophilus influenzae, Klebsiella pneumoniae, Serratia marcescens, Aspergillus or Mucor, Nocardia* , Rubeola, Measles, *Enteroviruses*, HIV, Malaria, *Cryptosporidium* species, Microsporidia (*Encephalitozoon hellem*)





Diagnosis: HRCT, Serology, BAL, Microbiological investigations, ...Biopsy

Swyer–James or McLeod syndrome

- Swyer–James syndrome results from viral injury to the lung (before the age of 8 years)
- Unilateral transradiancy on plain chest radiography in S
syndrome reflects a combination of hypoplasia of the pulmonary vasculature and obliterative bronchiolitis
- The affected lung is small or normal in volume

<u>Diffuse bronchiolar disease due to chronic occult aspiration.</u>
Mayo Clin Proc. 2006 , 81:172-6.
Mayo Clin Proc 2018, 93:752-762

*Mean age 50 years (age range, 41-59 years)
*M/ 1:1
*Persistent dyspnea, cough, and lung infiltrates.
*History of gastroesophageal reflux
*HRCT: bronchial wall thickening/centrilobular nodules/tree in bud opacities
*Lung biopsy: bronchiolocentric organizing pneumonia with giant cells that contained material consistent with food

Drug induced bronchiolitis

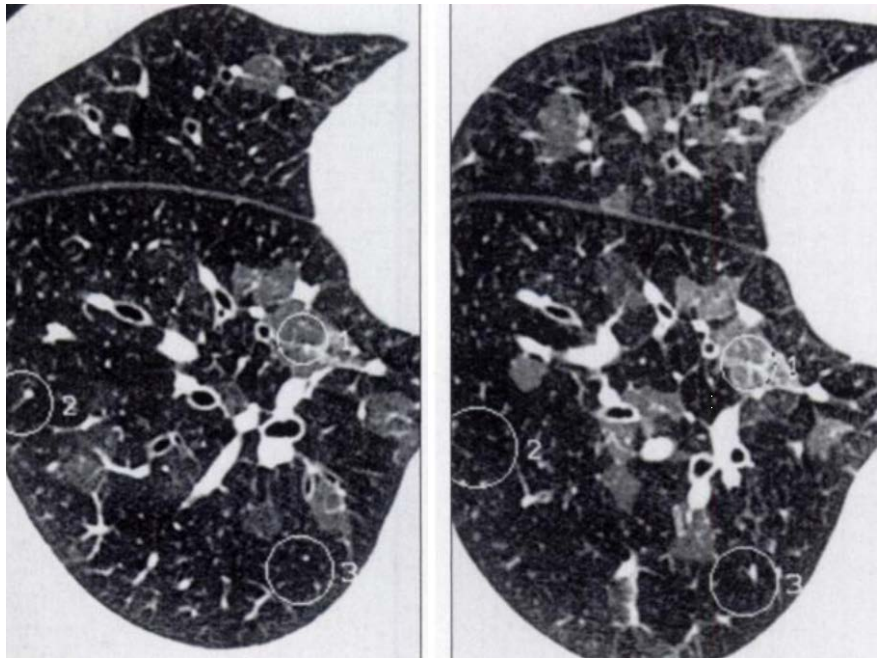
Drugs related bronchiolar damage more frequently presents with a clinical-radiological pattern and pathologic findings of BOOP.

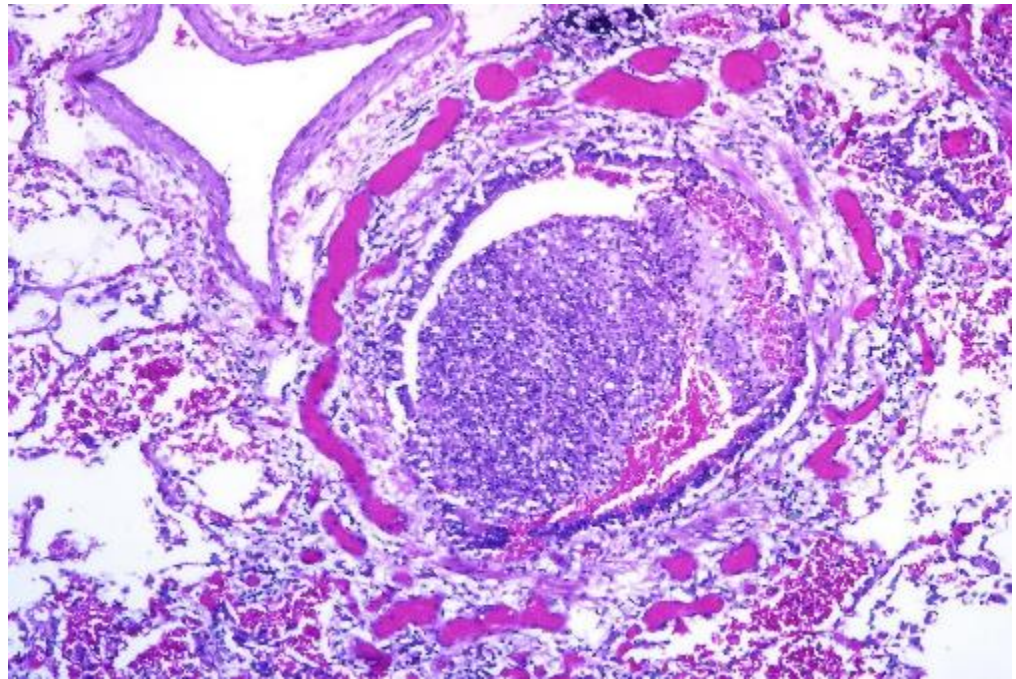
obstruction than did type 1. Scores for quantitative attenuation generated by compu
ware were helpful in assessing air-trapping and correlating it with pulmonary functio
findings may apply to patients with bronchiolitis obliterans from other causes.

AJR 1997

Bronchiolitis obliterans (also known as constrictive bronchiolitis) is a rare disease of respiratory bronchioles characterized by submucosal and peribronchiolar fibrosis [1, 2]. Because patients with

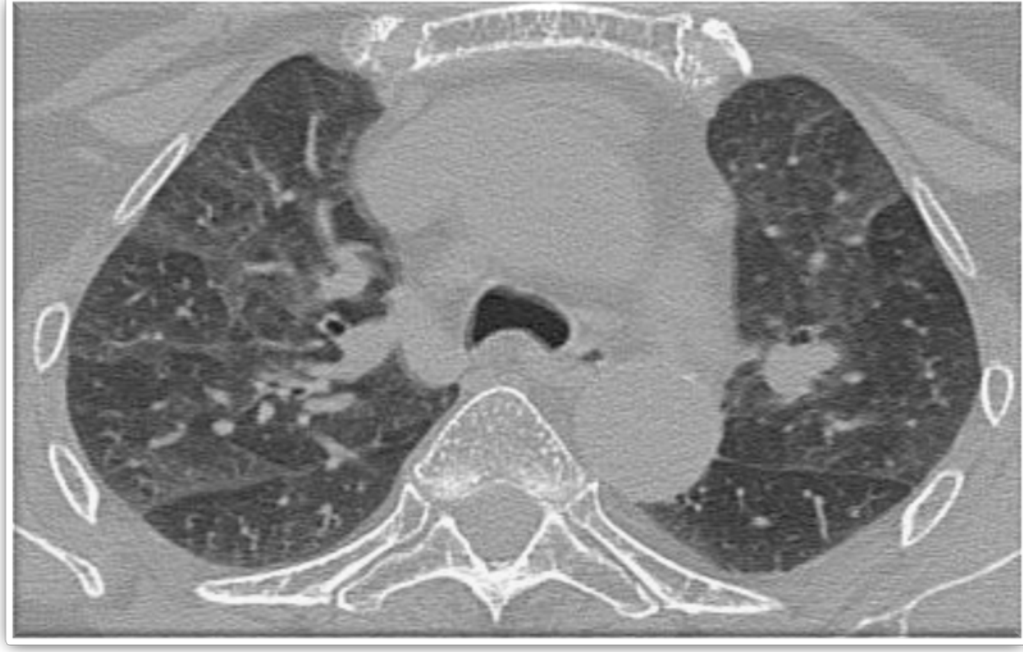
lution CT scans (i.e., diffuse bronchiec
air-trapping [mosaic attenuation]) are
regardless of the cause of disease [4
Although the relationship between high
tion CT abnormalities and pulmonary





Drug induced bronchiolitis (case reports –short series)

- D-Penicillamine
- Gold
- Tiopronin
- Busulfan
- Carmustin
- Lomustin
- Topotecan
- Imatinib
- Immune check point inhibitors



Iatrogenic pulmonary lesions

Anja C. Roden[a,*], Philippe Camus[b,c,d]

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[b] Service de Pneumologie et Soins Intensifs Respiratoires, Hopital du Bocage Centre Hospitalier Universitaire (CHU) de Bourgogne, Dijon, France
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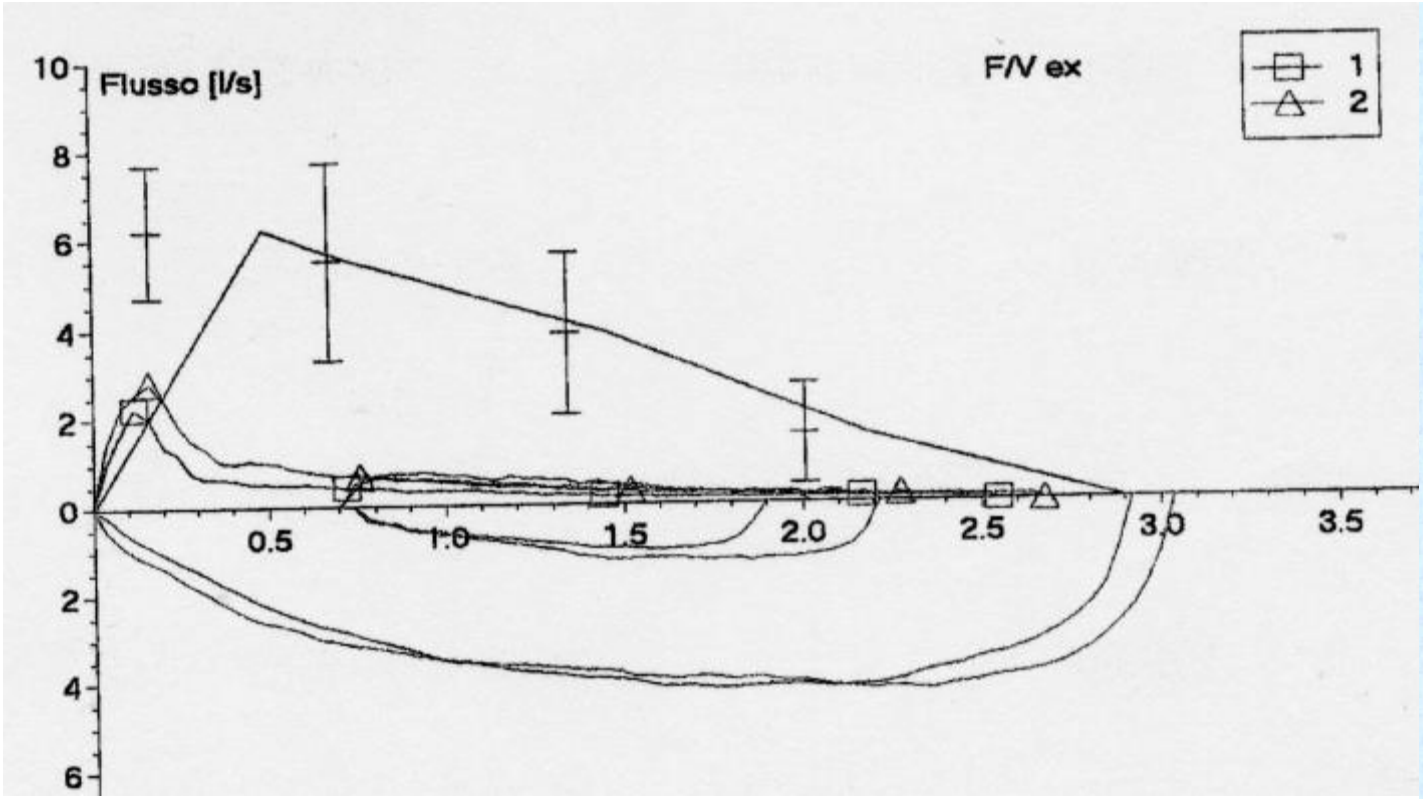
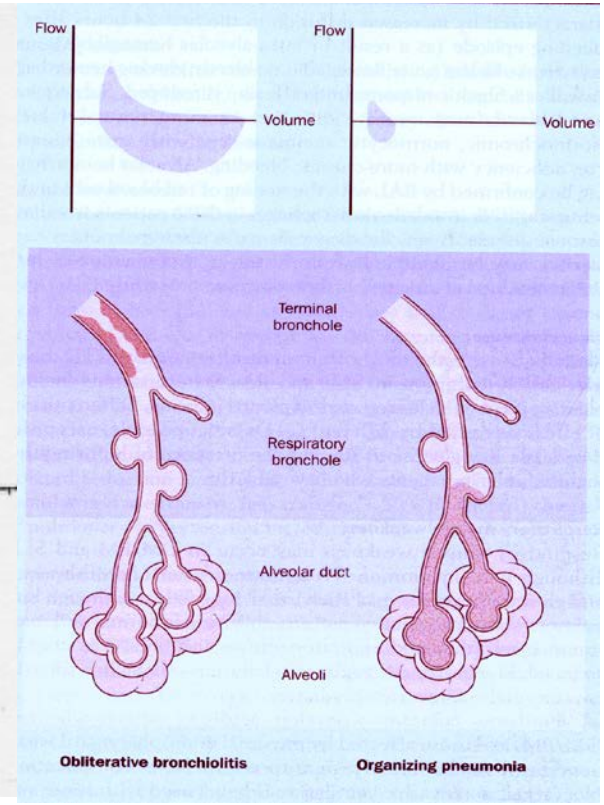
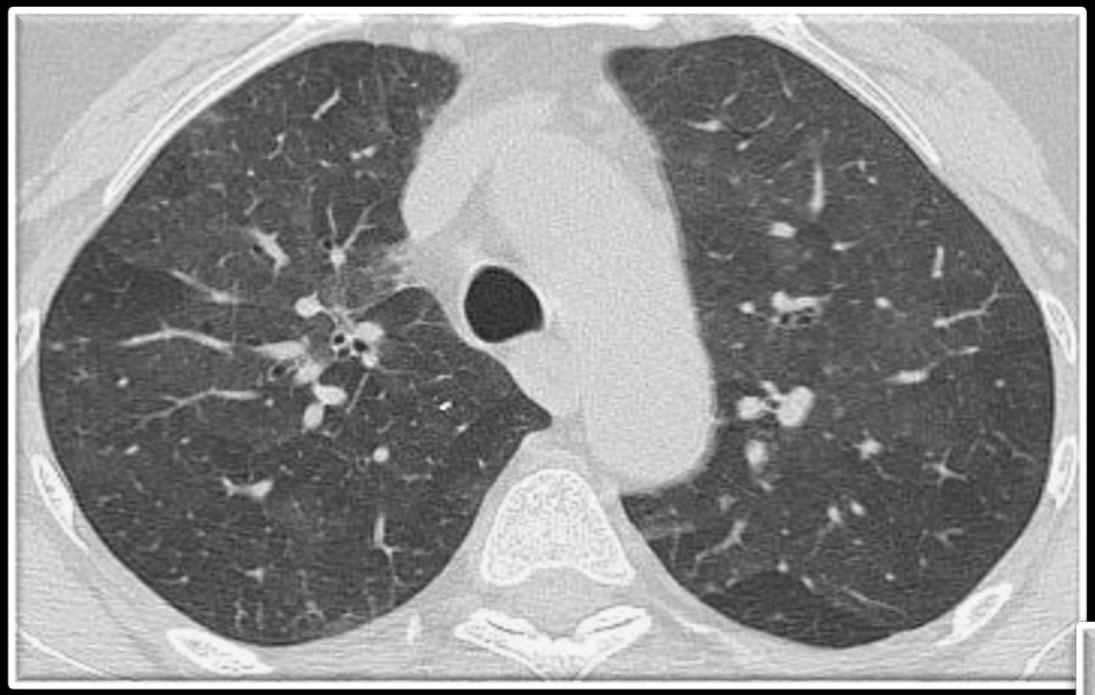
Sem Diagn Pathol 2018

