SYSTEMIC CHEMOTHERAPY AND LIMITED CONVENTIONAL EXTERNAL BEAM IRRADIATION FOLLOWED BY INTERSTITIAL BRACHYTHERAPY IMPLANT BOOST IN TREATMENT OF ADVANCED CANCER OF THE HEAD AND NECK

THESIS SUBMITTED FOR PARTIAL FULFILLMENT OF
M.D. DEGREE IN RADIOTHERAPY AND NUCLEAR MEDICINE

BY
EHAB MOSTAFA MOHAMED
M.B., B. CH., M.S.

UNDER SUPERVISION
OF

Prof. DR. SALWA MASSOUD IBRAHIM

PROF. OF RADIATION ONCOLOGY AND NUCLEAR MEDICINE
FACULTY OF MEDICINE-AIN SHAMS UNIVERSITY.

Prof. DR. A.M. NISAR SYED

CLINICAL PROF. OF RADIATION ONCOLOGY
MEMORIAL CANCER INSTITUTE
SCHOOL OF MEDICINE- UNIVERSITY OF CALIFORNIA-IRVINE

Prof. DR. SAMI AHMED EL-BADAWI

PROF. OF RADIATION ONCOLOGY
NATIONAL CANCER INSTITUE
CAIRO UNIVERSITY.

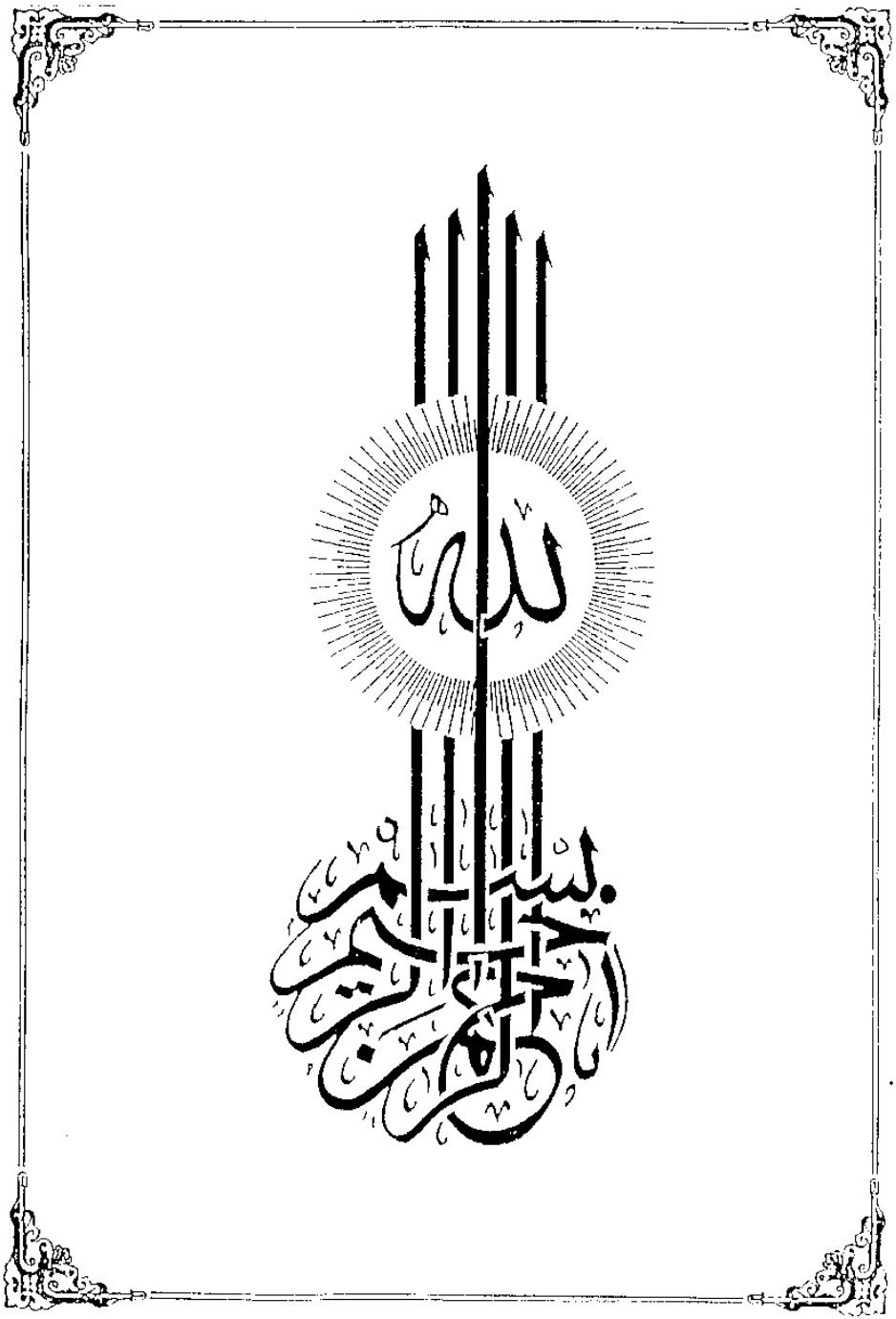
Prof. DR. MOHAMED OSMAN EL-KAHKY

PROF. OF OTORHINO LARYNGOLOGY
FACULTY OF MEDICINE-AIN SHAMS UNIVERSITY.

