THE ROLE OF MSCT IN EVALUATION OF THORACIC MANIFESTATIONS OF SYSTEMIC LUPUS ERYTHEMATOSUS

Thesis

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Abstract

SLE is a chronic autoimmune disease that can affect many systems with high incidence of thoracic manifestations. MSCT is currently the imaging modality of choice in diagnosis of thoracic manifestations of SLE, being accurate and noninvasive.

Using different techniques of MSCT, it detected wide spectrum of thoracic manifestations including pleuropulmonary, cardiological and vascular involvement.

Key words:

SLE - Thoracic manifestations – MSCT - Accurate and noninvasive - Modality of choice.

List of abbreviations

ACR	American College of Rheumatology.
ALP	Acute lupus Pneumonitis.
APS	Anti- Phospholipid anti-body Syndrome.
AVN	Avascular Necrosis.
BO	Bronchiolitis Obliterans.
CECT	Contrast Enhanced Computerized Tomography.
CHF	Congestive Heart Failure.
CIP	Chronic Interstitial Pneumonitis.
CMV	CytoMegalo Virus.
CT	Computerized Tomography.
CTPA	Computerized Tomography Pulmonary Angiography.
DAH	Diffuse Alveolar Hemorrhage.
DLE	Discoid lupus erythematosus.
FOV	Field Of View.
HRCT	High Resolution Computerized Tomography.
HU	Housefield Unit.
ILD	Interstitial Lung Disease.
IVC	Inferior Vena Cava.
Kv	Kilo volt
mA	milli Ampere.
MIP	Maximum Intensity Projection.
MinIP	Minimum Intensity Projection.
MRI	Magnetic Resonance Imaging.
MSCT	Multi-Slice Computerized Tomography.
NCECT	Non- Contrast Enhanced Computerized Tomography.
NSAIDs	Non -Steroidal Anti-Inflammatory Drugs.
NSIP	Non Specific Interstitial Pneumonia.
PA	Posterior-Anterior view.
PE	Pulmonary embolism.
PFTs	Pulmonary Function Tests.
PHT	Pulmonary Hypertension.
SLE	Systemic Lupus Erythematosus.
SLS	Shrinking Lung Syndrome.
UIP	Unusual Interstitial Pneumonia.
WL	Window Level.
WW	Window Width.

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INTRODUCTION

Systemic Lupus Erythematosus (SLE) is a chronic, auto-immune collagen disease of unknown cause where the patient's body makes large quantities of anti-bodies that react against the person's own tissues. The incidence is approximately 20-50 cases per 10^5 population per annum and the prevalence is 124/100,000. The crude incidence rate is 3 times higher for African-American women than for European-American women. It is 10 times more prevalent in women than in men **(Renau and isenberg, 2012)**.

Lupus is the Latin word for wolf. **Erythematosus** means red rashes.
In 1851, Dr. Cazenave discovered red rashes on a patient's face that looked like wolf bites. He named the rash Discoid Lupus Erythematosus (DLE).
In 1885, Sir William Osler recognized that many people with lupus had a disease involving not only the skin but many other organs or systems. He named the disease Systemic Lupus Erythematosus (SLE) **(Bauer et al., 2006).**

SLE can affect almost any organ system; thus, its presentation and course are highly variable, ranging from indolent to fulminant. Up to 50% of SLE patients experience lung involvement during their disease course which may manifest acutely or indolently **(Mittoo and Fell, 2014).**

Lung disorders are classified as primary (due to lupus) and secondary to other conditions. Pleuritis and pulmonary infections are the most prevalent respiratory manifestations of each type. Other infrequent manifestations include acute lupus pneumonitis, diffuse alveolar hemorrhage, pulmonary

arterial hypertension, acute reversible hypoxemia and shrinking lung syndrome **(Pego-Reigosa et al., 2009).**

Knowledge of the main chest imaging findings and understanding of the major associated complications are crucial for adequate disease management ***(*Capobianco et al., *2012).***

However, the chest radiograph has its limitations. It is normal in 10 to 15 percent of symptomatic patients with proven infiltrative lung disease, up to 30 percent of those with bronchiectasis, and close to 60 percent of patients with emphysema **(Epler et al., 1978).**

MSCT is the method of choice for assessment of pulmonary abnormalities in SLE, offering the best correlation with histologic findings, disease severity, prognosis, evaluation of disease progression, and differential diagnosis ***(*Capobianco et al., *2012).***

HRCT, which has a sensitivity of 95 percent and a specificity approaching 100 percent. It can often provide more information than either chest radiography or conventional CT scanning. A confident diagnosis is possible in roughly one-half of cases, and these are proven correct an estimated 93 percent of the time **(Müller, 1991).**

AIM OF WORK

The aim of this study is to evaluate the MSCT findings in patients with thoracic manifestations of SLE.

Systemic Lupus Erythematosus

Systemic Lupus Erythematosus (SLE) is a multisystem auto-immune collagen vascular disease of unknown cause where the patient's body makes large quantities of anti-bodies that react against the person's own tissues **(Tsokos, 2011).**

Epidemiology:

The overall prevalence rate of SLE is about 20-50 cases per 10^5 population. The crude incidence rate is 3 times higher for African-American women than for European-American women. It is 10 times more prevalent in women than in men **(Renau and Isenberg, 2012).**

Pathogenesis:

The exact patho-aetiology of systemic lupus erythematosus (SLE) remains elusive. An extremely complicated and multifactorial interaction among various genetic and environmental factors is probably involved **(Mok and Lau, 2003).**

It is important to note that antibodies may be present for many years before the onset of the first symptoms of SLE **(Hahn et al., 2005).**

Clinical Presentation

Systemic lupus erythematosus can affect almost any organ system. Its presentation and course are highly variable, ranging from indolent to fulminant **(Tsokos, 2011).**

Patients may present with any of the following types of manifestations:

A-Thoracic manifestations of SLE

Lung involvement is a known complication of SLE and of its treatments. Up to 50% of SLE patients experience thoracic involvement during their disease course which may manifest either acutely or indolently **(Mittoo et al., 2014).**

Two major themes are responsible for SLE-associated pulmonary manifestations: first is the presence of specific autoantibodies and second is vascular injury **(Mittoo et al., 2014).**

Pleuropulmonary manifestations include:

- **Pleuritis** is found in 40-60% of patients with SLE and it is the most common pleuropulmonary manifestation. It may be the presenting feature with pleuritic chest pain **(Torre and Harari, 2011).**

The Pleuritis is dry in 50% of cases, but in the other 50% of cases it is accompanied by pleural effusion **(Torre and Harari, 2011).**

- **Pleural effusion** usually small or moderate in size. Unilateral and bilateral effusions are found with equal frequency **(Weidemann and Matthay, 1998).**

It is important to exclude other causes for pleural effusion in SLE, including nephrotic syndrome, cardiac and renal failure, pulmonary embolism and infective Pneumonia **(Weidemann and Matthay, 1998).**

- **Acute lupus pneumonitis (ALP)** is an unusual life-threatening condition characterized by acute onset of fever, cough, tachypnea, hypoxia, and radiologic consolidation. Clinically it resembles infective pneumonia, pulmonary infarction,