Collagen-vascular disease and bronchiolitis

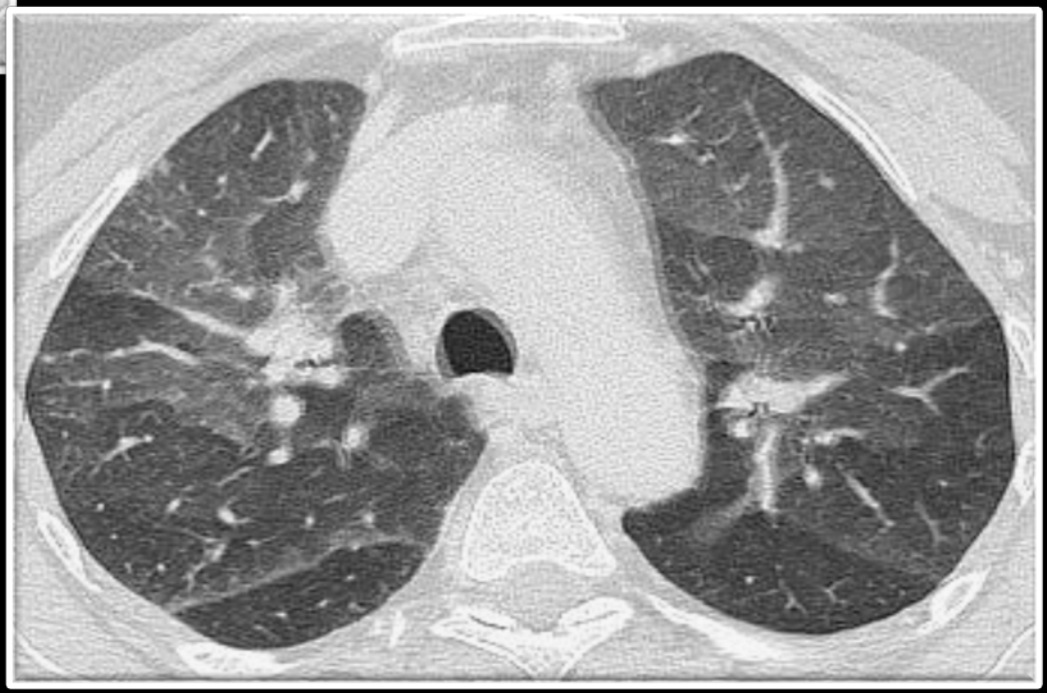
Rarely dyspnea and cough often associated with inspiratory rales and mid-inspiratory squeaks are observed in middle-aged women with seropositive rheumatoid arthritis (or less frequently in patients with juvenile rheumathoid arthritis, SLE, Scleroderma, Bechet's disease) and/or evidence of advanced autoimmune exocrinopathy (Sjogren's syndrome)



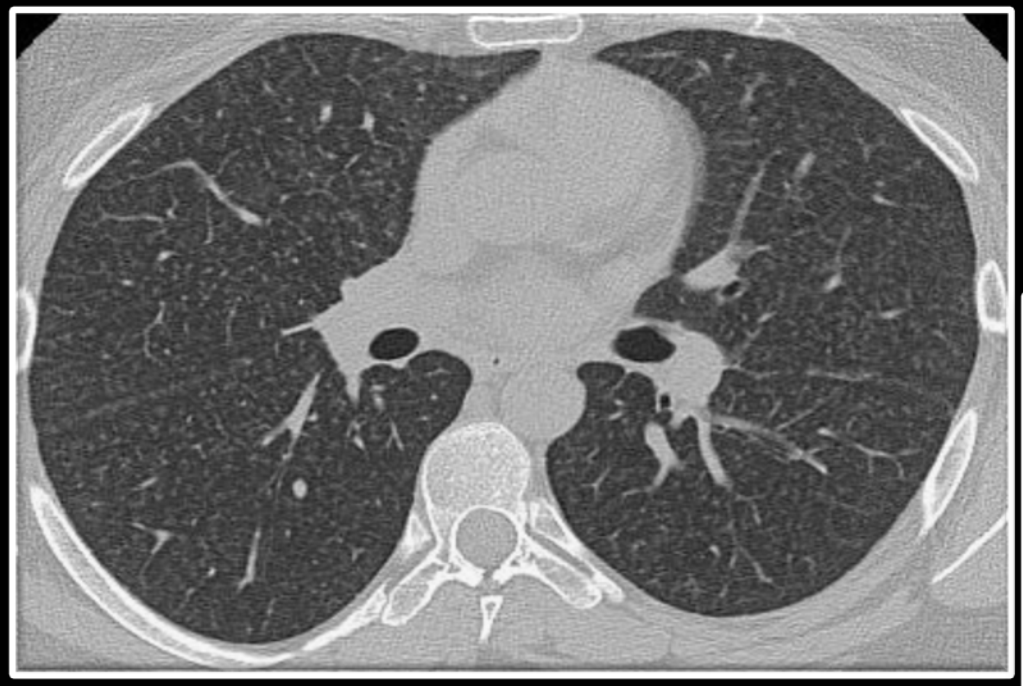


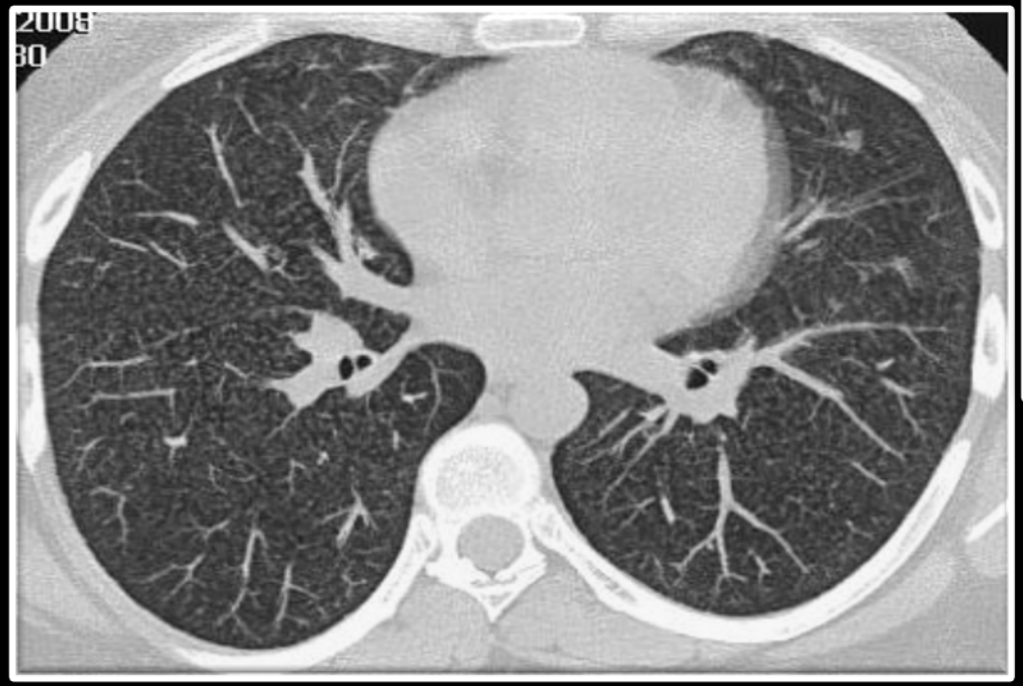


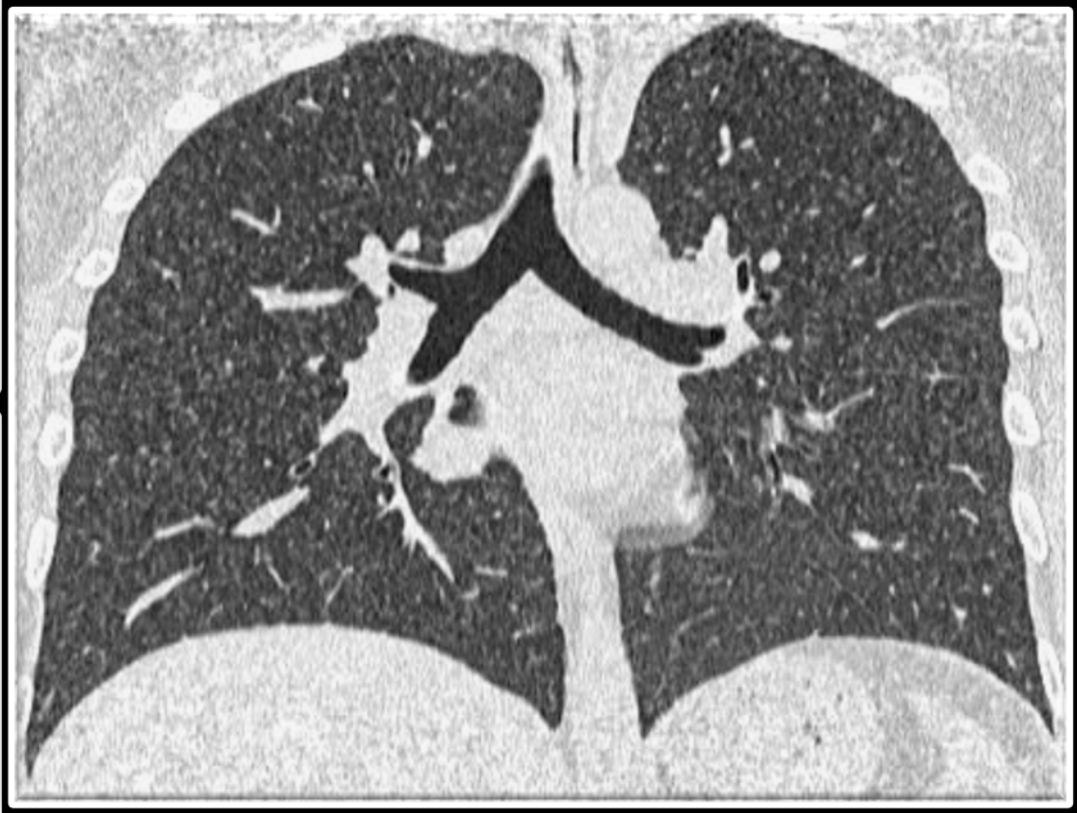
BRONCHIOLITIS OBLITERANS
AND REUMATOID ARTRITIS



