ULTRASOUND GUIDED RADIOFREQUENCY ABLATION OF UTERINE MYOMA

Essay

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BY

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Abstract

Uterine fibroid are the most common pelvic tumor in woman of reproductive age, represented about 20-25 %.

So the woman health care center has been interseted to found the good treatment for symptomatic uterine fibroid which has effecting on fertility status of woman.

Radiofrequency ablation performed to treat fibroid uterus in 2004. Radiofreqency ablation is consider as effective day care alternative to conventional surgery.

Key Word: uterine fibroid. Radiofrequency ablation in fibroid uterus

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LIST OF ABBREVIATIONS

Ant **:** Anterior

C.T : Computed Tomography.

D : Douglas pouch

2D : Two dimension

3D : Three dimension

DSA : Digital subtraction angiography

E2 : Estrogen 2

ER : Estrogen Receptor

FDA : Food and Drug Administration

Fig : Figure.

FUS **:** Focused Ultrasound Surgery

G : Gauge

GnRHa : Gonadotropin releasing hormone agonist.

HIFU : High Intensity Focused Ultrasound.

Hpf : highest power frequency

IV : Intravenous

KHz : Kilo Hertz

LM : Laparoscopic Myomectomy

mA : milliampers

MPR : Multiplanar Reconstruction

MRgFUS : Magnetic Resonant Guided Focused Ultrasound Surgery.

MRI : Magnetic Resonance imaging.

NaCl : Sodium chloride

NO : Number

NPV : Non perfused volume.

Post : Posterior

PR : Progesterone Receptor

Pt. : Patient

PVA : Polyvinyl Alcohol.

QOF : Quality of life

RF : Radiofrequency Ablation.

RFA **:** Radiofrequency ablation

RITA : Radiofrequency interstitial thermal ablation

Temp : Temperature

UAE : Uterine Artery Embolization.

UFS : Uterine fibroid symptom.

US : US

V.R : Volume reduction

VU : Vesicouterine fold

W : Watt

Y : Year

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INTRODUCTION

Uterine fibroids are the most common pelvic tumours in women of reproductive age ***(Chavez et al, 2001)***.Over the past decade an increasing demand for uterine-sparing treatment to manage symptomatic uterine myoma has become apparent in woman's health care ***(Ghezz et al., 2007)***.

The reason for requesting conservative procedures include the desire to maintain childbearing potential, the wish to avoid major surgery, and, for some, the belief that the uterus plays a role in perceived sexual satisfaction or is the essence of their womanhood ***(Nevadunsky et al 2007).***

A variety of minimally invasive approaches aimed at preserving the uterus in the face of symptomatic fibroids have been introduced in the clinical arena ***(Ghezz et al 2007)***. Myolysis- an alternative to the conservative surgical treatment of uterine fibroid- was introduced in the late 1980s in Europe **(*Donnez J, et al 2000)***.

A variety of energy sources have been used in myolysis, including the neodymium: yttrium aluminum garnet (Nd: YAG) laser, bipolar electrode, diathermy, cryoprobe, etc. These conventional myolysis methods are performed under general anesthesia by laparoscopy ***(Nisolle et al 2001).***

Radiofrequency myolysis has been performed since 2004.**Hyan Hee CHO** in 2008 suggested that radiofrequency ablation may represent a safe, well-tolerated, and effective day-care alternative to conventional surgery for the treatment of uterine myomas (***CHO et al 2008).***

Luo and his colleagues explored the mechanism by which radiofrequency ablation treats uterine leiomyoma by observing the features of lesion caused by RFA to leiomyoma tissue. They concluded that radiofrequency ablation might treat uterine leiomyomas by inducing coagulative necrosis and depressing Estrogen and Progesterone receptors expression ***(Luo, et al 2007).***

Percutaneous image-guided RFA as adjunctive to uterine artery embolization (UAE) under moderate sedation is feasible .It appears safe without significant morbidity in the treatment of large uterine leiomyomata. Radiofrequency ablation of symptomatic fibroids seems a valuable alternative to major surgery, with durable symptom relief for most patients and a low chance of recurrence one to three years after treatment. A larger data set of long- term efficacy will be awaited with interest ***(Ghezz et al 2007).***

AIM OF WORK

To assess the feasibility and efficacy of Ultrasound guided radiofrequency ablation for symptomatic uterine myoma and to evaluate its outcomes in terms of durability of symptom control and level of health-related quality of life

BASIC ANATOMY OF THE UTERUS

The uterus is a hollow, thick-walled, muscular organ situated deeply in the pelvic cavity between the bladder and rectum. The uterine tubes open into its upper part, one on either side, while below, its cavity communicates with that of the vagina *(fig.1)* ***(Williams et al., 1995).***

The uterus measures about 7.5 cm in length, 5 cm in breadth at its upper part, and nearly 2.5 cm in thickness, it weighs from 30 to 40 gm ***(David and Nayna, 2001)***.

