



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



MONA MAGHRABY



Role of Nail Fold Capillaroscopy as A Method of Early Detection of Atherosclerosis in Systemic Lupus Erythematosus Patients

Thesis

*Submitted For Partial Fulfillment of Master Degree
in Rheumatology*

By

Huda Taha Hussein

M.B.B.Ch

Under Supervision of

Prof. Dr. Hanan Mohamed Farouk

*Professor of Internal Medicine and Rheumatology
Faculty of Medicine - Ain Shams University*

Dr. Rasha Mahmoud Mohamed

*Lecturer of Internal Medicine and Rheumatology
Faculty of medicine-Ain Shams University*

Dr. Fatma Mohammad Aboud

*Lecturer of Internal Medicine and Rheumatology
Faculty of medicine-Ain Shams University*

*Faculty of Medicine
Ain Shams University
2020*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ نَارُ سَجَانِيكَ لَا حِلَّ لَنَا إِلَّا بِاللَّهِ

عَلَّمَنَا أَنْتَ أَنْتَ الْعَالِمُ الْحَكِيمُ

صدق الله العظيم
سورة البقرة
آية رقم: (٢٢٢)

Acknowledgment

In the name of Allah, I would like to begin by confessing that all the favor and thanks to Allah who empowered me and gave me strength to complete this work.

I am profoundly grateful to Prof. Dr. Hanan Farouk, Professor of Internal medicine and Rheumatology and Immunology at Faculty of Medicine –Ain Shams University for her valuable help and fruitful support step by step till this thesis is finished.

My deep appreciation to Dr. Rasha Mahmoud, Lecturer Internal Medicine and Rheumatology- Ain Shams University for her useful advice and continuous guidance throughout the thesis

I would like to express my deep appreciation, sincere and profound thanks to Dr. Fatma Aboud, Lecturer of Internal Medicine and Rheumatology – Ain shams university for being my mentor and being always supportive and full of positive energy.

I would like to express my deepest appreciation and gratitude to my mom and dad for their extreme support in my life, Family and for being the greatest mom and dad someone can have.

And finally my biggest thanks to my Husband and my special daughters for always being by my side, giving me strength to be in the best Form and being the best Husband and daughters.

At last, my deep thanks to the subjects accepting participation in the study.

 **Dr. Huda Taha**

List of Contents

Title	Page No.
List of Tables	i
List of Figures	iii
List of Abbreviations.....	vii
Introduction	1
Aim of the Work.....	4
Review of Literature	
Systemic Lupus Erythematosus	5
Nail Fold Capillaroscopy.....	56
Atherosclerosis in Systemic Lupus Erythematosus	74
Patients and Methods.....	84
Results	90
Discussion	117
Summary	126
Conclusion	128
Recommendations	129
References	130
Arabic Summary	—

List of Tables

Table No.	Title	Page No.
Table (1):	Showing the frequency of the clinical presentations of SLE at the disease onset and at any point of the disease.....	17
Table (2):	Representing the ACR nomenclature and case definitions for neuropsychiatric lupus syndromes.....	22
Table (3):	Definition of SLE classification criteria	28
Table (4):	Showing the different components of SLEDAI score	35
Table (5):	Describing the normal capillaroscopic pattern	62
Table (6):	Atherosclerotic risk factors in systemic lupus erythematosus. Traditional and non-traditional.....	79
Table (7):	Demographic characteristics of the studied patients.	90
Table (8):	Disease activity among the studied patients.	90
Table (9):	Laboratory findings among the studied patients.	91
Table (10):	Nail fold capillaroscopy findings among the studied patients.	92
Table (11):	Carotid artery findings among the studied cases.....	95
Table (12):	Comparison between atherosclerotic and non-atherosclerotic patients regarding demographic characteristics.	96
Table (13):	Comparison between atherosclerotic and non-atherosclerotic patients regarding the disease activity.	97

List of Tables Cont...

Table No.	Title	Page No.
Table (14):	Comparison between atherosclerotic and non-atherosclerotic patients regarding laboratory findings.	99
Table (15):	Comparison between atherosclerotic and non-atherosclerotic patients regarding the nail fold capillaroscopy findings.	101
Table (16):	Correlation between the IM thickness and capillaroscopic findings& diseases activity among the studied patients.....	106
Table (17):	Relation according to capillaroscopy findings regarding carotid IM thickness (mm).	110
Table (18):	Diagnostic performance of nail fold capillaroscopy in diagnosing atherosclerosis in our SLE patients:.....	114
Table (19):	Diagnostic characteristics of nail fold capillaroscopy in diagnosing atherosclerosis. ...	114

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Showing the different etiologies of SLE.....	8
Figure (2):	Showing the pathophysiology of the SLE.....	9
Figure (3):	Classification criteria for systemic lupus erythematosus	31
Figure (4):	Highlights EULAR 2019 recommendations for treating non-renal SLE	45
Figure (5):	Normal nailfold capillaries	58
Figure (6):	The different techniques for performing nailfold capillaroscopy	60
Figure (7):	Abnormal capillary shapes	65
Figure (8):	Avascular areas, demonstrating areas of capillary drop-out”	67
Figure (9):	Nailfold capillaroscopy showing a normal pattern.....	68
Figure (10):	Nailfold capillaroscopy image shows progressively worsening damage.....	69
Figure (11):	Describes Foam cell formation. LDL particles (blue) become oxidized in the vascular wall	80
Figure (12):	Describes the mechanisms leading to atherogenesis and cardiovascular disease in SLE patients.....	83
Figure (13):	Disease activity among the studied patients.....	91
Figure (14):	Nail fold capillaroscopy shapes abnormalities among the studied cases.....	93
Figure (15):	Nail fold capillaroscopic hemorrhage among the studied cases.....	93

