ESTI European Society of Thoracic Imaging

ESTI WINTER COURSE 2018

December 06-08, 2018

TROMSØ, NORWAY

FINAL PROGRAMME

WELCOME WORDS

Dear colleagues & friends,

Welcome to the first ESTI Winter Course!

The programme will focus on elements from the level 3 chest radiology curriculum from the ESR. This includes diseases of the great vessels, infections, malignancies in pleura, mediastinum and lungs, interstitial lungs diseases, nodules management and lung cancer screening, intervention, trauma, ultrasound, PET-CT and MRI of the lungs.

The course is meant to help candidates interested in sitting for the ESTI diploma exam as well as serve as a solid repetition for experienced chest radiologists looking to refresh their knowledge in chest radiology.

This is the first time the ESTI is organising such a course and we are very excited about it. We hope that this format will be educational and further the interest in chest thoracic radiology in both, young and mature.

Enjoy your stay!

Anagha P. Parkar
ESTI Winter Course 2018 Organiser

ESTI WINTER COURSE 2018 FACULTY

Pierre-Yves Brillet, Bobigny/FR
Susan Copley, London/UK
Sujal Desai, London/UK
Thomas Frauenfelder, Zurich/CH
Anna Rita Larici, Rome/IT
Anastasia Oikonomou, Toronto/CA
Anagha P. Parkar, Bergen/NO
Mathias Prokop, Nijmegen/NL
Helmut Prosch, Vienna/AT
Cornelia Schaefer-Prokop, Amersfoort/NL

PIERRE-YVES BRILLET

Professeur des Universités – Praticien Hospitalier (Md-PhD, Prof.)
Head of the Radiology department
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125 rue de Stalingrad
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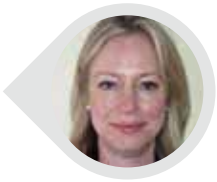
- Master 1 of anatomy (1997 : Faculté de médecine de Cochin, Paris V)
- Master 1 of biostatistics (1998 : Faculté de médecine du Kremlin Bicêtre, Paris Sud)
- Diplôme d'Etudes Approfondies (first year of PhD) en Imagerie médicale (2001, Kremlin Bicêtre, Paris Sud). « Tumoral imaging with USPIO: in vitro and in vivo results »
- Doctorat d'Etat en Sciences (PhD), discipline : Science de la Vie et de la Matière, Specialty : Mathematics and informatic (2008, Université René Descartes, Paris V). « bronchial remodeling : from imaging to CAD »

SUSAN COPLEY



Sue Copley was appointed Consultant Radiologist at Imperial College NHS Trust London in 2001 and Reader in Thoracic Imaging, Imperial College, London in 2008. She is an author of over 50 peer reviewed papers, 12 book chapters and 2 textbooks. She is an Editorial Board Member for Clinical Radiology and reviews for several European and North American Journals. She is the past President of the British Society of Thoracic Imaging (BSTI) (2014-2017) and previous General Secretary of ESTI (2015-2016). Research interests include benign asbestos-induced pleuroparenchymal disease, effects of ageing and obesity on the lung.

Education and Training

MB.BS (London) 1990
Member of the Royal College of Physicians (MRCP) 1994
Fellow of the Royal College of Radiologists (FRCR) 1997
MD (University of London) 2000
Fellow of the Royal College of Physicians (FRCP) 2009

THOMAS FRAUENFELDER

Prof. Dr. Thomas Frauenfelder, MD, is a senior staff radiologist, vice-director and section chief of chest imaging at the Department of Radiology of the University Hospital Zurich. He had his training in Zurich and was research resident at National Centre of Competence in Research (NCCR) for Computer aided and image guided medical interventions (Co-Me) at the ETH. His main research fields encompass cardiovascular and pulmonary imaging. The focus during the last years was on CT and lung imaging. Different projects focussed on the validation of techniques for dose reduction by maintaining image quality. Currently he is focusing on the use of texture analysis and AI in mixed connective diseases related interstial lung disease. He is member of the executive board of ESTI (European Society of Thoracic Imaging).

ANASTASIA OIKONOMOU

Dr Anastasia Oikonomou completed medical school and diagnostic radiology residency in Thessaloniki, Greece and did fellowships in thoracic imaging in London, UK and in Ottawa and Vancouver, Canada. She completed a cardiac imaging fellowship later in Ottawa, Canada. After working for 10 years in Democritus University of Thrace, Greece she moved to Toronto where she is currently working as a Staff Cardiothoracic radiologist in the Medical Imaging Department in Sunnybrook Health Sciences Centre and she is appointed the Head of the Cardiothoracic Division. She is an Assistant Professor of University of Toronto and she is the site director of the cardiothoracic imaging fellowship program at University of Toronto.

ANAGHA P. PARKAR

Dr Angha P. Parkar is a general radiologist with a special interest in thoracic, cardiac and musculoskeletal imaging, currently working in the Haraldsplass Deaconess Hospital in Bergen, Norway.
She is also the secretary of the ESTI, and an active member of the ESSR and the ESR contributing on various boards and subcomittees.

MATHIAS PROKOP

Mathias Prokop, M.D. has been appointed head of the department of Radiology and Nuclear Medicine at Radboud University Nijmegen in 2009 after having served as Professor of Radiology at UMC Utrecht since 2004. In 1998 he started working as an associate professor of Radiology at the University of Vienna Medical School, Austria. He trained as a radiologist at Hanover Medical School, Germany and earned a Bachelor of Science in Physics at Philipps-University Marburg, Germany.