DR. SOHEIR SYED ISMAIL

ASSISTANT .PROF. OF RADIATION ONCOLOGY AND NUCLEAR MEDICINE
FACULTY OF MEDICINE-AIN SHAMS UNIVERSITY.

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY
1998



Contents

List of Tables:

List of Figures

Dedication

To my parents, who saved no effort ,money or support to make my life more comfortable and productive , even on the expense of their own happiness.

To my wife, Maha, who started with me the new trip to the future , helped me with all possible means to pass through any hard times ,and to my joy of life my daughters , Nadene and Lina whose smiles open all the doors of the future.

Acknowledgment

Before all thanks to ALLAH the most compassionate , the most merciful,

I would like to express my profound gratitude and great respect to Dr. Salwa Massoud Ibrahim, Prof. of Radiation Oncology and Nuclear Medicine ,Faculty of Medicine ,Ain Shams University. I owe what words can't express for her meticulous supervision and sincere cooperation. It was an honor to me to carry out this work under her continuous guidance and expert supervision. I learned a lot both paractically and scientifically from her ,such support is never to be forgotten.

I greatly indebted to Dr. AM Nisar Syed, Clinical Professor of Radiation Oncology, Memorial Medical Center, Long beach, California and University of California , Irvine, for his unlimited help ,precise instructions and kind encouragement during my stay in united state of America.

I wish to express my gratitude to Dr. Sami Ahmed EL-Badawi, Prof. of Radiation Oncology, National Cancer Institute, Cairo University, for his great help and guidance.

I wish to express my gratitude to Dr. Mohamed AL-Kaiky Prof. of ENT , Faculty of Medicine ,Ain Shams University, for his great help and guidance.

I would like to express my profound gratitude to Dr.Soheir Syed Ismail , Assist. Prof. of Radiation Oncology and Nuclear Medicine ,Faculty of Medicine ,Ain Shams University, for her valuable instructions and close supervision.

Last but not Least , I would to thank all my professors and colleagues in Radiation Oncology Department in Faculty of Medicine ,Ain Shams University and in Memorial Medical Center, Long beach, California for their warm advise and fruitful suggestions printed on each page of this work.

Introduction

The term "head and neck cancer" generally refers to those malignancies arise from the surface epithelium of the upper aerodigestive tract. Squamous cell carcinoma, or its variants, is the histologic type in 95% of these cases(SCHNC) . At diagnosis, two third of the patients presents initially with local disease have locally advanced disease(T3,T4andN1-N3).. Distant metastatic disease is found in less than 10% of the cases at diagnosis but up to 25%will die with distant metastasis and autopsy series show an incidence of 40%-50% .Treatment options for locoregionally advanced disease remain unsatisfactory. Surgery and/or radiation have long been considered standard therapies ,yet the majority of these patients die of locoregional recurrence and a smaller fraction dies of distant metastases.

Surgery alone prvides a 5 year locoregional control rate of 25% and an overall survival rates of 17%-29% . Most of these patients also receive adjuvant postoperative radiotherapy especially those with stage IV disease, nodal involvement and those with positive surgical margins . Despite these aggressive and often deforming therapeutic interventions , the over all results in these patients are poor, more than 60% of cancers recur locoregionally, approximately 20% of patients develop distant metastsis and 70% die within 5 years. Even considering the 30% of patient alive at 5year, not all are free from the disease .Radiotherapy alone is commonly used for patient with inoperable and /or unresectable stage III or IV disease . However it remains highly palliative. With radiation therapy alone , the local control rate achieved in these patients approaches 50% depending on tumor size , nodal involvement and the site of primary tumor , but the recurrence rate is high. The 5year locoregional control rate is ppproximately 15%, 5 year survival rate doesnot exceed 20% and the median survival time is 12 months. This is mainly due to the insufficient radiation dose that can be delivered to the tumor because of the tolerence of the surrounding normal tissues. Also, therapies of locally advanced head and neck cancers are often associated with considerable morbidity in the form of sever deformities, impaired speech and swallowing , osteoradionecrosis , mucositis , impaired nutrition , disturbed body image and a high suicide rate

Given these unsatisfactory results, investigation of new approaches for improving local regional control is justified. Several different radiation strategies have been used in attempts to improve the therapeutic ratio.These include accelerated fractionation(AFRT) and hyperfractionation(HFRT).Early in 1980s new combinations

,essentially cisplatin - 5 fluroracil(5FU) with very high primary tumor and lymph node response rates , led to a re-evaluation of the role of chemotherapy in the treatment of locally advanced head and neck cancer.

Aim of the work:

With introduction of chemotherapy early in the treatnent followed by limited external conventional photon irradiation then interstitial Iridiun-192 implant to facilitate the delivery of a high dose of radiation (up to 90 Gy) to the tumor and spare the surrounding normal tissues have been investigated with the goals of improved survival , improved local control , reduction of distant metastasis and organ preservation with subsequent retention of important functions such as speech and swallowing by avoiding extensive deforming surgery. These advantages offer patients the potential for better quality of life , even if the survival duration is not significantly altered by chemoradiotherapy compared with traditional therapies.