ROLE OF RADIOFREQUENCY ABLATION IN THE TREATMENT OF BREAST CANCER LESIONS

ESSAY
SUBMITTED FOR PARTIAL FULFILLMENT FOR THE MASTER DEGREE IN RADIODIAGNOSIS

By
Amal Ibrahim Hasan Hadhoud
M.B B.CH
Ain Shams University

Supervised By
Prof. Dr. Salwa Taha Ahmad Ismaeel
Professor of Radiodiagnosis
Faculty of Medicine
Ain shams University

Ass. Prof. Dr. Samer Malak Botros
Assistant professor of Radiodiagnosis
Faculty of Medicine
Ain shams University

Faculty of Medicine
Ain shams University
2010

"وأنزل الله عليك الكتاب والحكمة

و علمك ما لم تكن تعلم

و كان فضل الله عليك عظيما"

ACKNOWLEDGEMENT

I wish to express my sincere appreciation and greatest gratitude to *Prof. Dr*. ***Salwa Taha Ahmad Ismaeel***, *Prof. of Radiodiagnosis, Radiology Department, Faculty of Medicine, Ain Shams University* for her generous advice and support during this work.

My thanks also expressed to *Ass. Prof. Dr*. ***Samer Malak Botros***, *Ass. Prof. of Radiodiagnosis, Radiology Department, Faculty of Medicine, Ain Shams University* for his remarkable effort and great support through out this work.

I am grateful to all members of my family for their help, cooperation and unlimited encouragement especially my husband for his valuable guidance & support.

Before and above all I wish to express my thanks to **ALLAH "Azz wa Gel".**

CONTENTS

LIST OF FIGURES

ROLE OF RADIOFREQUENCY ABLATION IN THE TREATMENT OF BREAST CANCER LESIONS

ESSAY
SUBMITTED FOR PARTIAL FULFILLMENT FOR THE MASTER DEGREE IN RADIODIAGNOSIS

By
Amal Ibrahim Hasan Hadhoud
M.B B.CH
Ain Shams University

Supervised By
Prof. Dr. Salwa Taha Ahmad Ismaeel
Professor of Radiodiagnosis
Faculty of Medicine
Ain shams University

Ass. Prof. Dr. Samer Malak Botros
Assistant professor of Radiodiagnosis
Faculty of Medicine
Ain shams University

Faculty of Medicine
Ain shams University
2010

"وأنزل الله عليك الكتاب والحكمة

و علمك ما لم تكن تعلم

و كان فضل الله عليك عظيما"

ACKNOWLEDGEMENT

I wish to express my sincere appreciation and greatest gratitude to *Prof. Dr*. ***Salwa Taha Ahmad Ismaeel***, *Prof. of Radiodiagnosis, Radiology Department, Faculty of Medicine, Ain Shams University* for her generous advice and support during this work.

My thanks also expressed to *Ass. Prof. Dr*. ***Samer Malak Botros***, *Ass. Prof. of Radiodiagnosis, Radiology Department, Faculty of Medicine, Ain Shams University* for his remarkable effort and great support through out this work.

I am grateful to all members of my family for their help, cooperation and unlimited encouragement especially my husband for his valuable guidance & support.

Before and above all I wish to express my thanks to **ALLAH "Azz wa Gel".**

CONTENTS

LIST OF FIGURES

INTRODUCTION

Breast cancer is a cancer that starts in the breast, usually in the inner lining of the milk ducts or lobules. There are different types of breast cancer, with different stages (spread), aggressiveness, and genetic makeup. With best treatment, 10-year disease-free survival varies from 98% to 10%. Treatment includes surgery, drugs (hormone therapy and chemotherapy), and radiation (*World Cancer Report, 2003).*

the United States, there were 216,000 cases of invasive breast cancer and 40,000 deaths in 2004.(*Mark ,2006).*Worldwide, breast cancer is the second most common type of cancer after lung cancer (10.4% of all cancer incidence, both sexes counted)[.] and the fifth most common cause of cancer death. In 2004, breast cancer caused 519,000 deaths worldwide (7% of cancer deaths; almost 1% of all deaths) (*WHO, 2004*).

The mainstay of breast cancer treatment is surgery. Adjuvant hormonal therapy (with tamoxifen or an aromatase inhibitor) is given when the tumor expresses estrogen receptors or progesterone receptors. Chemotherapy is given for more advanced stages of disease. Monoclonal antibodies are sometimes used,. Radiotherapy is given after surgery to the region of the tumor bed, to destroy microscopic tumors that may have escaped surgery. Treatments are constantly being evaluated in randomized, controlled trials, to evaluate

and compare individual drugs, combinations of drugs, and surgical and radiation techniques

RFA is a minimally invasive thermal ablation technique in which frictional heat is generated by intracellular ions moving in response to alternating current in which we use 95 C heat temperature for 15 minutes. Currently, RFA appears to be the most promising ablative method for breast cancer lesions (*Muss et al., 2009*).

RFA is a promising minimally invasive treatment of breast carcinomas, as it can achieve effective cell killing without need of surgery, general anesthesia or long hospitalization with a low complication rate (*Herberto et al., 2008).*

AIM OF THE WORK

The purpose of this work is to illustrate the role of Radiofrequency tumor ablation (RTA) in the management of breast cancer lesions.

ANATOMY OF THE BREAST

From infancy to just before puberty, there is no difference between the female and male breasts. With the beginning of female puberty, however, the release of estrogen, at first alone, and then in combination with progesterone when the ovaries functionally mature, cause the breasts to undergo dramatic changes which culminate in the fully mature form. This process on average takes 3 to 4 years and is usually complete by age 16. Further maturation of the breast tissues occurs with lactation and is felt to be mildly protective against breast cancer *(Ramsay et al., 2005).*

POSITION:

The breasts sit over the pectoralis major muscle and usually extend from the level of the 2nd rib to the level of the 6th rib anteriorly. The superior lateral quadrant of the breast extends diagonally upwards towards the axillae and is known as tail of spences.

A thin layer of mammary tissue extends from the clavicle above to the seventh or eighth ribs below and from the midline to the edge of the latissimus dorsi posteriorly.

For clinical purposes, the breast is divided into four quadrants: upper inner, upper outer, lower inner and lower outer quadrants. Cancer occurs most often in the upper outer quadrant (*John & Sons*, *2001*).