Prof. Prokop is an expert in body imaging with a special focus on multislice CT and new imaging technologies. As one of the first users of the various generations of multislice CT scanners, he is working on new and improved imaging applications, with a special focus on cardiovascular and thoracic imaging.

The author of more than 350 articles in peer-reviewed scientific journals, 50 book chapters, 300 scientific abstracts, and 300 invited lectures, Prof. Prokop has published a textbook on body computed tomography that focuses specifically on multislice technology and has been translated into 5 languages. Prof. Prokop served on several industry advisory boards as well as numerous scientific committees. He is fellow of the Society of Computed Body Tomography & Magnetic Resonance (SCBT-MR). He is an elected member of the Fleischner Society and the Society of Strategic Studies Radiology (IS3R). He has been consultant to the International Atomic Energy Agency (IAEA) on radiation protection in CT and the World Health Organization (WHO) on individual health assessment. He was vice chairman of the Dutch Radiological Society and is honorary member of the Hungarian Society of Radiology. He was the Josef Lissner Honorary Lecturer of the European Society of Radiology (ESR) in 2017 and the Roentgen Lecturer of the German Radiologic Society (DRG) in 2016. He received numerous awards from leading radiologic societies, most recently the Teaching Award of the European School of Radiology (ESOR).

HELMUT PROSCH

Helmut Prosch, MD works for the Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna, Vienna, Austria. Helmut Prosch is an Associate Professor of Radiology and section chief of thoracic imaging at the Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna. He obtained his medical degree in 2000 from the University of Vienna. Helmut Prosch trained in Radiology at the Otto Wagner Hospital in Vienna, Austria. Before, he worked as research fellow at the Children's Cancer research institute in Vienna. His research focuses on diagnosis and staging of lung cancer and deep learning for the diagnosis of diffuse parenchymal lung diseases. Helmut Prosch has published more than 100 articles, reviews or book chapters.

PROGRAMME OVERVIEW

THURSDAY, DECEMBER 06

12:00	**Registration**
13:00-14:00	Welcome Lunch
14:00-15:20	**Session 1** *Moderator: A.P. Parkar, Bergen/NO*
14:00	Welcome *A.P. Parkar, Bergen/NO*
14:05	Acute aortic syndrome, diagnosis/post treatment *A.P. Parkar, Bergen/NO*
14:30	Vasculitides *P-Y. Brillet, Bobigny/FR*
15:00	Pulmonary embolism, pulmonary hypertension *A.P. Parkar, Bergen/NO*
15:20-15:50	Coffee Break
15:50-16:50	**Session 2** *Moderator: P-Y. Brillet, Bobigny/FR*
15:50	Ultrasound of the lungs *T. Frauenfelder, Zurich/CH*
16:20	Imaging of mycobacterial infection *P-Y. Brillet, Bobigny/FR*
16:50-17:15	Coffee Break
17:15-18:10	**Session 3** *Moderator: H. Prosch, Vienna/AT*
17:15	Thoracic interventions tips and tricks *T. Frauenfelder, Zurich/CH*
17:40	Mediastinal tumors *H. Prosch, Vienna/AT*

FRIDAY, DECEMBER 07

08:30-09:15	**Session 4** *Moderator: T. Frauenfelder, Zurich/CH*
08:30	Pleural neoplasms *A.P. Parkar, Bergen/NO*
08:45	HRCT patterns (nodular, linear, mosaic) *T. Frauenfelder, Zurich/CH*
09:15-09:25	Coffee Break
09:25-10:25	**Session 5** *Moderator: P-Y. Brillet, Bobigny/FR*
09:25	Drug induced pulmonary disease *C. Schaefer-Prokop, Amersfoort/NL*
09:55	Imaging COPD *P-Y. Brillet, Bobigny/FR*
10:25-10:40	Coffee Break
10:40-12:10	**Session 6** *Moderator: A.P. Parkar, Bergen/NO*
10:40	Interstitial lung disease in collagenosis *C. Schaefer-Prokop, Amersfoort/NL*
11:10	CT of trachea and large airways *M. Prokop, Nijmegen/NL*
11:40	CT of small airways *S. Copley, London/UK*
12:10-13:10	**Industry sponsored lunch symposium „Recent developments in Chest imaging“**
	Artificial intelligence in chest reading – fiction or reality? *Prof.Dr. Michael Lell, Head of Radiology and Nuclear Medicine, Klinikum Nürnberg*
	Recent developments in lung cancer screening *Dr. Sebastian Schmidt, Siemens Healthineers, Computed Tomography*
13:10-14:10	Lunch Break

14:10-15:40 **Session 7**
Moderator: S. Copley, London/UK

14:10 Sarcoidosis and granulomatous disease
S. Desai, London/UK

14:40 Pneumoconioses
H. Prosch, Vienna/AT

15:10 Normal variants on HRCT
S. Copley, London/UK

15:40-16:10 Coffee Break

16:10-17:40 **Session 8**
Moderator: H. Prosch, Vienna/AT

16:10 Diffuse Parenchymal Lung Disease - Key Diagnostic Conundrums
S. Desai, London/UK