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (16):	Nail fold capillaroscopy subpapillary Plexus among the studied cases.	94
Figure (17):	Nail fold capillaroscopy distribution among the studied cases.....	94
Figure (18):	Atherosclerosis among the studied patients.....	95
Figure (19):	Comparison according to atherosclerosis regarding SLEDAI score.	98
Figure (20):	Comparison according to atherosclerosis regarding clinical severity.	98
Figure (21):	Comparison according to atherosclerosis regarding LDL	100
Figure (22):	Comparison according to atherosclerosis regarding ESR.	100
Figure (23):	Comparison according to atherosclerosis regarding Capillary density.....	102
Figure (24):	Comparison according to atherosclerosis regarding length.....	103
Figure (25):	Comparison according to atherosclerosis regarding arterial limb diameter.	103
Figure (26):	Comparison according to atherosclerosis regarding nail fold shape abnormalities.....	104
Figure (27):	Nail fold capillaroscopy hemorrhage among the studied cases.....	104
Figure (28):	Nail fold capillaroscopy subpapillary plexus among the studied cases.	105
Figure (29):	Comparison according to atherosclerosis regarding nail fold capillaroscopy disorganized distribution.	105

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (30):	Correlation between IM thickness and SLEDAI score.....	107
Figure (31):	Correlation between IM thickness and density	107
Figure (32):	Correlation between IM thickness and length.....	108
Figure (33):	Correlation between IM thickness and width	108
Figure (34):	Correlation between IM thickness and arterial limb diameter.....	109
Figure (35):	Relation between capillaroscopy findings (distribution) regarding carotid IM thickness	111
Figure (36):	Relation between capillaroscopy findings (hemorrhage) regarding carotid IM thickness	111
Figure (37):	Relation of capillaroscopy findings (corkscrew) regarding carotid IM thickness	112
Figure (38):	Relation of capillaroscopy findings (meandering) regarding carotid IM thickness	112
Figure (39):	Relation of capillaroscopy findings (tortuous) regarding carotid IM thickness	113
Figure (40):	Relation of capillaroscopy findings (subpapillary plexus) regarding carotid IM thickness	113
Figure (41):	ROC curve for nail fold capillaroscopy in diagnosing atherosclerosis.	114

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (42):	Diagnostic characteristics of Arterial loop diameter $\geq 17.0 \mu\text{m}$ in diagnosing atherosclerosis.	116
Figure (42):	Derived from real cases in this study and showing: (a) Normal capillaroscopic findings. (b) Meandering and budding of capillaries. (c) Microhemorrhages abnormal distribution of capillaries. (d) Tortuous and meandering capillaries.	117

List of Abbreviations

Abb.	Full term
ABC	ATP binding cassette transporter
AIHA	Autoimmune haemolytic anaemia
ANA	Antinuclear antibodies
anti-dsDNA	Anti-double-stranded DNA antibodies
APCs	Antigen presenting cells
aPL	Anti phospholipid antibodies
APLA	Antiphospholipid antibodies
APS	Antiphospholipid syndrome
ASCVD	Atherosclerotic cardiovascular disease
AZA.....	Azathioprine
BILAG	British Isles Lupus Assessment Group
BLyS.....	B lymphocyte stimulator
CAC	Coronary artery calcium
CHD.....	Coronary heart disease
cIMT	Carotid intima media thickness
CLE.....	Cutaneous lupus erythematosus
CMV.....	Cytomegalovirus
CNS	Central nervous system
CRP.....	C-reactive protein
CTD	Connective tissue
CVD	Cardiovascular disease
CYC	Cyclophosphamide
DLE	Discoid lupus erythematosus
ds-DNA.....	Anti-double stranded DNA
EBV	Epstein Barr virus
ECLAM.....	European Consensus Lupus Activity Measure
ECs	Endothelial cells
GC.....	Glucocorticoids
GI.....	Gastrointestinal

List of Abbreviations Cont...

Abb.	Full term
GWAS.....	Genome-wide association studies
HCQ.....	Hydroxychloroquine
IDL.....	Interstitial Lung disease
IFN	Interferon
IL	Interleukin
IMT	Intima-media thickness
IS	Immunosuppressive
IUGR	Intrauterine growth restriction
IVIG.....	Intravenous immunoglobulin
LAI.....	Lupus Activity Index
MI	Myocardial infarction
MMF	Mycophenolate mofetil
MP	Methyl prednisolone
MTX.....	Methotrexate
NFC	Nail fold capillaroscopy
NICE.....	National Institute of Clinical Excellence
NK	Natural killer
NOAC	Novel oral anticoagulants
NPSLE.....	Neuropsychiatric systemic lupus erythematosus syndromes
PBMCs.....	Peripheral blood mononuclear cells
PNS.....	Peripheral nervous system
PWV.....	Pulse wave velocity
RA.....	Rheumatoid arthritis
RCTS	Randomized controls trials
RTX.....	Rituximab
SCLE	Subacute cutaneous lupus erythematosus
SIS	SLE Index Score
SLAM.....	Systemic Lupus Activity Measure