Sjogren syndrome

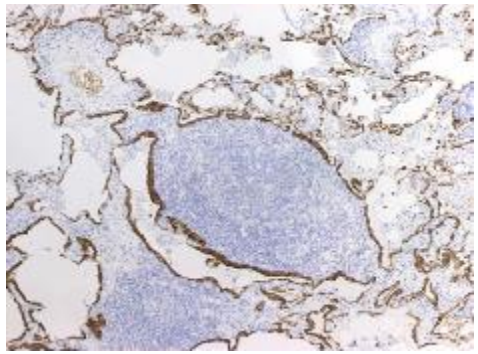


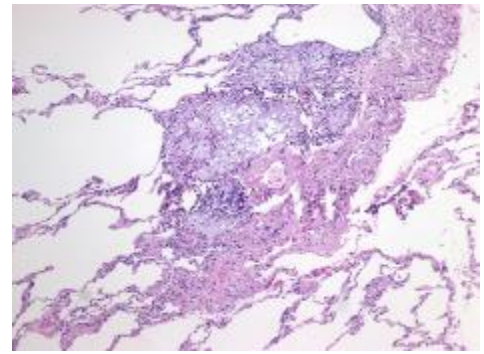




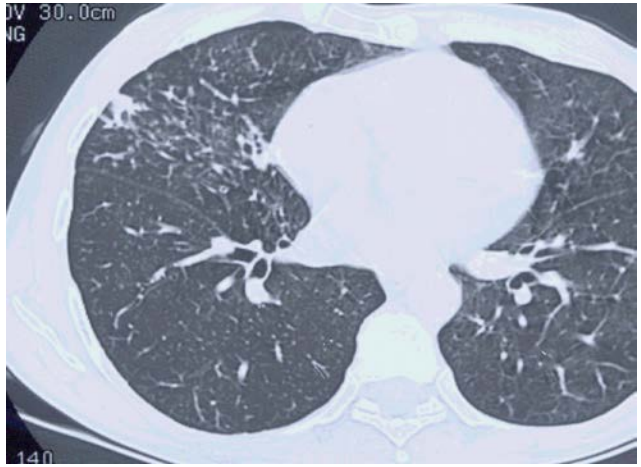
Collagen-vascular disease and bronchiolitis

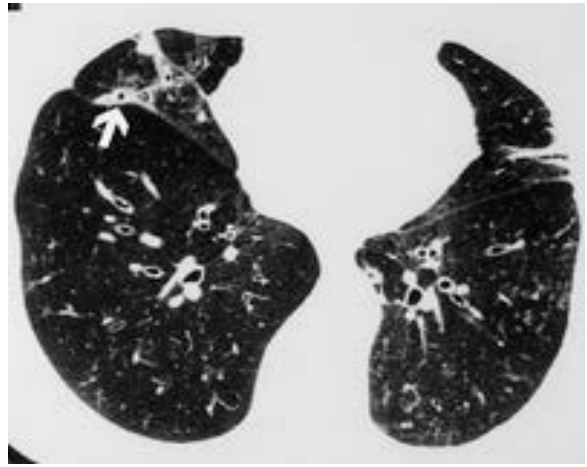
Histology: cellular/follicular bronchiolitis; cicatritial bronchiolitis/DPB pattern

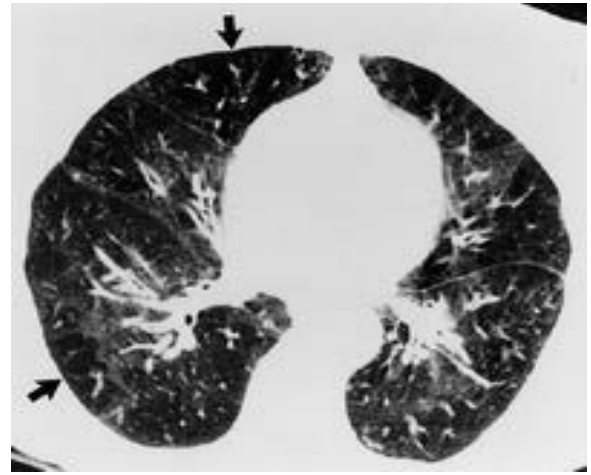




HRCT shows bilateral patchy areas of low attenuation or centrilobular nodules and branching lines. Bronchiectasis can also be documented







Constrictive bronchiolitis associated with paraneoplastic autoimmune multi-organ syndrome

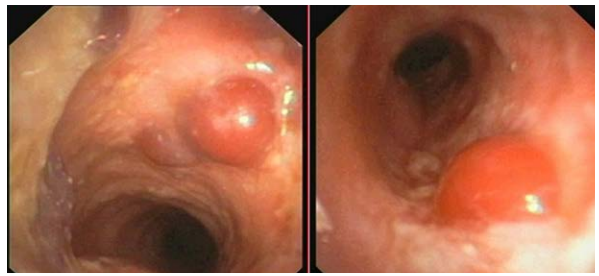
FABIEN MALDONADO,[1] MARK R. PITTELKOW[2] AND JAY H. RYU[1]

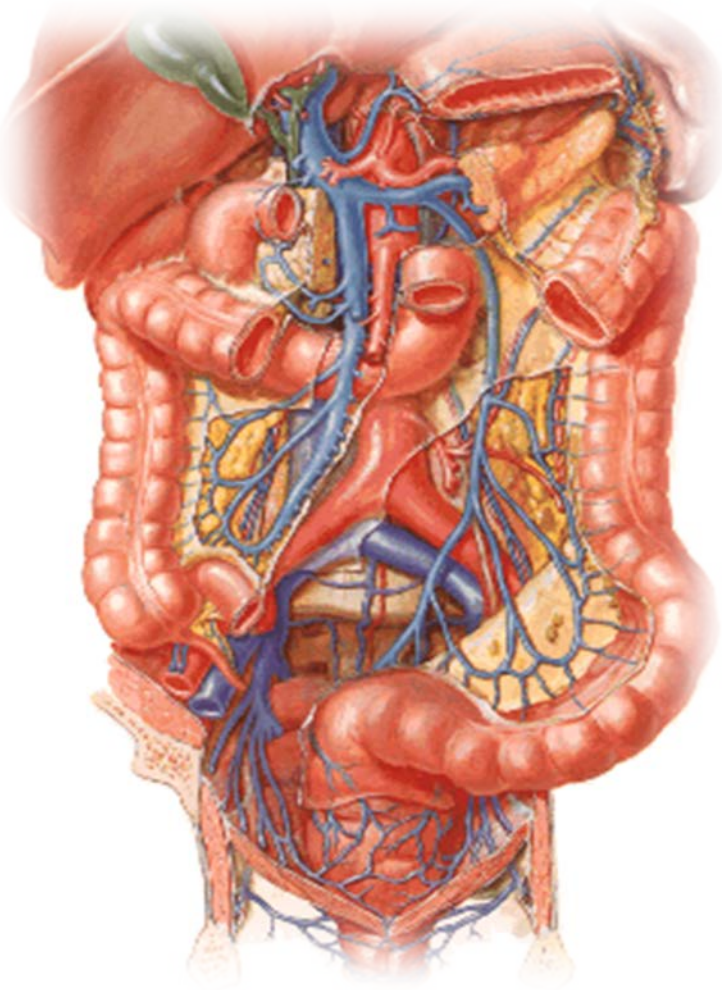
Respirology 2008

Table 2 Three patients with PAMS-associated constrictive bronchiolitis

Case no.	Age (years), gender	Smoking history	Underlying neoplasm	Respiratory symptoms	Chest CT	Pulmonary function	Outcome[†]
1	33, female	No	Castleman's disease	Dyspnoea	Diffuse air-trapping, minimal hazy infiltrates	Very severe obstruction	Died from respiratory failure at 18 months
2	56, male	No	T-cell lymphoma	Dyspnoea, productive cough	Bilateral bronchiectasis, diffuse air trapping	Very severe obstruction	Died from pneumonia and sepsis at 13 months
3	56, male	Past	Chronic lymphocytic leukaemia	Dyspnoea	Diffuse air trapping, bronchiectasis in the right lower lobe and mediastinal and hilar lymphadenopathy	Severe obstruction	Alive at 16 months

[†] Time interval for outcome is from the date of diagnosis for paraneoplastic autoimmune multi-organ syndrome.
NA, not available.