16:40 Management of incidental nodules
A.R. Larici, Rome/IT

17:10 Imaging evaluation after immunetherapy
H. Prosch, Vienna/AT

SATURDAY, DECEMBER 08

09:00-10:30	**Session 9** *Moderator: A.P. Parkar, Bergen/NO*
09:00	Thoracic trauma imaging *A. Oikonomou, Toronto/CA*
09:30	PET/CT evaluation lungs *M. Prokop, Nijmegen/NL*
10:00	Lung cancer staging *M. Prokop, Nijmegen/NL*
10:30-11:00	Coffee Break
11:00-13:00	**Session 10** *Moderator: A.P. Parkar, Bergen/NO*
11:00	Implementation of lung cancer MDTs *A.R. Larici, Rome/IT*
11:30	Lung infections viral/fungal *A. Oikonomou, Toronto/CA*
12:00	MRI of the lungs applications/future *A. Oikonomou, Toronto/CA*
12:30	Information about ESTI, Diploma, Paris 2019 & WCTI 2021 *A.R. Larici, Rome/IT; A.P. Parkar, Bergen/NO*
13:00-14:00	Farewell Lunch

ABSTRACT SYLLABUS

ACUTE AORTIC SYNDROME, DIAGNOSIS/POST TREATMENT

A.P. Parkar, Bergen/NO

Description

The term acute aortic syndrome includes 3 types of aorta pathology:

1. Aortic dissection
2. Penetrating aortic ulcer
3. Intramural hematoma

Aortic pathology usually occurs in the course of atherosclerotic disease, other causes include (endothel) medial degeneration, trauma or infection (mycotic). The symptoms are similar, thus imaging plays a vital role in diagnosis.
Imaging criteria to differentiate the types of aortic syndromes will be explained and illustrated with cases.
Post operatively, endo-leak is the most common finding, but dilatation, pseudo- aneurysms and re-rupture may also occur.

Learning objectives

- To learn about the protocols to examine the aorta
- To recognise the types of acute aortic syndromes, to recognise the post-operative complications

VASCULITIDES

P-Y. Brillet, Bobigny/FR

Description

The term "vasculitis" refers to rare disorders characterized by inflammation of blood vessel walls. Clinical features of each disease depend on the site, size, and type of vessel involved and on the relative amounts of inflammation, vessel destruction, and tissue necrosis. International Chapel Hill Consensus Conference takes into account the size of the predominantly affected vessel (small vessel, medium vessel, and large vessel vasculitis) as well as the presence of anti-neutrophil cytoplasm antibody (ANCA). Pulmonary involvement is frequent and can be observed in large vessel (Takayasu arteritis, Giant cell arteritis), small size (ANCA-associated vasculitis: microscopic polyangiitis, granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis), variable vessel size vasculitis (Behçet disease) and in other rare cases (systemic disease). Computed tomography can reveal 1) lung disease, showing patchy or diffuse ground glass opacities, nodules, consolidations, 2) large pulmonary or aortic arteries involvement and/or 3) airways involvement.

Take home message

- Computed Tomography features of each vasculitis depend on the site, size, and type of vessel involved and on the relative amounts of inflammation, vessel destruction, and tissue necrosis.
- Pulmonary involvement is most commonly seen with small vessel vasculitis (ANCA-associated vasculitis: microscopic polyangiitis, granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis)

Learning objectives

- To know the classification of vasculitis
- To recognize the main CT abnormalities observed in the lung, large vessels and/or airways
- To know the differentials of pulmonary involvement

PULMONARY EMBOLISM, PULMONARY HYPERTENSION

A.P. Parkar, Bergen/NO

Description

Pulmonary embolism is a common indication for CT, however the incidence is relatively low 60-70/100 000. CT is currently the gold standard for diagnosis, and adequate contrast filling and timing at imaging is vital for diagnosis. Imaging criteria of acute and chronic pulmonary embolism differ. Untreated chronic PE may lead to pulmonary hypertension.

Learning objectives

- To learn to optimise the CT protocol
- To differentiate acute and chronic PE
- To recognise pulmonary hyper tension on CT

ULTRASOUND OF THE LUNGS

T. Frauenfelder, Zurich/CH

Description

Ultrasound is increasingly used in the Intensive Care Unit. It may be used to confirm the presence of a pleural effusion and help to determine if it suitable for or requires drainage. US plays a key role in guiding chest drain insertion and identifying post insertion complications. More recently, it has been shown to be useful in diagnosing a pneumothorax, particularly in the context of a recent line insertion. It may also be of value in diagnosing heart failure, infection and has been reported to be of value in diagnosing pulmonary embolic disease.

Learning objectives

- To learn the basic findings and how to interpret them
- To become familiar with the strengths and limitations of the technique

IMAGING OF MYCOBACTERIAL INFECTION

P-Y. Brillet, Bobigny/FR

Objectives

Pulmonary tuberculosis is a relatively rare disease in Western countries, outside risk populations (migrants; deprived socioeconomic background; chronic disease). It remains a major cause of morbidity and mortality worldwide, in particular in patients infected with human immunodeficiency virus (HIV) and because of the emergence of resistance to tuberculosis treatment in some countries. The disease has become difficult to control in certain populations due to the high prevalence of latent tuberculosis and reactivation. Radiological manifestations of pulmonary tuberculosis may vary depending on factors related to the host, especially tuberculosis history, age and immune status. Chest X-ray imaging remains the first line exploration, and is still used, despite its shortcomings, for screening patients at risk. Computed tomography can guide the diagnosis in difficult cases, highlighting signs of disease activity (cavitation, bronchial dissemination nodules and centrilobular micronodules, necrotic lymphadenopathy), accelerating therapeutic management. It allows the diagnosis of complications (fistula formation, miliary pulmonary destruction), especially hemoptysis. Computed tomography can be useful during or at the end of treatment in case of adverse developments and to review fibrotic sequelae. In a second part of the presentation, chest involvement related to non-tuberculous

mycobacteria (MBNT) will be briefly considered. These are rare infections, linked to the inhalation of non-tuberculosis organisms (mainly Mycobacterium avium-intracellulare and mycobacterium kansasii) without human transmission. Typically, it is an indolent fibrocavitary or nodular-bronchiectasic granulomatous lung infection.

