Role of Neck Imaging Reporting and Data System (NI-RADS) in the Prediction of local and Regional Recurrence of Head and Neck Squamous Cell Carcinoma by Cross Sectional Imaging Modalities

Thesis

Submitted for Partial Fulfillment of M.D. Degree in Radiology

Presented by

Manar Maamoun Mohamed Ashour

M.B., B. Ch., M. Sc.
Faculty of Medicine, Ain Shams University

Supervised By

Prof. Dr. Hanaa Abdel Kader Abdel Hameed

Professor of Radiodiagnosis
Faculty of Medicine - Ain Shams University

Prof. Dr. Zeinab Mohammed Abdel Hafeez

Professor of Clinical Oncology and Nuclear Medicine
Faculty of Medicine - Ain Shams University

Assistant Prof. Dr. Togan Taha Abdel Aziz

Assistant Professor of Radiodiagnosis
Faculty of Medicine - Ain Shams University

Dr. Ahmed Samy Abdelrahman

Lecturer of Radiodiagnosis
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
2019

سورة البقرة الآية: ٣٢

*First and foremost, thanks to **Allah**, the most Beneficent and Merciful.*

*Thanks to Prof. **Dr. Hanaa Abdel Kader Abdel Hameed**, Professor of Radiodiagnosis, Faculty of medicine-Ain Shams University, for giving me the honor to work under her supervision, judicious guidance and kind support at this study.*

*I wish to express my great thanks to **Prof. Dr. Zeinab Mohammed Abdel Hafeez**, Professor of clinical Oncology, Faculty of medicine-Ain Shams University, for her kind care, constant help and great assistance throughout this work.*

*My deep appreciation and thanks to **Dr. Togan Taha Abdel Aziz,** Assistant Prof. of Radiodiagnosis, Faculty of medicine-Ain Shams University, for suggesting this topic, and for her keen guidance, and continuous kind encouragement, which made the completion of this work possible.*

*My deep appreciation to **Dr. Ahmad Samy Abdelrahman,** Lecturer of Radiodiagnosis, Faculty of medicine-Ain Shams University, for his sincere guidance and effort during this study.*

*I am grateful to all **my brave patients**, for their kind acceptance to be included in this study.*

*I am indebted to **my parents**, my family, my friends and my colleagues for their endless and continuous help, support and prayers.*

Manar Maamoun Ashour

List of Contents

List of Abbreviations

Abb.	Full term

2D ..... Two dimensions
3D ..... Three dimensions
ACR..... American College of Radiology
ADC ..... Apparent diffusion coefficient
AJCC..... American Joint Committee on Cancer
ALT FF ..... Anterolateral thigh Fasciocutaneous flap
ASL ..... Arterial spin labelling
BIRADS ..... Breast Imaging Reporting and Data System
BOLD..... Blood oxygen level–dependent
C6..... The sixth cervical vertebra
Cho ..... Choline
Cho-to-Cr..... Choline to creatine ratio
CN IX ..... Glossopharyngeal nerve
CN V..... Trigeminal nerve
CN VII ..... Facial nerve
CN X ..... Vagus nerve
CN XI ..... Spinal accessory nerve
CN XII..... Hypoglossal
CNS ..... Central nervous system
COMMANDO ..... Combined mandibulotomy and neck dissection operation
Cr ..... Creatine
CRTH ..... Chemo-radiotherapy
CSs ..... Carotid spaces
CT..... Computed tomography
D..... True diffusion coefficient
D*..... Pseudo-diffusion coefficient
DCE..... Dynamic contrast-enhanced
EES..... Extracellular extravascular space receptor
EGFR ..... Epidermal growth factor receptor
EORTC ..... European Organization for Research and Treatment of Cancer
f..... the vascularity volume fraction
FDG..... 18F-fluorodeoxyglucose

List of Abbreviations Cont…

Abb.	Full term

FFE..... Fast field echo
FN ..... False negative
FOM..... Floor of mouth
FOV..... Field of view
FP..... False positive
FSE..... Fast spin echo
GFR..... Glomerular filtration rate
Gln ..... Glutamine
Glu ..... Glutamate
H&N..... Head and neck
HGF ..... Hepatocyte growth factor
HNSCC..... Head and neck squamous cell carcinoma
HPV ..... Human papillomavirus
IHN ..... Infra-hyoid neck
IVIM ..... Intravoxel incoherent motion
Kep..... The rate constant between EES and blood plasma
Ktrans ..... The volume transfer constant between blood plasma and EES
LNs ..... Lymph-nodes
MET..... The receptor for hepatocyte growth factor
MRI..... Magnetic resonance imaging
MRS..... MR spectroscopy
MS..... Masticator space
NAA ..... N-acetylaspartate
NIRADS ..... Neck Imaging Reporting and Data System
NOTCH1..... A human gene encoding a single-pass transmembrane receptor
NPC..... Nasopharyngeal carcinoma
PACS..... Picture archiving and communication system
PERCIST..... PET Response Evaluation Criteria in Solid Tumors criteria
PET..... Positron emission tomography

List of Abbreviations Cont…

Abb.	Full term
PET-CT	Positron emission tomography-computed tomography
PET-MRI	Positron emission tomography- magnetic resonance imaging
PMS	The pharyngeal mucosal space
PNS	Perineural spread
PPF	The pterygopalatine fossa
PPG	The pterygopalatine ganglion
PPM	Part per million
PPS	The parapharyngeal space
PRESS	Pointed-resolved spectroscopy
PS	Parotid space
PVS	Peri-vertebral space
R2* (1/T2)	The rate of transverse relaxation
RB	The retinoblastoma pathway
RMT	Retromolar trigone
ROI	Region of interest
RPLN	Retropharyngeal lymph-node
RPS	Retropharyngeal space
RTH	Radiotherapy
SCC	Squamous cell carcinoma
SE	Spin echo
SHN	Supra-hyoid neck
SMS	Submandibular space

List of Tables

List of Tables Cont...

List of Tables Cont...

List of Tables Cont…

List of Tables Cont...

List of Figures

List of Figures Cont...

List of Figures Cont...