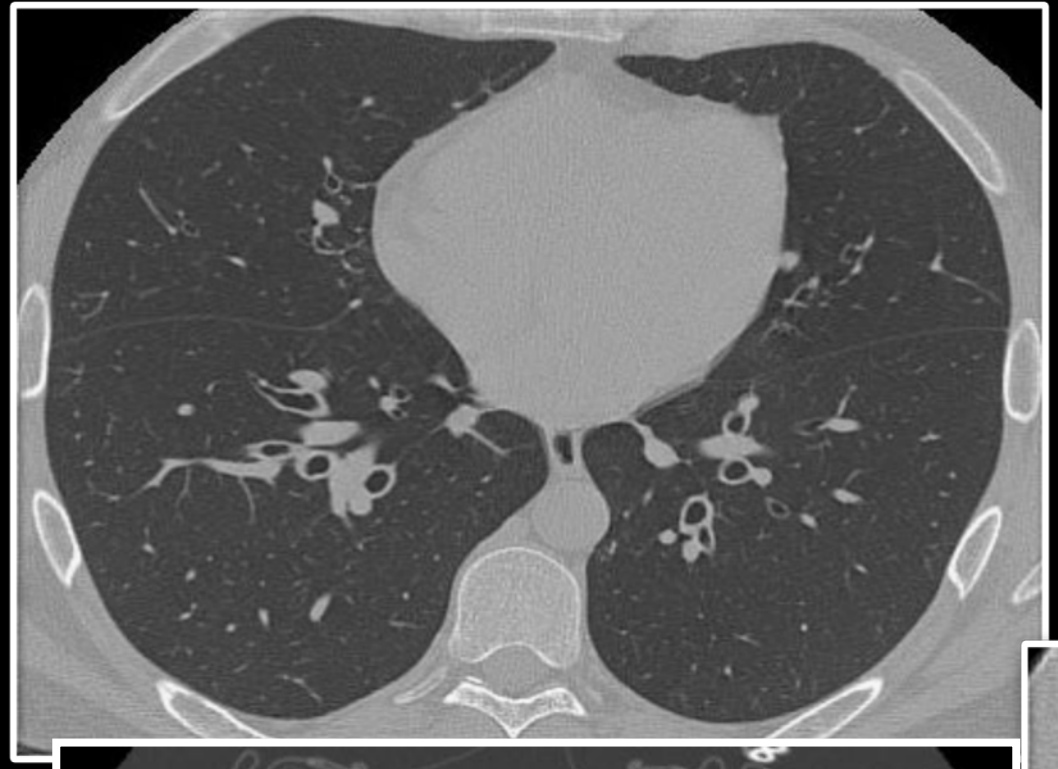


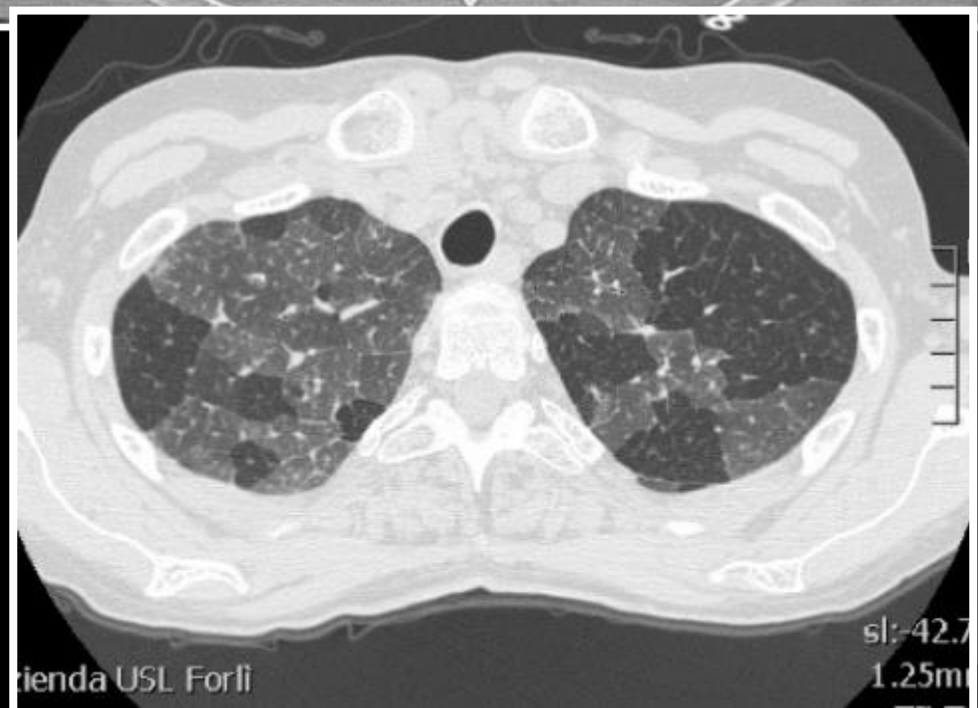


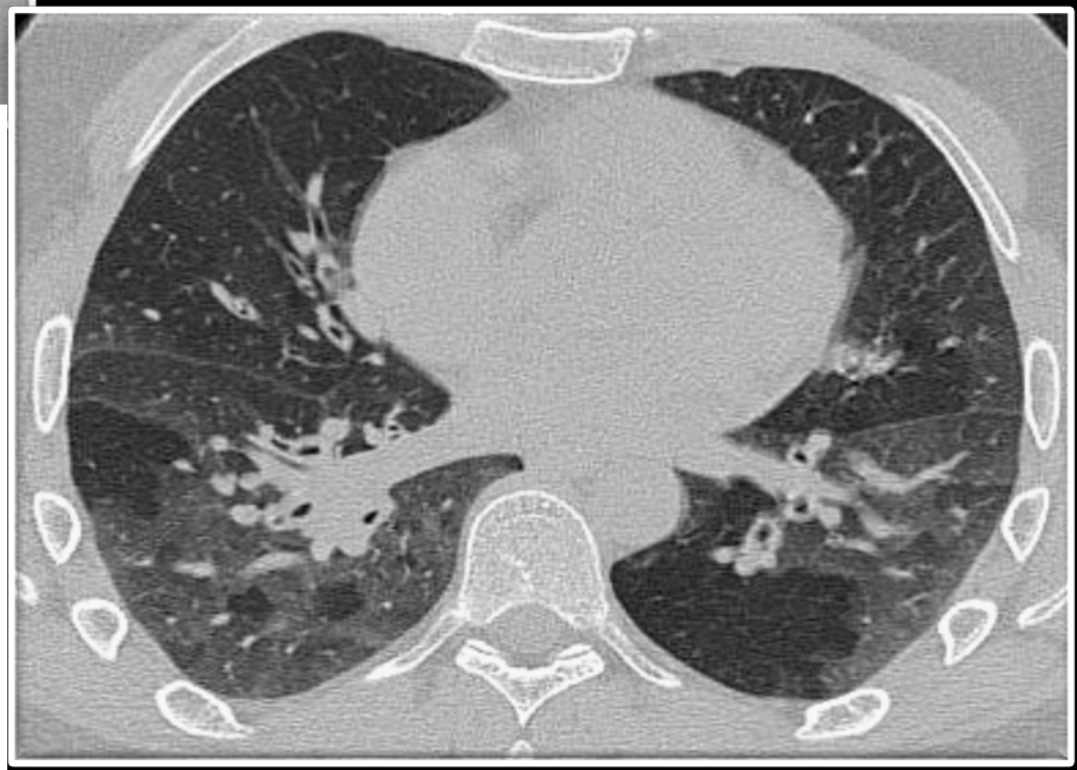
Pulmonary complications occur in an estimated 0.21% of patients with **IBD**, ulcerative colitis being most often associated with lung problems.

The most common presentation is large airway disease, such as tracheobronchitis, chronic bronchitis, or bronchiectasis. Bronchiolitis is extremely rare.

Cellular bronchiolitis with intraluminal accumulation of neutrophils and chronic inflammation in the wall, cicatricial bronchiolitis, and epithelial ulceration, aspects similar to that described in diffuse panbronchiolitis, have been reported in patients with ulcerative colitis.







Male, 34 y/0,
Ulcerative Colitis
Dyspnea

Post-transplant bronchiolitis obliterans syndrome (BOS)

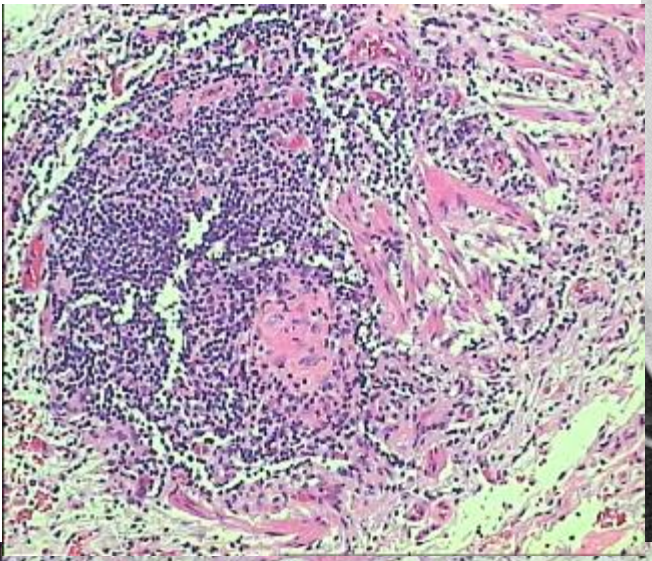
- Allogeneic bone marrow transplant (<10%)
- Lung transplant (50-80% at 5 years)

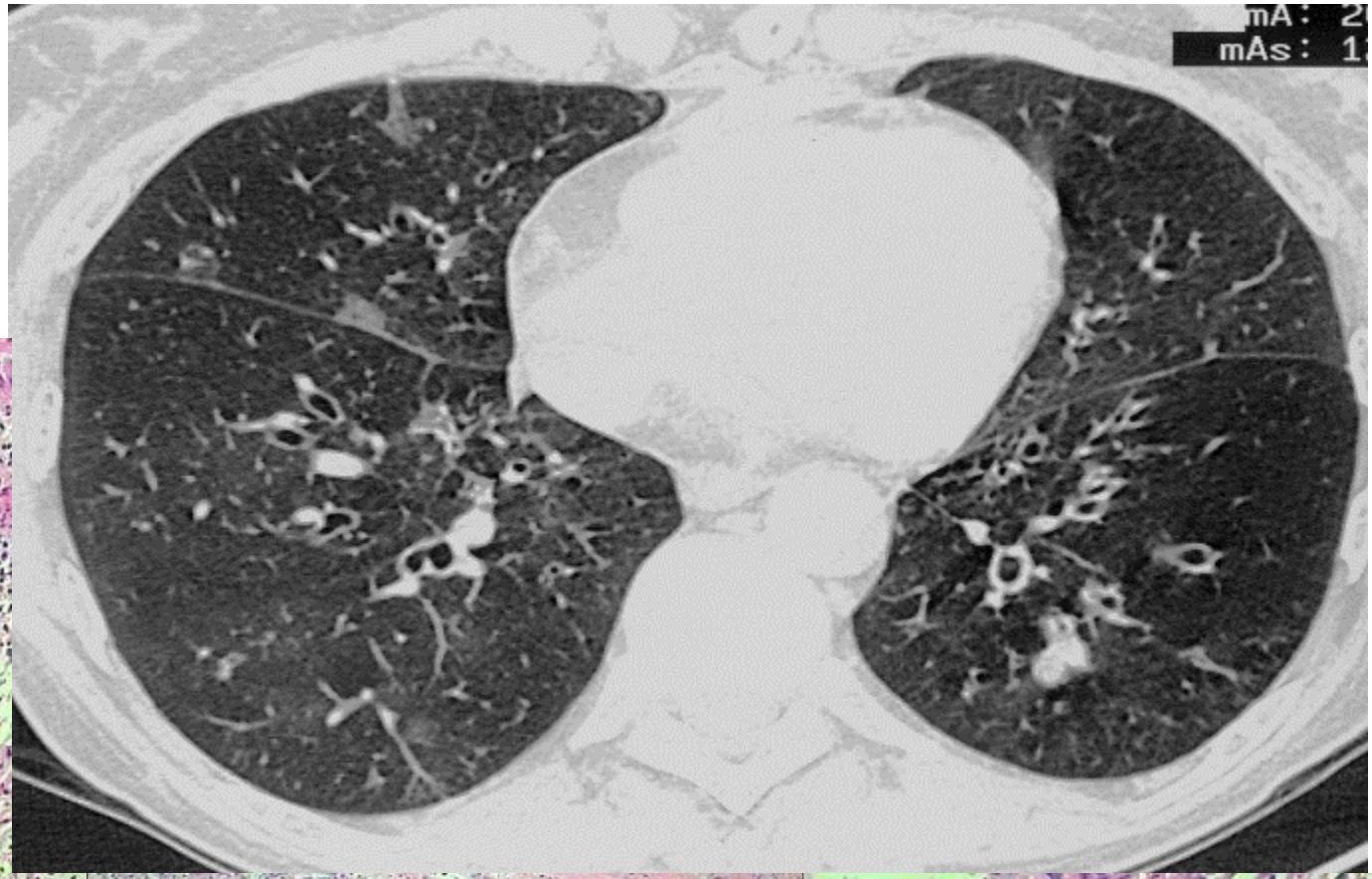
TABLE 3 Grading (staging) of bronchiolitis obliterans syndrome (BOS)[#]

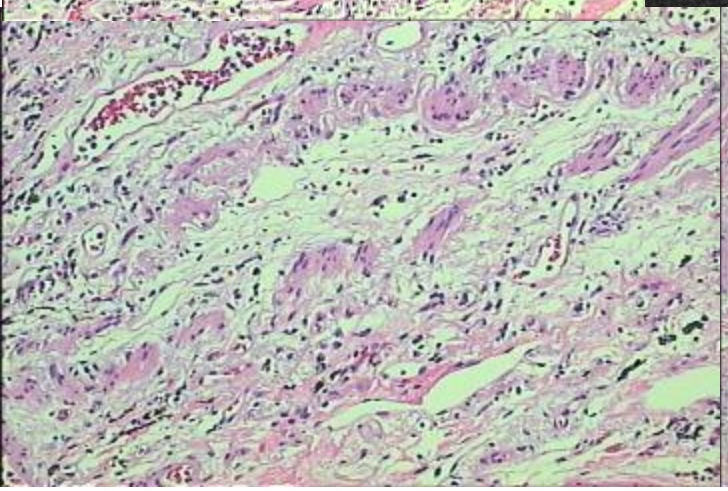
BOS Grade	Spirometry % of baseline[¶]	
	1993 Classification	2002 Classification
0	$FEV_1 \geqslant 80\%$	$FEV_1 > 90\%$ and $FEF_{25-75\%} > 75\%$
0-p[+]	Not included	FEV_1 81–90% and/or $FEF_{25-75\%} \leqslant 75\%$
1	FEV_1 66–80%	FEV_1 66–80%
2	FEV_1 51–65%	FEV_1 51–65%
3	$FEV_1 \leqslant 50\%$	$FEV_1 \leqslant 50\%$

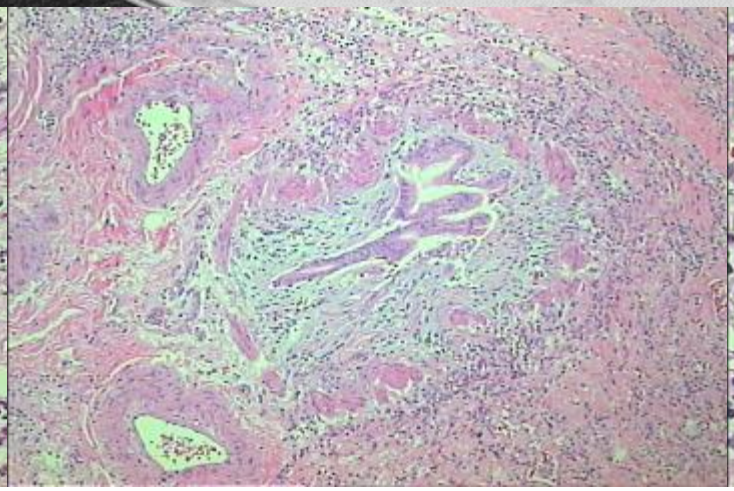
The peak incidence is between 7 and 12 months