Take home message

- Radiological manifestations of pulmonary tuberculosis may vary depending on factors related to the host, especially tuberculosis history, age and immune status.
- Computed tomography can guide the diagnosis in difficult cases, highlighting signs of disease activity (cavitation, bronchial dissemination nodules and centrilobular micronodules, necrotic lymphadenopathy), accelerating therapeutic management
- Computed tomography allows the diagnosis of complications (fistula formation, miliary pulmonary destruction) and can be useful during or at the end of treatment in case of adverse developments and to review fibrotic sequelae.

Learning objectives

- To be able to recognize a tuberculosis or non-tuberculosis mycobectaria infection on CT
- To know the radiologic manifestations of thoracic involvement according to immune status

THORACIC INTERVENTIONS TIPS AND TRICKS

T. Frauenfelder, Zurich/CH

Objectives

Initial histopathological analysis of a pulmonary lesion is mandatory whenever a lung cancer is suspected. Adequate material must be obtained for a definite histological diagnosis and molecular analysis. CT-guided lung biopsy is a reliable procedure that conveys a 90% sensitivity for the diagnosis of lung cancer. When performed in a secured environment after contraindications evaluation, its severe complications rate is low. Pneumothorax and pulmonary hemorrhage are the most common complications of percutaneous needle biopsy of the chest, whereas air embolism and tumor seeding are extremely rare. Attention to biopsy planning and technique and postprocedural care help to prevent or minimize most potential complications.

Learning objectives

- To describe the technique used for thoracic interventions
- To know potential complications of percutaneous needle biopsy of the chest
- To discuss the risk factors associated with the development of complications
- To explain how to prevent complications and manage complications when they occur

MEDIASTINAL TUMORS

H. Prosch, Vienna/AT

Description

The mediastinum is the space between the two lungs and is divided into the pre-vascular compartment, the visceral compartment and the paravertebral compartment. By assigning a mediastinal tumor to the respective compartment, the differential diagnosis can be significantly reduced. Tumors of the thymus, the thyroid gland, the lymphatic system or germ cell tumors are found in the pre-vascular mediastinum. In the visceral mediastinum tumors of the trachea, the esophagus, the heart or pericardium or lymphoma are seen. Tumors of the paravertebral mediastinum are mostly of neurogenic origin. In this lecture the characteristics of mediastinal tumors based on the new classification of mediastinal compartments will be discussed.

Learning objectives

- To become familiar with the classification of mediastinal compartment
- To learn about the differential diagnosis of mediastinal tumors

PLEURAL NEOPLASMS

A.P. Parkar, Bergen/NO

Description

CT is essential to differentiate benign from malignant pleural neoplasms. Common benign lesions are pleural fibromas and lipomas, while the 2 most common malignancies are mesotheliomas and pleural metastases.

CT criteria to differentiate pleural fibromas are size (> 10 cm), hypervascularisation and associated pleural effusion.

In malignant pleura thickening, the criteria include thickening > 1cm, involvement of mediastinal pleura, and nodularity. Metstatic disease is more often associated mediastinal lymphadenopathy and lung parenchyma.

Learning objective

- To learn the CT criteria to differentiate benign form malignant fibromas and pleural thickening

HRCT PATTERNS (NODULAR, LINEAR, MOSAIC)

T. Frauenfelder, Zurich/CH

Description

The goal of this lecture is to provide information about the anatomy of the lung and to provide a structured approach to the different interstitial patterns. High-resolution CT gives detailed morphologic information about lung structures. This allows distinguishing findings by their typical predominance in certain anatomical compartments. The three main patterns found in interstitial lung diseases are the nodular, the linear and mosaic pattern. During this lecture, a stepwise algorithm for differentiating the three different patterns will be provided that allows a pragmatic approach for a successful reading of HRCT. The base for the diagnosis is the description of the distribution and dominance of the patterns in relation to the bronchial, vascular and parenchymal lung structure.

Learning objectives

- To become confident in recognizing the anatomical compartments of the lung on HRCT
- To get familiar with a step-wise approach to interstitial diseases
- To describe typical imaging patterns of lung disease on HRCT using appropriate terminology

IMAGING COPD

P-Y. Brillet, Bobigny/FR

Description

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases (mainly tobacco). Induced inflammation induces irreversible reduction in caliber and number of small airways and ultimately destroys lung parenchyma (emphysema). On computed tomography, emphysema is

classified as centrilobular, panlobular, bullous and paraseptal. Additional important features include proximal airways abnormalities (tracheobronchomalacia, saber sheath trachea, tracheobronchial outpouching/diverticula, wall thickening, bronchiectasis), inflammatory small airways disease and interstitial lung abnormalities. Computed tomography allows the diagnosis of comorbidities and complications (exacerbation, infection, pulmonary embolism, pulmonary hypertension, atheroma, osteoporosis and/or cancer). Quantitative CT is useful for phenotyping patients according to the extent of emphysematous lung destruction, changes in airway walls, and expiratory air trapping.

Take home message

- On computed tomography, emphysema is classified as centrilobular, panlobular, bullous and paraseptal
- Additional important features include proximal airways, small airways and interstitial lung abnormalities

Learning objectives

- To describe the main radiological manifestations of COPD
- To understand the current challenges of COPD phenotyping
- To review the comorbidities and complications approachable by CT

CT OF SMALL AIRWAYS

S. Copley, London/UK

Learning objectives

- Small airways have a diameter of less than 2mm and consist of the terminal bronchiole and airways beyond
- Terminology regarding small airways disease can be confusing but can be broadly categorized into exudative bronchiolitis and constrictive obliterative bronchiolitis
- Exudative bronchiolitis is commonly associated with infection and characterized by a tree in bud pattern on CT
- There are many causes of obliterative constrictive bronchiolitis including post viral infection, toxic fume inhalation, graft versus host disease, connective tissue disease related and associated bronchiectasis
- The CT appearances of constrictive obliterative bronchiolitis are ‘indirect’ and consist of a mosaic attenuation pattern, vascular constriction and air trapping on end expiratory images

References
Hogg JC et al. Site and nature of airway obstruction in chronic obstructive lung disease. N Engl J Med 1968;278:1355-1360
Hansell DM. Obliterative bronchiolitis: individual CT signs of small airways disease and functional correlation. Radiology 1997; 203: 721-726
Hansell DM Small airways disease: detection and insights with computed tomography Eur Respir J 2001;17:1294

PNEUMOCONIOSES

H. Prosch, Vienna/AT

Description

Pneumoconiosis is the tissue reaction of the lung to inhaled inorganic dust. Most pneumoconioses are the consequence of long term occupational exposure to silica crystals (silicosis), coal dusts (coal workers pneumoconiosis), asbestos fibers (asbestosis), talc (talcosis), or metal dusts such as beryllium (berylliosis), aluminum or hard metals. Chest radiographs and CT play a central role in the diagnosis and follow up of pneumocoioses and – depending on the particular type of dust – may show (micro)nodules, masses of fibrosing lung diseases.

Learning objectives

- To appreciate the CT manifestations of pneumoconioses
- To come familiar with the differential diagnosis of pneumoconioses

NORMAL VARIANTS ON HRCT

S. Copley, London/UK

Teaching points

- The recognition of pathological disease versus physiological normal variants is crucial in radiological diagnosis
- There are several HRCT features (including ground glass opacity, air trapping and reticular pattern) which have been recognised in asymptomatic healthy subjects
- The appearances in normal older individuals (such as large airway abnormalities, a subpleural reticular pattern and cysts) will be highlighted

Learning objectives

- To learn about the HRCT features which may be present in asymptomatic healthy individuals
- To understand the possible pathological explanations for these appearances
- To recognise how normal variants on HRCT may mimic disease

References/Further Reading
1. Lee et al. Correlation of Aging and Smoking with Air Trapping at Thin-Section CT of the Lung in Asymptomatic Subjects. Radiology 2000;214:831-836
2. Tanaka et al. Air Trapping at CT: High Prevalence in Asymptomatic Subjects with Normal Pulmonary Function. Radiology 2003;227:776-785
3. SJ Copley, AU Wells, KE Hawtin, DJ Gibson, JM Hodson, AET Jacques and DM Hansell. Lung morphology in the elderly: a comparative CT study of subjects over 75 year old and those under 55 years of age. Radiology 2009;251:566-573

IMAGING EVALUATION AFTER IMMUNETHERAPY

H. Prosch, Vienna/AT

Description

Immunotherapies are used for more and more indications in lung cancer. For this reason, radiologists have to be aware of particular treatment responses and immune-related adverse events in patients who are undergoing treatment with immunotherapies. One particular form of treatment response we can observe in patients undergoing immunotherapy is the so called pseudoprogression, which is defined by a temporary increase in size of the tumor followed by a decrease in size. Pseudoprogression is explained by an infiltration of the tumor with inflammatory cells. Immuno-related adverse events (iAEs) such as pneumonitis, autoimmune colitis or endocrinopathies are of particular importance in immunotherapy. Autoimmune pneumonitis is one of the most commonly observed iAEs and may manifest as organizing pneumonia, sarcoid reaction, NSIP, exogenous allergic alveolitis or diffuse alveolar damage.

Learning objectives

- To appreciate the CT manifestations of immune-related adverse events
- To become familiar with treatment responses in immunotherapies

THORACIC TRAUMA IMAGING

A. Oikonomou, Toronto/CA

Description

Thoracic injury overall is the third most common cause of trauma following injury to the head and extremities. More specifically, penetrating thoracic injury is the cause of 4-15 % of admission to major trauma centres. Blunt and penetrating thoracic trauma has a high morbidity and mortality accounting for approximately 25 % of trauma-related deaths, second only to head trauma. More than 70 % of cases of blunt thoracic trauma are due to motor vehicle collisions with the remaining caused by falls or blows from blunt objects. Penetrating thoracic injury is mainly caused by knives and handgun bullets.