Allogeneic BM-stem cells transplant: BO 10% of Pts









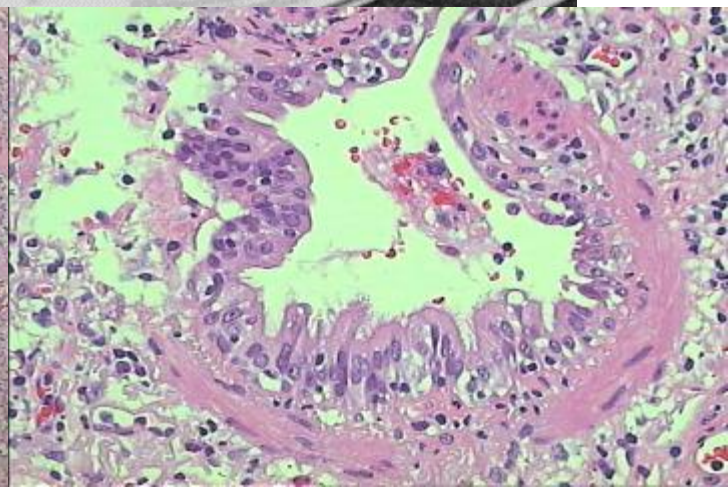


TABLE 7 Risk factors associated with bronchiolitis obliterans syndrome

Primary graft dysfunction (PGD)
Acute cellular rejection
Lymphocytic bronchiolitis
Humoral rejection (*e.g. de novo* anti-human leukocyte antigen antibodies)
Gastro-oesophageal reflux and microaspiration
Infection
- Viral
- Bacterial
- Fungal

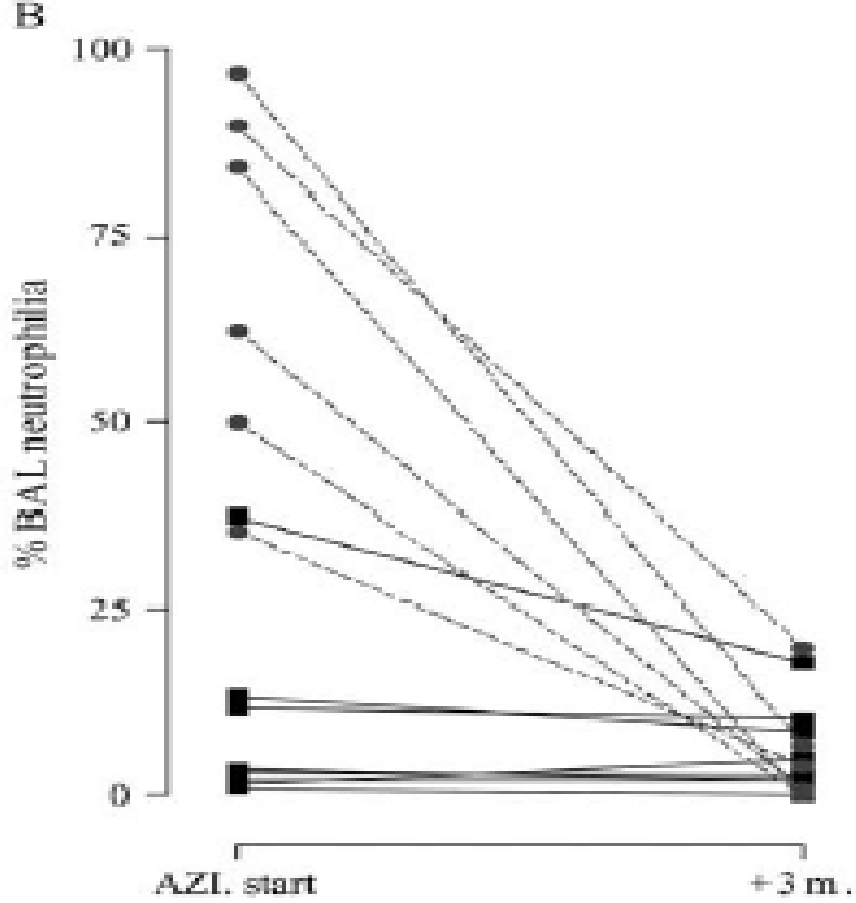
Persistent neutrophil influx and sequestration (bronchoalveolar lavage neutrophilia)
Autoimmunity (collagen V sensitisation)

MACROLIDES AND BRONCHIOLITIS OBLITERANS SYNDROME

Azithromycin Reduces Airway Neutrophilia and Interleukin-8 in Patients with Bronchiolitis Obliterans Syndrome

Geert M. Verleden*, Bart M. Vanaudenaerde*, Lieven J. Dupont, and Dirk E. Van Raemdonck

Departments of Respiratory Disease and Thoracic Surgery, and Lung Transplantation Unit, University Hospital Gasthuisberg, Leuven, Belgium



Azithromycin 250 mg/**d for 5 d. then 250 mg 3 t/wk**

AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE VOL 174 2006

Effect of Azithromycin in Airflow decline-free survival After Allogeneic Hematopoietic Stem Cell Transplant: the ALLOZITHRO Randomized Clinical Trial
Bergeron A, et al. JAMA 2017, 318: 557-566

Among pts undergoing allogeneic HSCT for hematological malignancy, early administration of azithromycin resulted in worse airflow decline-free survival than did placebo.

Table 3. Emerging phenotypes of CLAD: key features*

Entity	Classic BOS	NRAD	RAS
Time of Onset	• Late (usually 2-3 years post-transplant, but may occur earlier) • ≈80% prevalence at 10 years post-transplant	• Usually occurs early (e.g. 3-6 months post-transplant)	• Tends to occur later but may occur at any time • Accounts for approximately 1/3 of CLAD cases
Physiology	• Obstructive (FEV1 ≤80% of stable baseline value)	• Obstructive (FEV1 ≤80% of stable baseline value)	• Restrictive (e.g. FEV1 ≤80% and TLC ≤90% of stable baseline values)
HRCT Imaging	• Air trapping often present • No/minimal infiltrates • ± bronchiectasis	• Changes of bronchiolitis ("tree-in-bud", thickened airway walls, peri-bronchiolar infiltrates often present) • ± air trapping	• Parenchymal infiltrates usually present (DAD often present) • ± bronchiectasis • ± air trapping
Histopathology	• OB (difficult to diagnose via transbronchial biopsy)	• Cellular bronchiolitis	• Fibrosis (thickened septae and pleurae) • DAD often present • ± OB
Clinical course	• Typically progressive but may stabilize • Recipients may have coexistent chronic bacterial infection	• High likelihood of significant response to azithromycin (may no longer meet criteria for persistent BOS if recipient is an azithromycin responder)	• Tends to be relentlessly progressive • Significantly worse prognosis than BOS
Other	• Usually responds poorly to pharmacologic therapies • Can have outcome similar to primary transplant following lung retransplantation	• BAL neutrophilia (e.g. ≥15% on differential cell count) correlates with response to azithromycin therapy	• Increased risk of RAS if new onset DAD detected >90 days post-transplant

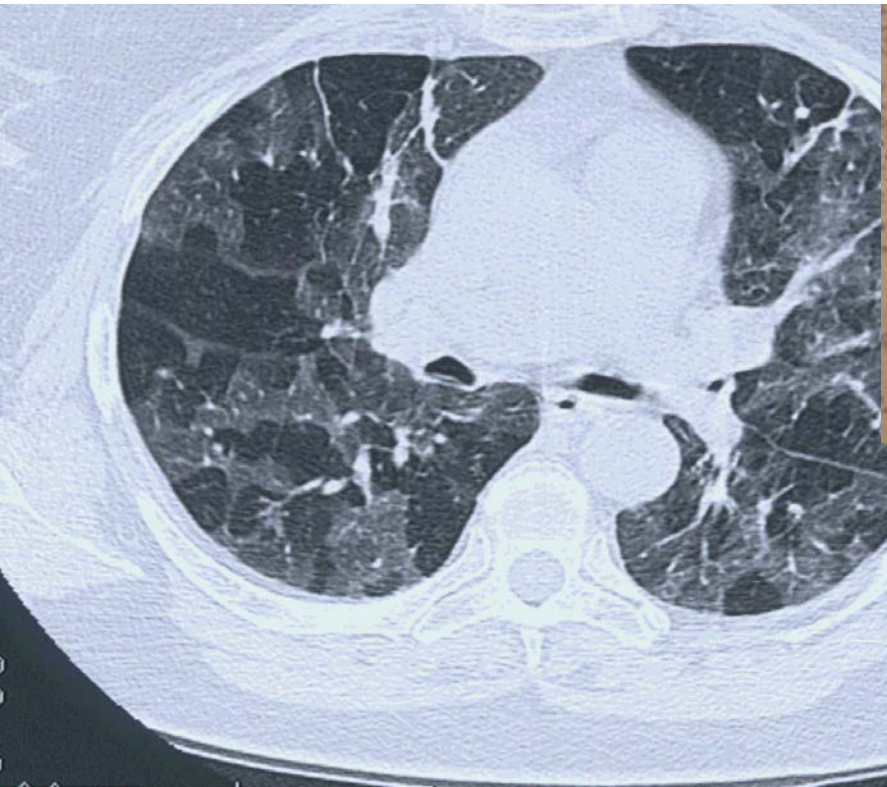
*Infection, other pathologies (e.g. acute cellular rejection, lymphocytic bronchiolitis, antibody-mediated rejection), and/or other causes of allograft dysfunction (e.g. significant gastroesophageal reflux, pleural disorders, anastomotic dysfunction, obesity, thromboembolic disease, recurrent primary lung disease, etc.), must be ruled out.

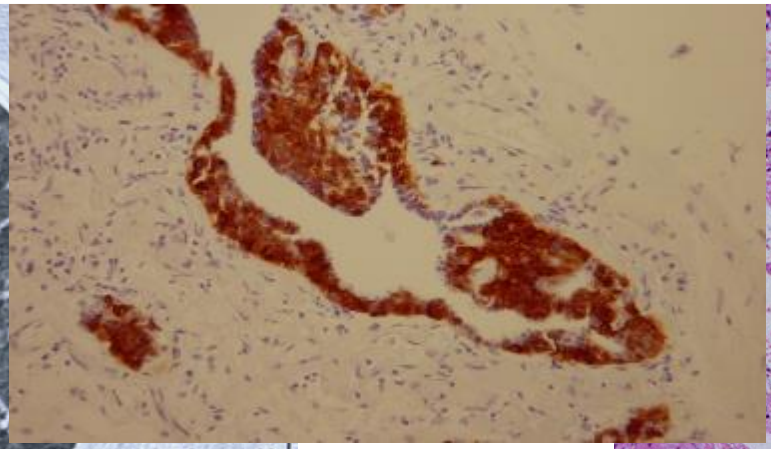
Abbreviations: BAL = bronchoalveolar lavage; BOS = bronchiolitis obliterans syndrome; CLAD = chronic lung allograft dysfunction; DAD = diffuse alveolar damage; NRAD = neutrophilic reversible allograft dysfunction; OB = obliterative bronchiolitis; RAS = restrictive allograft syndrome

DIFFUSE IDIOPATHIC PULMONARY NEUROENDOCRINE HYPERPLASIA w/t BRONCHIOLITIS

In 1992 Aguayo et al reported 6 patients, all nonsmokers, with moderate chronic airflow obstruction, progressive dyspnea.

•Women • airflow obstruction • bronchiolar neuroendocrine





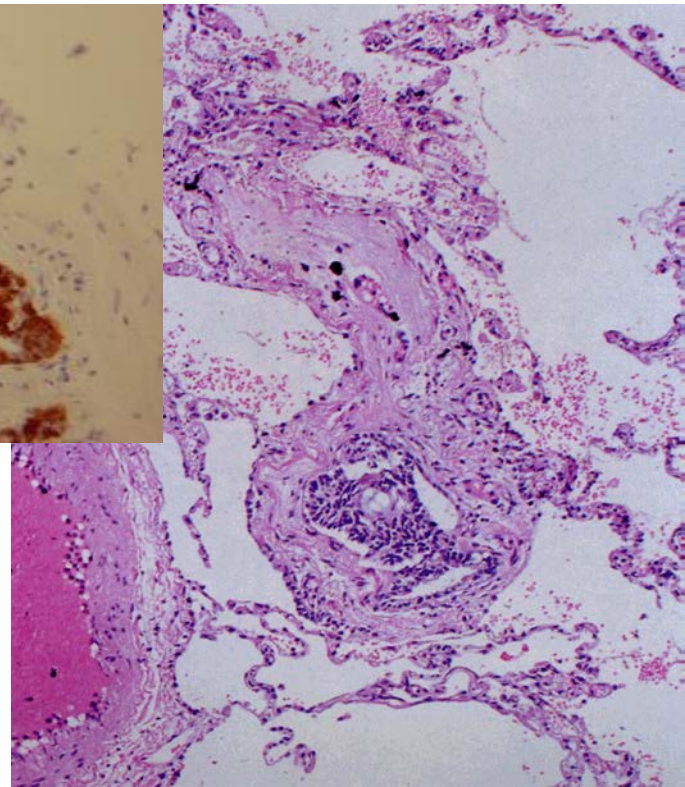


TABLE 1] Subject Characteristics

Characteristic	Value
No. subjects	30
Sex	
Male	0 (0)
Female	30 (100)
Tobacco use	
Former	11 (37)
Never	19 (63)
Median (range) age at diagnosis, y	62 (45-75)
Symptoms prior to diagnosis	
Cough	8 (27)
< 5 y	1 (3)
5-10 y	0 (0)
> 10 y	7 (23)
Dyspnea	6 (20)
< 5 y	3 (10)
5-10 y	1 (3)
> 10 y	2 (7)
Combination	13 (43)
< 5 y	3 (10)
5-10 y	3 (10)
> 10 y	7 (23)
Diagnosis prior to DIPNECH	
Asthma	12 (40)
COPD	3 (10)
Bronchiolitis	4 (13)
No diagnosis given	8 (27)
Records unavailable	3 (10)
Pulmonary function at diagnosis	
FEV_1, % predicted	49.8 ± 23.9
FVC, % predicted	59.1 ± 19.4
FEV_1/FVC	63.4 ± 14.0
RV, % predicted	223.6 ± 97.9
D_LCO, % predicted	74.7 ± 17.2
Treatment	
Oral steroids	14 (46)
Inhaled steroids	20 (67)
Octreotide LAR	11 (37)
Resection of a carcinoid	9 (30)