Mechanisms of injury are discussed and spectrum of abnormalities and radiologic findings encountered in blunt and penetrating thoracic trauma are categorized in injuries of pleural space (pneumothorax, hemothorax), lungs (pulmonary contusion, laceration, herniation), airways (tracheobronchial lacerations, Macklin effect), esophagus, heart, aorta and great vessels, diaphragm and chest wall (rib, scapular, sternal fractures and sternoclavicular dislocations). The possible coexistence of multiple types of injury in a single patient is stressed and therefore systematic exclusion after thorough investigation of all types of injury is warranted. Chest radiography plays an important role in the initial emergency work-up of the chest trauma patient, facilitating detection of tension pneumothorax, large-volume haemothorax, flail chest, or malpositioned instrumentation. Multidetector computed tomography (MDCT) has, however, established itself as the preferred imaging method for the evaluation of polytrauma patients allowing for significantly reduced scanning times to a few seconds allowing more time for post-diagnosis appropriate care. Finally, high-quality multiplanar and volumetric reformatted CT images greatly improve detection of injury and enhance the understanding of mechanisms of trauma-related abnormalities.

Learning objectives

- To discuss epidemiology, mortality - morbidity, significance, pathophysiologic features and mechanisms of injury in blunt chest trauma
- To discuss the typical radiologic findings as well as pitfalls associated with the wide spectrum of types of injury in the thorax, including injury of the lung parenchyma, trachea and airways, aorta (and aortic vessels), heart and pericardium, esophagus, pleura, diaphragm and thoracic wall. Possible coexistence of multiple types of injury is stressed
- To review the advantages and diagnostic impact of CT/MDCT for selected injuries over other modalities and discuss recommended imaging protocols and algorithms

LUNG INFECTIONS VIRAL/FUNGAL

A. Oikonomou, Toronto/CA

Description

Fungal and viral pulmonary infections mainly occur in immunocompromised patients and they are the major cause of morbidity and mortality in this population. The main categories of patients with immunodeficiency are HIV positive patients, hematopoietic stem cell transplant (HST) recipients, solid organ transplant recipients, patients under chemotherapy for hematologic and autoimmune diseases and mildly immunocompormised patients including heavy smokers, alcoholics, COPD or patients

with previous tuberculosis. At CD4 levels < 200, pneumocystis pneumonia (PCP) and disseminated tuberculosis are common. PCP occurs when CD4 levels are < 100 cells/mm^3. At this level of severe immunodeficiency CMV pneumonia, MAC disease and disseminated fungal infections are the most common. With CD4 levels > 500 cells/mm^3 patients are at risk from bacterial infections and tuberculosis.
Pulmonary infections post HST is subdivided in three phases: a) neutropenic phase: up to 3 weeks after transplantation including mainly fungal infections, invasive aspergillosis, RSV pneumonia and other noninfectious complications b) early post engraftment phase (31-100 days) predisposing the patient to CMV and RSV infections and c) late post engraftment phase (> 100 days) where immune status has recovered and pulmonary infections are uncommon in the absence of graft-versus-host disease.
The solid organ post-transplant period is subdivided into three phases: postoperative (0-30 days), early phase (1-6 months) and late (after the sixth month). CMV is the most prevalent virus affecting the respiratory tract in all solid organ transplant recipients. It emerges typically within the first three months after transplantation. Any form of invasive aspergillosis is very infrequent in solid organ transplant recipients although aspergillus species commonly colonize the airways of lung transplants recipients. Mildly immunosuppressive patients are highly susceptible to pulmonary infections which may be severe or fatal if left untreated.
In PCP HRCT demonstrates patchy perihilar ground-glass opacity with areas of intervening normal lung parenchyma. Occasionally a "crazy-paving" pattern is seen. Aspergillus infection may manifest with different types of involvement of the lungs and airways, namely bronchial invasive aspergillosis, aspergillus bronchopneumonia, obstructing bronchopulmonary aspergillosis, semiinvasive and angioinvasive aspergillosis with the characteristic pattern of nodules or mass surrounded by ground glass opacity (halo sign). CMV pneumonia in AIDS manifests as ground-glass opacities, dense consolidation and discrete pulmonary nodules or masses. CMV pneumonia in non-AIDS patients differs by the absence of very dense consolidation and masses.
Although usually fungal infections in the immunocompetent patients may be self-limited, there are some fungal infections such as histoplasmosis, coccidiomycosis and blastomycosis that can lead to severe pneumonitis or chronic pulmonary infection with distinct radiographic findings. New emerging viruses such as human metapneumovirus (hMPV), SARS-associated coronavirus and Avian influenza (H5N1), novel swine-origin influenza A (H1N1) have been diagnosed with an unpredictable impact on individual and health society.
Prompt diagnosis and treatment of pulmonary infections is essential. Radiologic pattern recognition with knowledge of the clinical setting and immune status of the patient is the best approach to pulmonary infectious processes.

Learning objectives

- To understand the various groups of immunocompromised patients mainly affected by fungal and viral infections and specific time points that these pulmoanry infections occur
- To review the etiology of most common fungal and viral infections in immunocompromised patients and become familiar with the different radiologic patterns
- To understand the most common fungal and emerging viral infections in immunocompetent patients and review the radiologic manifestations
- To understand the role of imaging in the diagnosis and follow up of fungal and viral infections

MRI OF THE LUNGS APPLICATIONS/FUTURE

A. Oikonomou, Toronto/CA

Description

MRI of the lungs has undergone the last fifteen years ground-breaking technological developments. Undoubtedly the biggest advantage of MRI has been the lack of ionizing radiation offering an alternative diagnostic modality to extreme ages such as women at child-bearing age and pediatric patients as well as in patients with allergy to iodinated contrast medium.
With major technological advances related to fast sequence and parallel imaging, gating and signal enhancement MRI has gained the unique ability of assessing lung function in addition to higher resolution of morphologic and anatomic imaging.
MRI has classically been the mainstay in the management of superior sulcus tumors, tumors where chest wall invasion is suspected and for further characterization of mediastinal tumors and pleural mesothelioma.
However MRI is increasingly gaining recognition in clinical practice in fields where CT used to be unbeatable such as diagnosis of pulmonary embolism, pulmonary arterial hypertension, staging of lung cancer, detection of early lung cancer and small pulmonary nodules, emphysema and airways disease such as cystic fibrosis.

Learning objectives

- To review the main clinical indications for which thoracic MRI is widely used
- To review the clinical indications and MRI findings for which thoracic MRI is increasingly used such as pulmonary embolism, lung cancer staging, detection of early lung cancer, emphysema and cystic fibrosis
- To review basic clinical MRI protocols for the most common clinical indications
- To understand the persisting limitations of thoracic MRI and anticipated future progress

ACCREDITATION

UEMS – CME ACCREDITATION

We are happy to announce that the ESTI Winter Course 2018, Tromsø, Norway, 06/12/2018-08/12/2018, has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) for a maximum of **12 European CME credits** (ECMEC®s).

Each medical specialist should claim only those credits that he/she actually spent in the educational activity.

The EACCME® is an institution of the European Union of Medical Specialists (UEMS), www.uems.eu. Through an agreement between the European Union of Medical Specialists and the American Medical Association, physicians may convert EACCME® credits to an equivalent number of AMA PRA Category 1 Credits™. Information on the process to convert EACCME® credits to AMA credits can be found at www.ama-assn.org/education/earn-credit-participation-international-activities.

Please find below the breakdown of ECMEC®s per day:

06.12.2018	3,00
07.12.2018	6,00
08.12.2018	3,00

NORWEGIAN MEDICAL ASSOCIATION ACCREDITATION

The course is accredited by the Norwegian Medical association with **15 credit hours** in postgraduate and continuing training for physicians in the speciality "Radiology".

DISCLOSURE STATEMENT

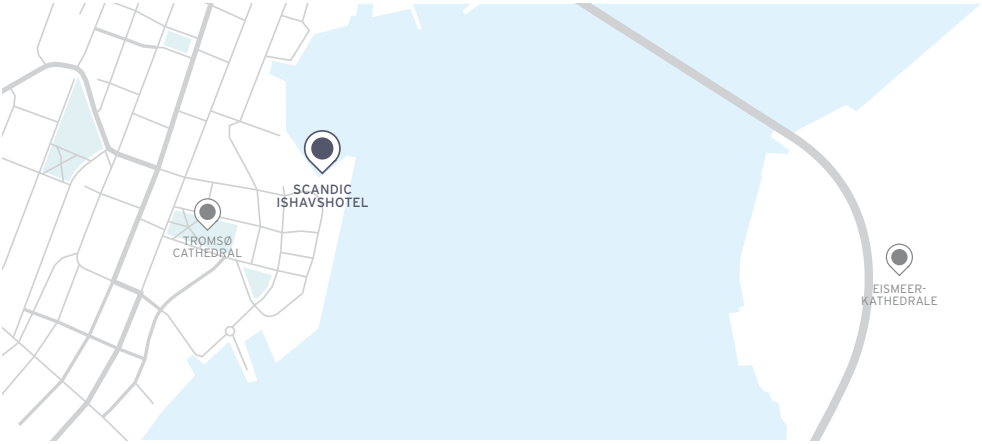
POTENTIAL CONFLICT OF INTEREST DISCLOSURES

It is the policy of ESTI (European Society of Thoracic Imaging) to ensure balance, independence, objectivity, and scientific rigour in the congress programme. Knowledge of possible relationships with sponsors of any kind is mandatory in order to reinforce the educational and scientific message and to relieve any suspicion of bias.
Any potential conflict of interest involving the organising committee should be made known so that the audience may form their own judgements about the presentation with a full disclosure of the facts. It is for the audience to determine whether the presenter's external interest may reflect a possible bias in either the work carried out or the conclusions presented.

The ESTI Winter Course 2018 Organiser, Dr. Anagha P. Parkar, did not disclose any relationships.

GENERAL INFORMATION

Course Venue
Scandic Ishavshotel
Fredrik Langesgate 2
NO-9008 Tromsø
Norway



Organising Secretariat
ESTI – European Society of Thoracic Imaging
Am Gestade 1
1010 Vienna, Austria
Phone: +43 1 5334064-900
Email: office@myESTI.org

Onsite Office
In case of any questions, kindly consult the registration desk, staff persons will be happy to assist you.

Registration Desk Opening Hours

Thursday, December 06	12:00-18:10
Friday, December 07	08:00-17:40
Saturday, December 08	08:30-13:00

Course Language

The course will be held in English. No simultaneous translation will be offered.

Registration fee for delegates includes

- admittance to all sessions
- admittance to the industry symposium
- congress programme including abstracts syllabus
- certificate of attendance
- coffee & lunch breaks

Mobile Phones

Please do not forget to switch off your mobile phones before entering the lecture room.

Breaks

Complimentary coffee, tea and refreshments will be served during the official coffee breaks to all meeting delegates. Lunch is offered during the lunch breaks.

Recording

Photo-, video- or audio-recording of any sessions or presentations is not allowed without the speaker's/organiser's prior written permission.

Future Meeting Desk

This area offers you an overview of future meetings in the field of radiology and related disciplines, from all over the world. Feel free to contribute flyers and posters to promote your own meetings and courses.