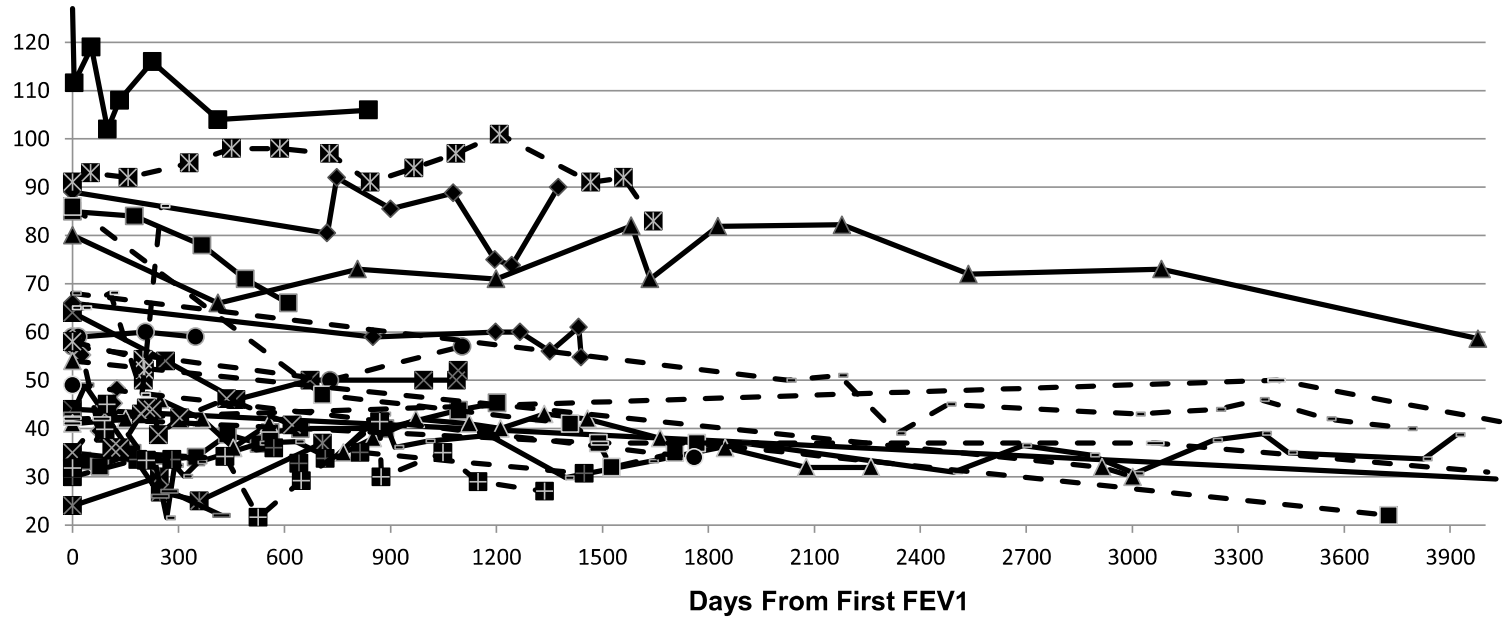


TABLE 4] Proposed Diagnostic Criteria for DIPNECH

Major Criteria	Surgical Lung Biopsy	Per World Health Organization Criteria[a]
Minor criteria	1. Clinical presentation	Woman, aged 45-67 y, cough ± dyspnea for 5-10 y
	2. Pulmonary function	Increased RV, TLC, fixed obstruction, low D_LCO that corrects with V_A
	3. High-resolution CT scan	Diffuse pulmonary nodules 4-10 mm, > 20 nodules, mosaic attenuation or air trapping > 50% of lung
	4. Transbronchial biopsy	Proliferation of pulmonary neuroendocrine cells
	5. Serum markers	Elevated serum chromogranin A levels

TLC = total lung capacity; V_A = alveolar volume. See Table 1 legend for expansion of other abbreviations.
[a]Generalized proliferation of pulmonary neuroendocrine cells ± fibrosis, excluding other pathology that may induce reactive proliferation.

DIFFUSE PANBRONCHIOLITIS

Homma H. Diffuse panbronchiolitis. Nihon Kyobu Shikkan Gakkai Zasshi 1975, 13: 383-395

Homma H et al. Diffuse panbronchiolitis: a disease of the transitional zone of the lung. Chest 1983, 83: 63-69

Poletti V et al. Diffuse panbronchiolitis observed in an Italian. Chest 1990, 98: 515-516

Randhawa P et al. Diffuse panbronchiolitis in North America: report of three cases and review of the literature. AJSP 1991, 15: 43-47

Eur Respir J 2006; 28: 862–871
DOI: 10.1183/09031936.06.00131805

SERIES "RARE INTERSTITIAL LUNG DISEASES"
Edited by C. Vogelmeier and U. Costabel
Number 4 in this Series

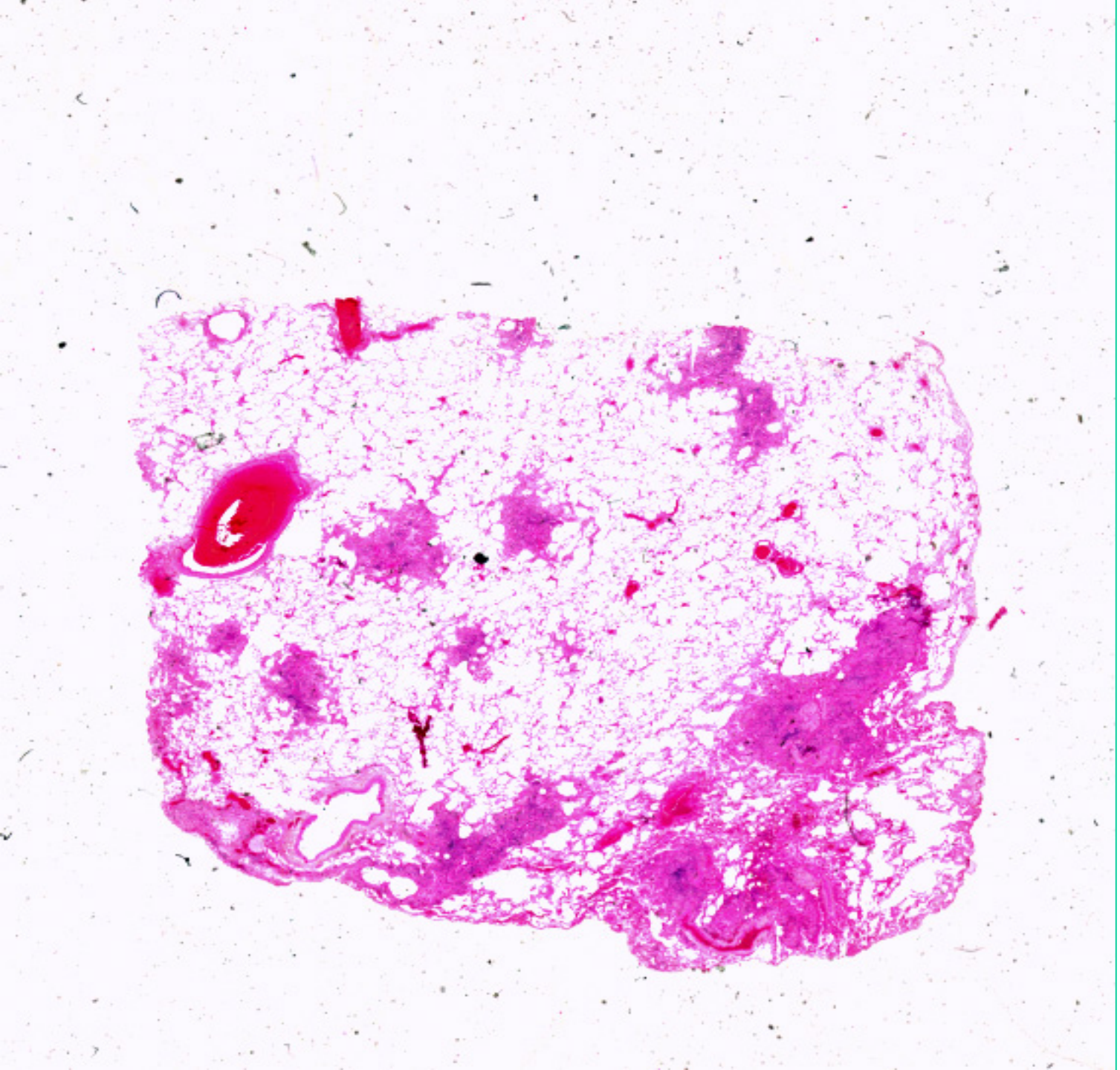
Diffuse panbronchiolitis

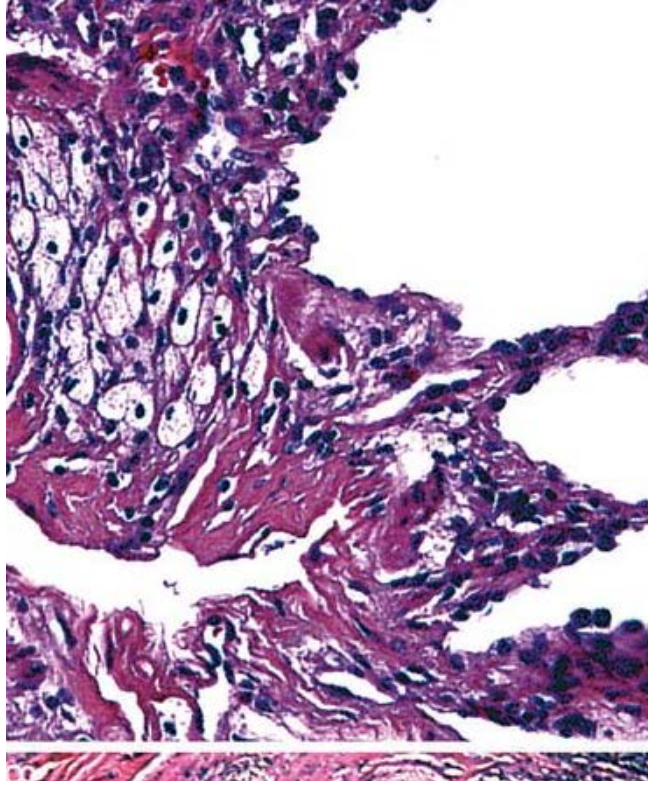
V. Poletti*,#, G. Casoni*, M. Chilosi¶ and M. Zompatori+

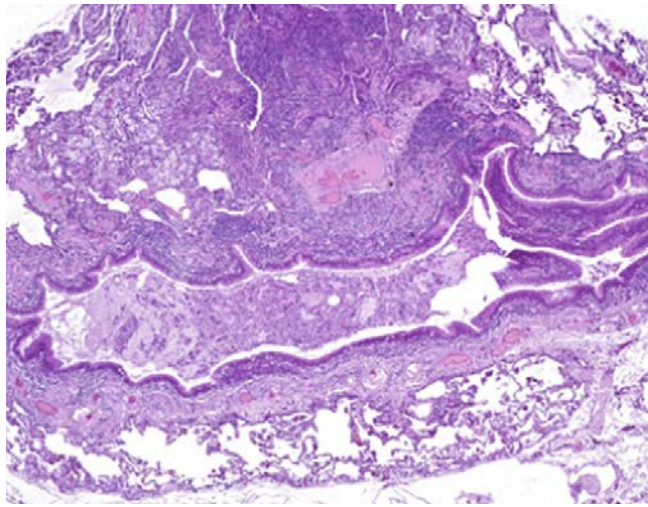
TABLE 2 Diagnostic criteria for diffuse panbronchiolitis

1. Persistent cough, sputum and exertional dyspnoea
2. History of chronic paranasal sinusitis
3. Bilateral diffuse small nodular shadows on a plain chest radiography film or centrilobular micronodules on chest computed tomography images
4. Coarse crackles
5. FEV1/FVC <70% and P_{a,O_2} <80 mmHg
6. Titre of cold haemagglutinin ⩾64