Onsite Payment

Onsite payment can only be made by credit card (Visa or Mastercard) or in cash (Euro). Please be informed that no other payment facilities such as debit cards, cheques, etc. will be accepted.

Certificate of Attendance

The Certificate of Attendance/CME Accreditation will be handed out at the registration desk on the last course day.

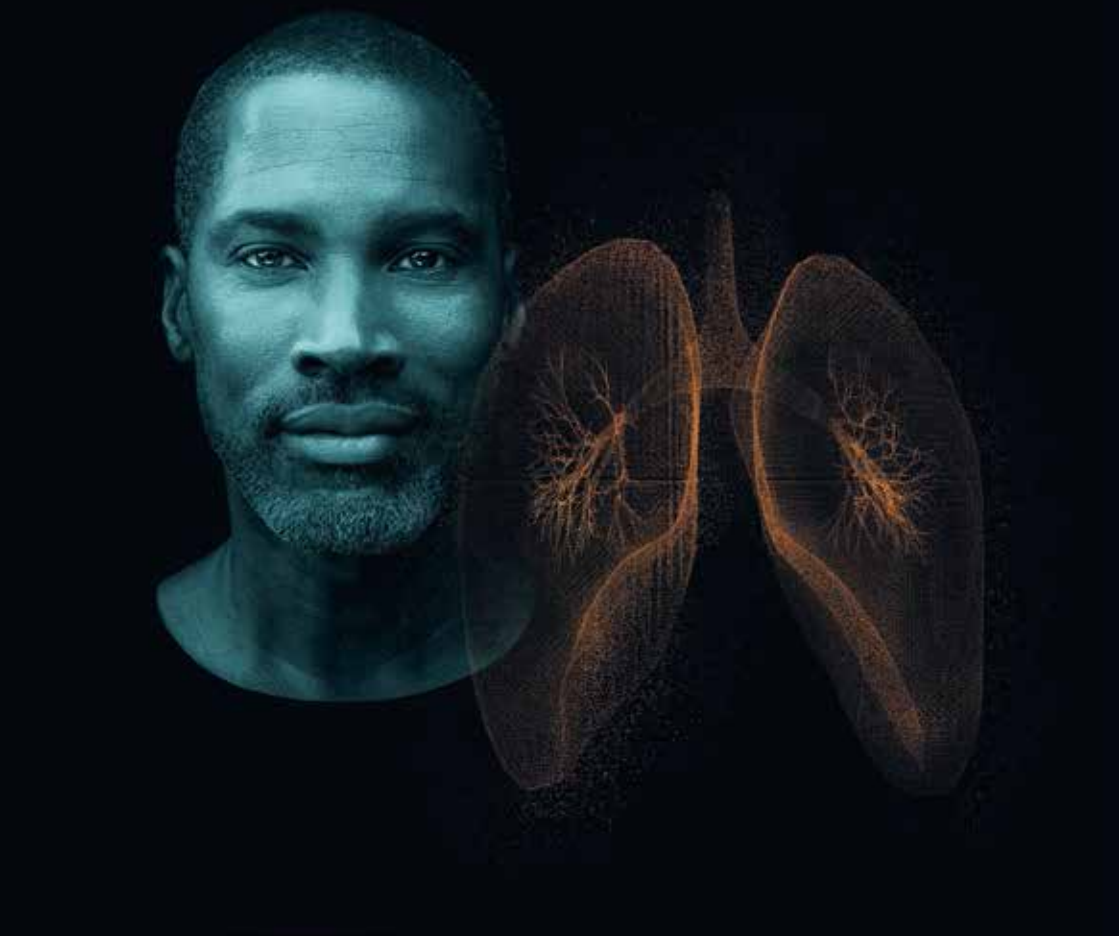
Safety

The safety of all congress delegates and participants is of utmost importance to ESTI. Security measures and precautions at the ESTI Winter Course venue have been tightened to ensure maximum security for all attendees. Badges must be worn visibly on the congress grounds at all time. ESTI reserves the right for staff to check participants' identification upon admission to and/or inside the course venue. Participants may at any time be requested to present adequate proof of identity in the form of a passport, driver's license, national or military identification or student ID. Documents for the proof of identity must include a photograph and signature.

Disclaimer/Liability

ESTI cannot accept any liability for the acts of the suppliers to this meeting or the attendees' safety while travelling to or from the course. All participants and accompanying persons are strongly advised to carry adequate travel and health insurance, as ESTI cannot accept liability for accidents or injuries that may occur. ESTI is not liable for personal injury and loss or damage of private property.

Shaping the future of healthcare



SIEMENS Healthineers

INDUSTRY SPONSORED LUNCH SYMPOSIUM

FRIDAY, DECEMBER 07, 12:10–13:10

Recent developments in Chest imaging

SIEMENS Healthineers

Artificial intelligence in chest reading – fiction or reality?
Prof.Dr. Michael Lell, Head of Radiology and Nuclear Medicine, Klinikum Nürnberg

Recent developments in lung cancer screening
Dr. Sebastian Schmidt, Siemens Healthineers, Computed Tomography

Lunch will be served after the symposium from 13:10-14:10.

SPONSOR

We thank our industry partner for their highly appreciated support of the first ESTI Winter Course 2018:

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2019
JOINT MEETING OF ESTI AND THE FLEISCHNER SOCIETY
MAY 09-11, 2019
PARIS, FRANCE
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