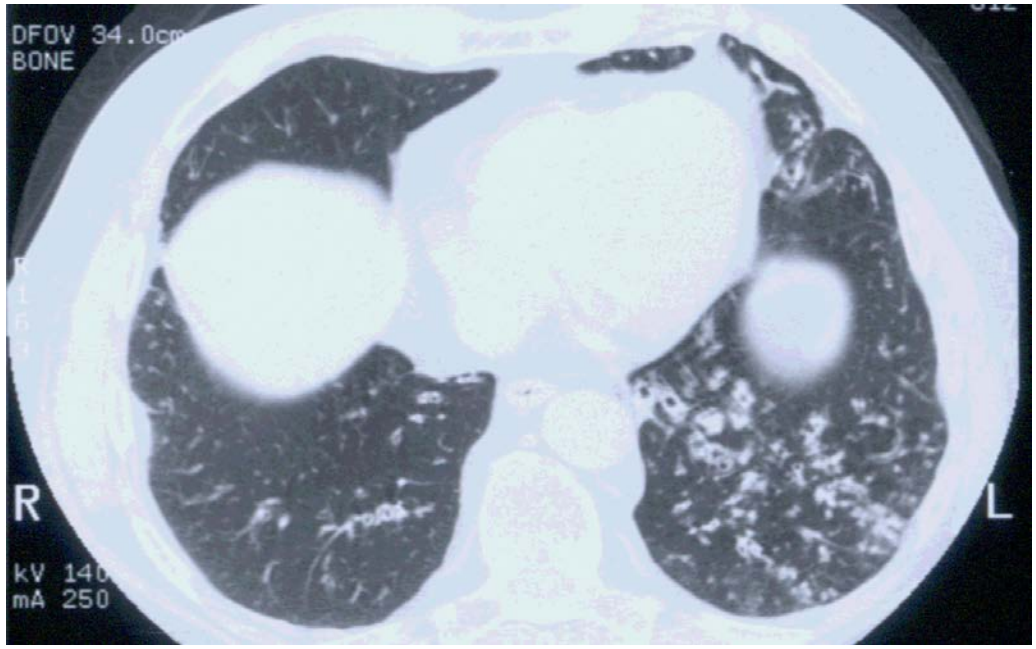
FEV1: forced expiratory volume in one second; FVC: forced vital capacity; P_{a,O_2}: arterial oxygen tension. Cases definitely established should fulfil criteria 1, 2 and 3, along with at least two of criteria 4, 5 and 6. These parameters are useful for carrying out an epidemiological analysis. In countries in which the disease is very rare, surgical lung biopsy is required to make a diagnosis. Criteria are taken from a working group of the Ministry of Health and Welfare of Japan [67]. 1 mmHg=0.133 kPa.

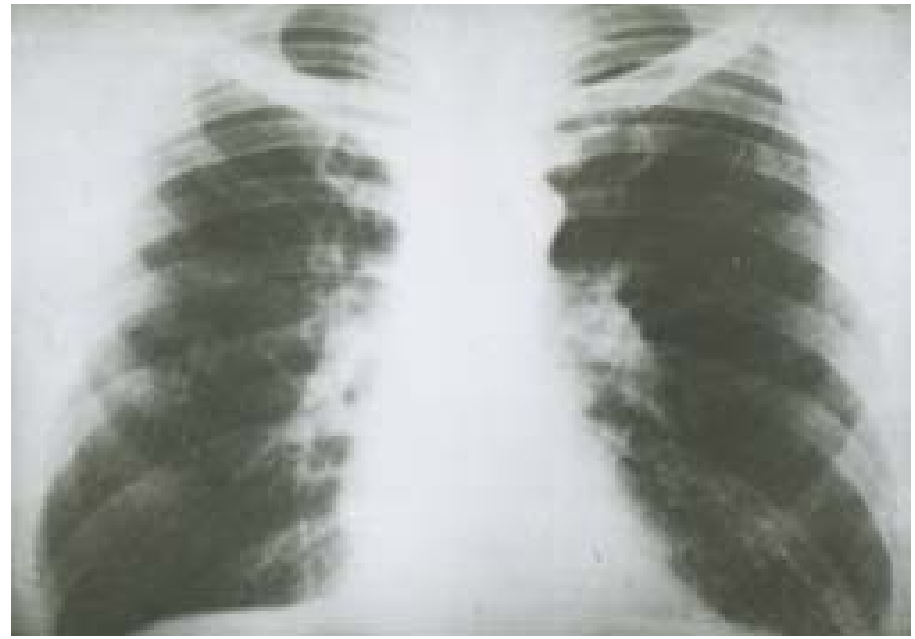




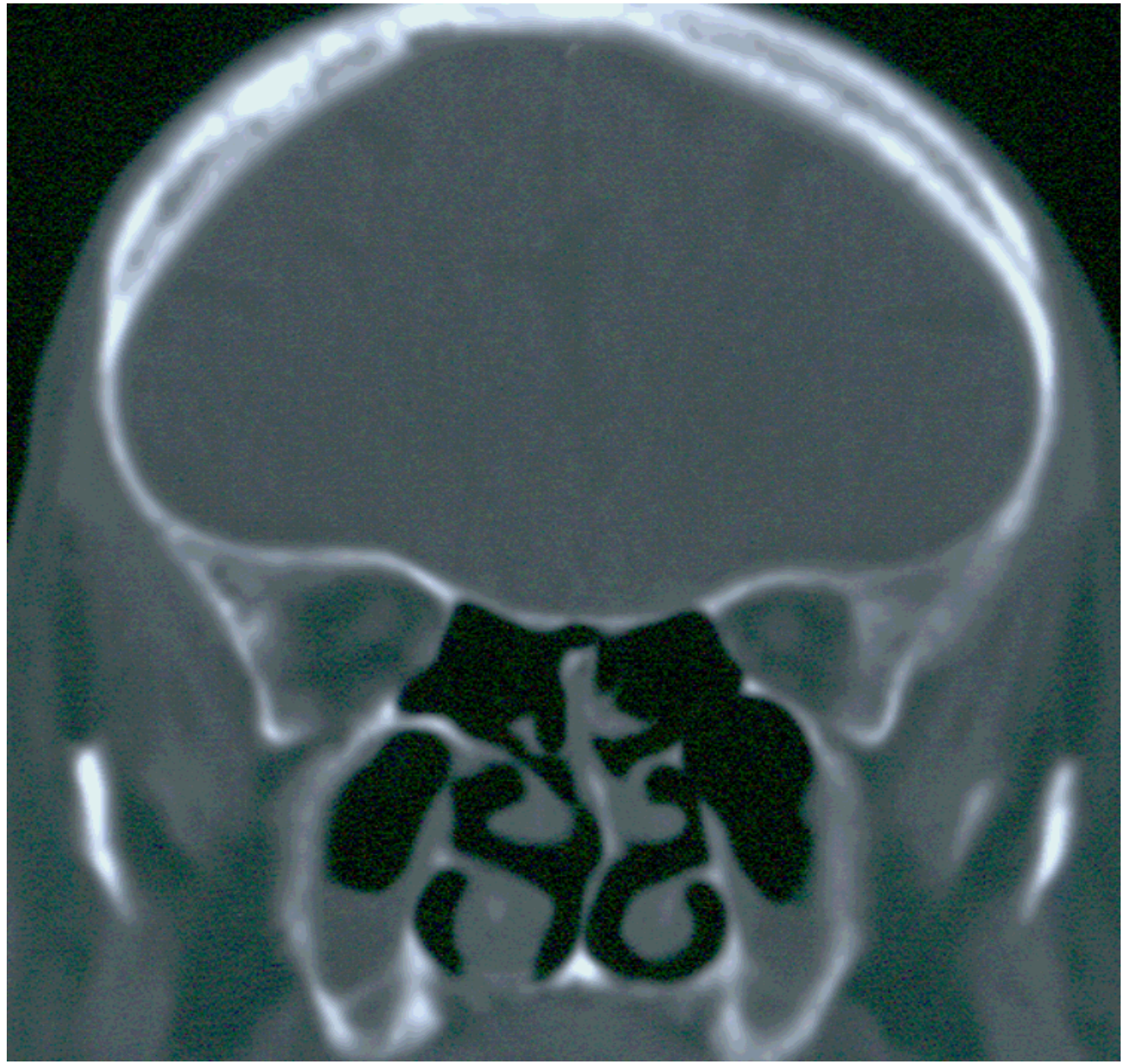


DPB: Imaging





HRCT Scan	tree in bud pattern
	cystic lesions
	bronchiectasis
Ancillary finding	pansinusitis



Diffuse Panbronchiolitis-DPB

Epidemiology

Male female ratio 1.4/1

2/3 nonsmokers

Prevalence 11/100,000

Pathogenesis

*Neutrophyl accumulation

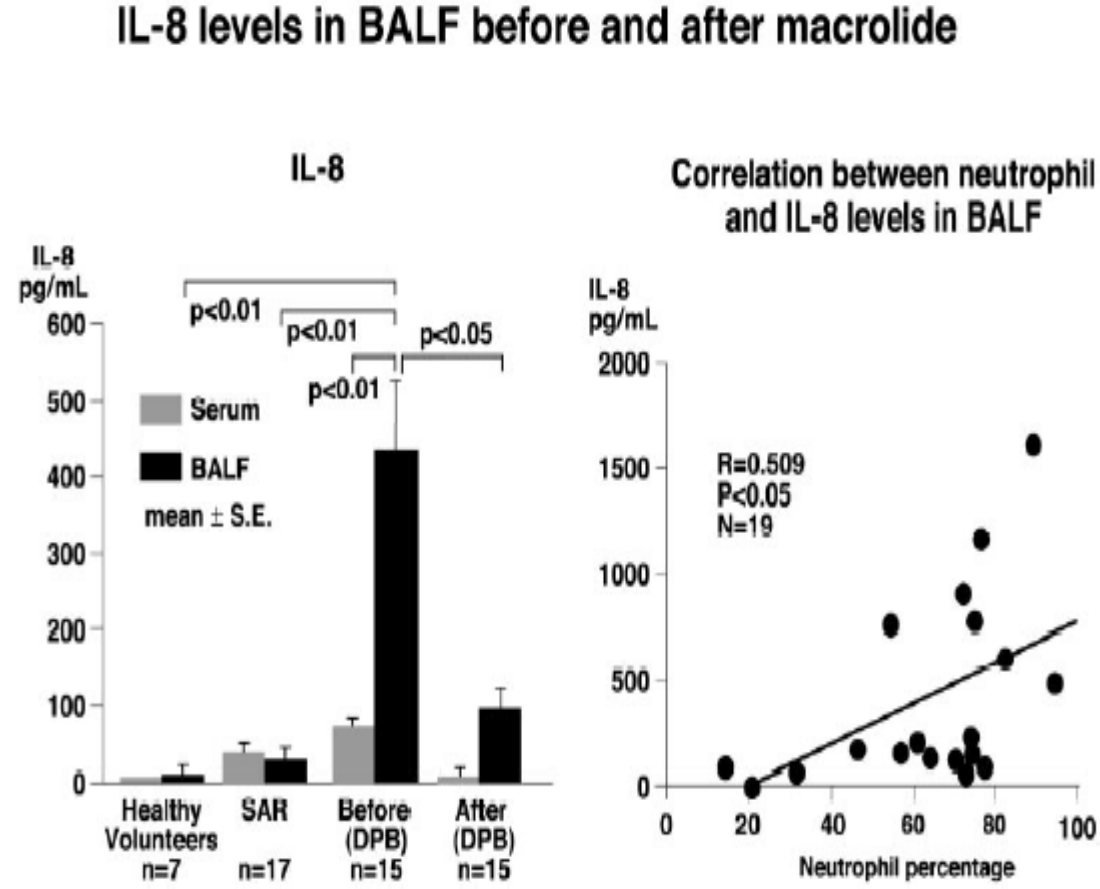
*Lymphocytitc accumulation

*CD1a+ cells

*genetic predisposition (HLA-Bw54)

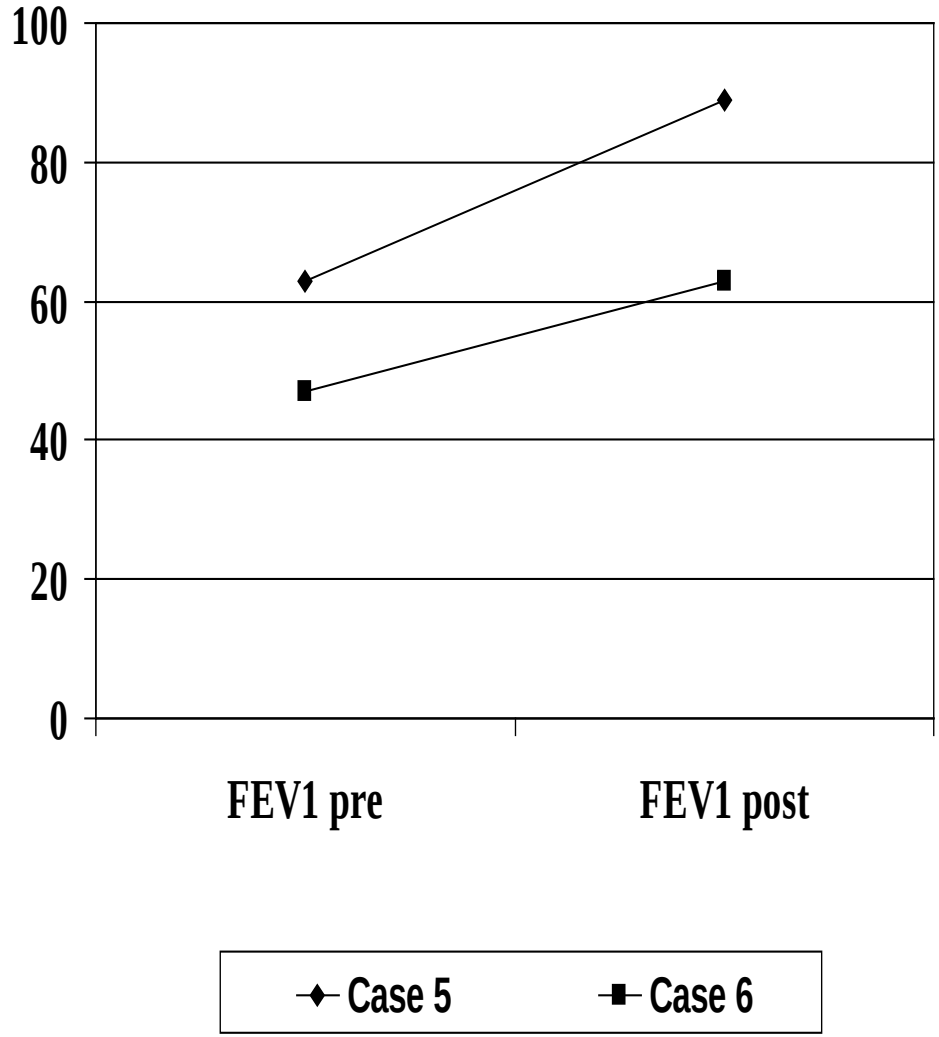
Lin X, et al. Macrolide for DPB Cochrane Collaboration, 2015

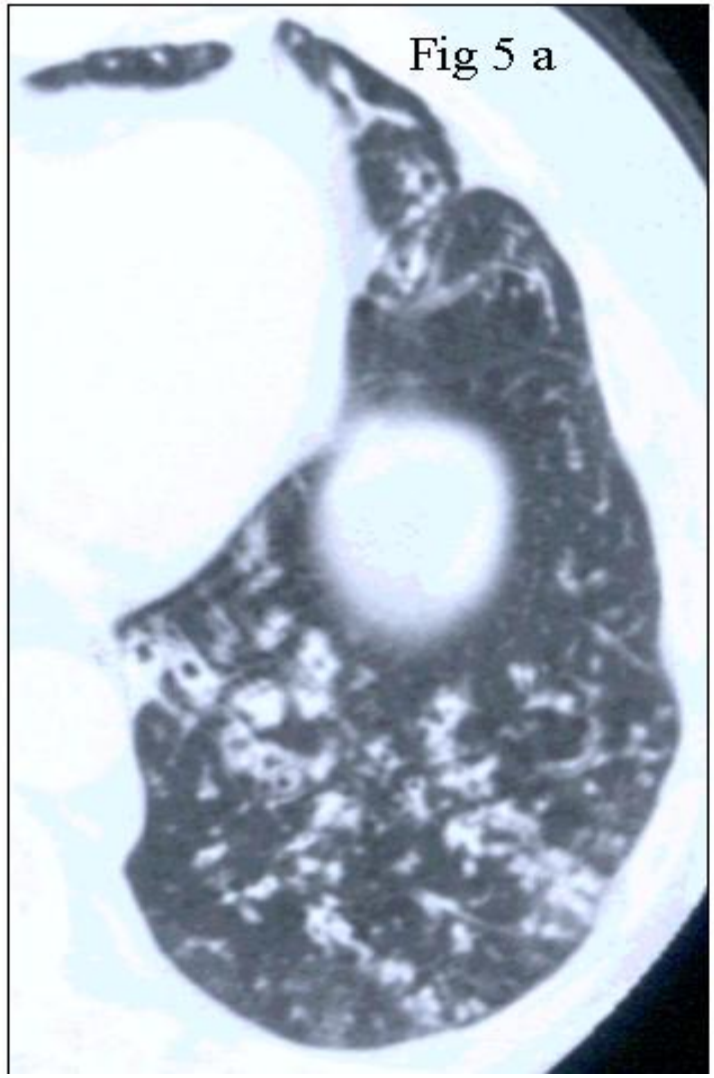
Only one RCT
(19 participants) with
significant methodological
limitations was included
in this review.
It found that the computerised
tomography images of all
participants treated with a
long-term, low-dose macrolide
(erythromycin) improved from
baseline, while the images of
71.4% of participants in the control
group (with no treatment) worsened
and 28.6% remained unchanged.
Adverse effects were not reported.

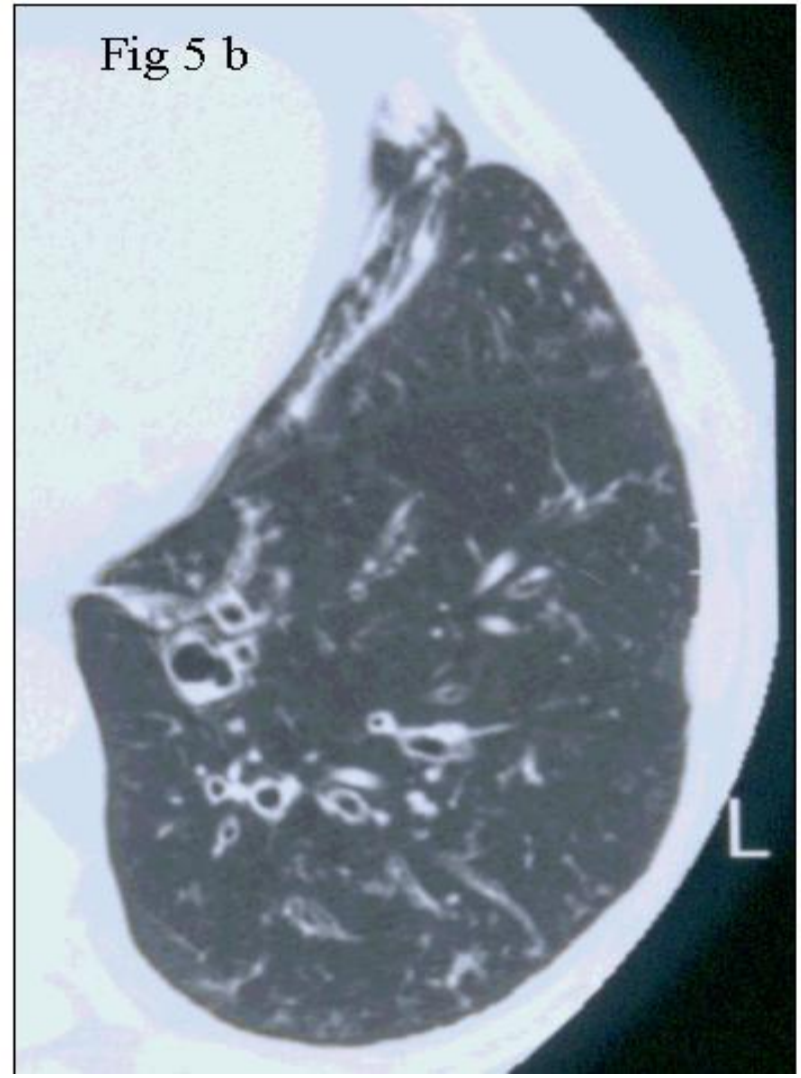


Sakito O, et al. Respiration 1996, 63: 42-48

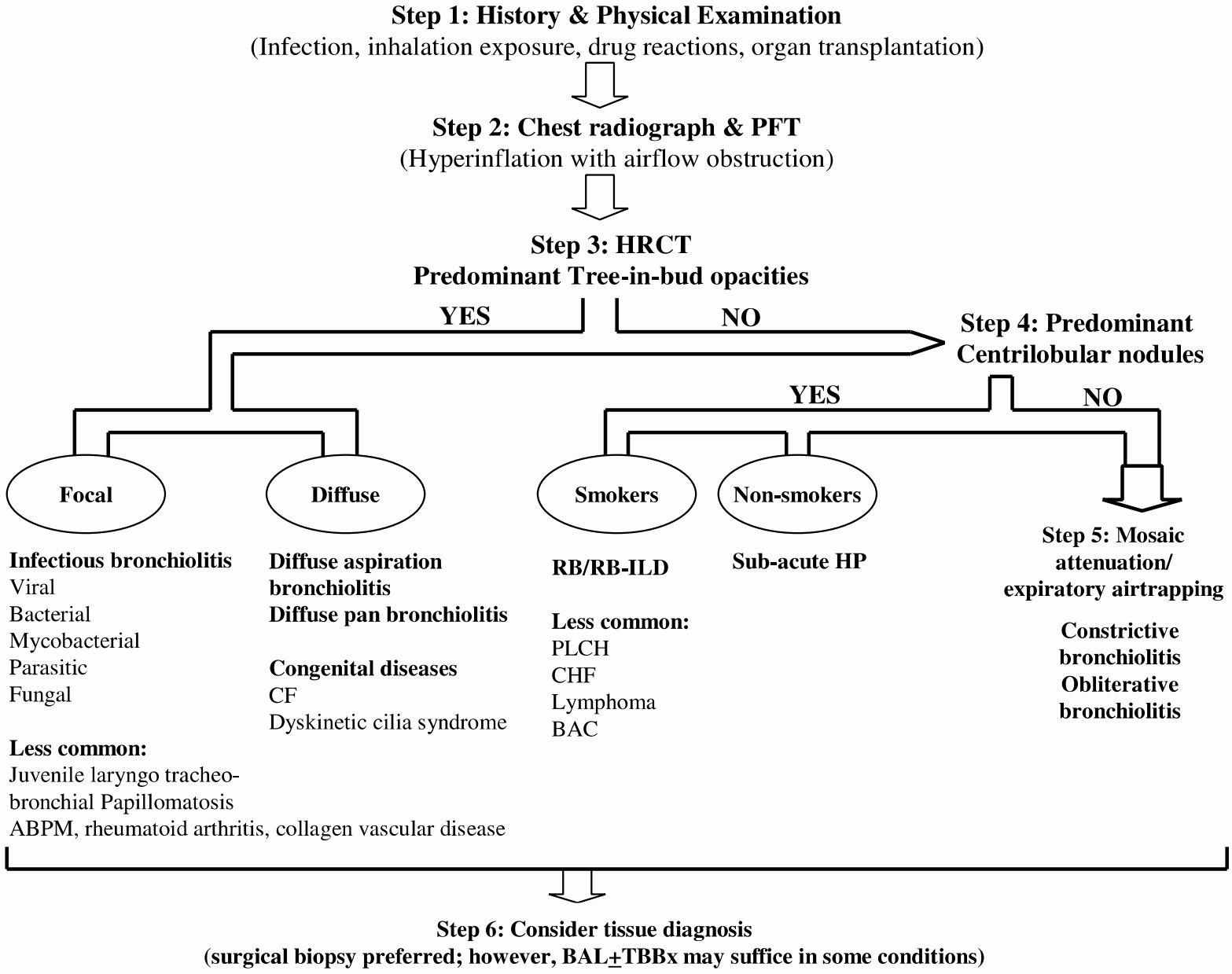
Effects of low dose macrolides in two DPB cases







Macrolide effects in DPB


Step 1: History & Physical Examination
(Infection, inhalation exposure, drug reactions, organ transplantation)
Step 2: Chest radiograph & PFT
(Hyperinflation with airflow obstruction)
Step 3: HRCT
Predominant Tree-in-bud opacities
YES
NO
Step 4: Predominant
Centrilobular nodules
YES
NO
Focal
Diffuse
Smokers
Non-smokers
Step 5: Mosaic attenuation/ expiratory airtrapping
Infectious bronchiolitis
Viral
Bacterial
Mycobacterial
Parasitic
Fungal
Less common:
Juvenile laryngo tracheo-bronchial Papillomatosis
ABPM, rheumatoid arthritis, collagen vascular disease
Diffuse aspiration bronchiolitis
Diffuse pan bronchiolitis
Congenital diseases
CF
Dyskinetic cilia syndrome
RB/RB-ILD
Less common:
PLCH
CHF
Lymphoma
BAC
Sub-acute HP
Constrictive bronchiolitis
Obliterative bronchiolitis
Step 6: Consider tissue diagnosis
(surgical biopsy preferred; however, BAL±TBBx may suffice in some conditions)