On the surface, about midway between the apex and base, is a slight constriction; known as the isthmus, and corresponding to this in the interior is the internal orifice of the uterus. The portion above the isthmus is termed the body and that below, the cervix. The part of the body that lies above a plane passing through the points of entrance of the uterine tubes is known as the fundus (fig.3) ***(Williams et al, 1995).***

The vesical or anterior surface is covered by peritoneum, which is reflected on to the bladder to form the vesicouterine excavation. The intestinal or posterior surface is covered by peritoneum, which is continued down on to the cervix and vagina. It is in relation with the sigmoid colon, from which some coils of small intestine usually separate it (Douglas pouch) (Fig.2a-b) ***(William et al, 1995).***

The fundus is convex in all directions, and covered by peritoneum continuous with that on the vesical and intestinal surfaces. The lateral margins are slightly convex. The uterine tube pierces the uterine wall at the upper end of each wall. The round ligament of the uterus is fixed

below and in front of this point, while behind it is the attachment of the ligament of the ovary. These three structures lie within a fold of peritoneum, which is reflected from the margin of the uterus to the wall of the pelvis, and is named the broad ligament (Fig.2a) ***(Clare, 1995).***

The cervix is the lowest constricted segment of the uterus. It is somewhat conical in shape, with its truncated apex directed downward and backward, but is slightly wider in the middle than either above or below. Owing to its relationships, it is less freely movable than the body, so that the latter may bend on it. The long axis of the cervix is therefore seldom in the same straight line as the long axis of the body. The long axis of the uterus as a whole presents the form of a curved line with its concavity forward, or in extreme cases may present an angular bend at the region of the isthmus *(Fig.1)* ***(Williams et al, 1995).***

The cervix projects through the anterior wall of the vagina, which divides it into an upper, supravaginal portion, and a lower, vaginal portion *(Fig.1)* ***(Clare, 1995).***

The supravaginal portion is separated in front from the bladder by fibrous tissue (parametrium), which extends also on to its sides and lateral ward between the layers of the broad ligaments. The uterine arteries reach the margins of the cervix in this fibrous tissue, while on either side the ureter runs downward and forward in it at a distance of about 2 cm from the cervix. Posteriorly, the supravaginal cervix is covered by peritoneum, which is prolonged below on to the posterior vaginal wall, when it is reflected on to the rectum, forming the recto uterine excavation ***(Williams et al, 1995).***

The vaginal portion of the cervix projects free into the anterior wall of the vagina between the anterior and posterior fornices. The cavity of the cervix communicates with that of the vagina through a small, depressed, somewhat circular aperture, the external orifice of the uterus (Fig.1) ***(Williams et al, 1995).***

The Cavity of the Body (Fig.3) is a mere slit, flattened antero-posteriorly. It is triangular in shape, the base being formed by the internal surface of the fundus between the orifices of the uterine tubes, the apex by the internal orifice of the uterus ***(Williams et al, 1995).***

Ligamentous support of the uterus:

The ligaments of the uterus are eight in number: one anterior; one posterior; two lateral or broad; two uterosacral; and two round ligaments.

1. The anterior ligament consists of the vesicouterine fold of peritoneum, which is reflected on to the bladder from the front of the uterus, at the junction of the cervix and body (Fig.2) ***(Moore, 1998)***.
2. The posterior ligament consists of the rectovaginal fold of peritoneum, which is reflected from the back of the posterior fornix of the vagina on to the front of the rectum. These folds are named the sacrogenital or recto uterine folds. They contain a considerable amount of fibrous tissue and non-striped muscular fibers which are attached to the front of the sacrum and constitute the uterosacral ligaments (Fig.2) ***(Moore, 1998)***.
3. The two lateral or broad ligaments pass from the sides of the uterus to the lateral walls of the pelvis. Together with the uterus they form a septum across the female pelvis, dividing that cavity into: anterior part

containing the bladder, posterior part containing the rectum, and in certain conditions some coils of the small intestine and a part of the sigmoid colon. Between the two layers of each broad ligament are contained: (1) the uterine tube superiorly; (2) the round ligament of the uterus; (3) the ovary and its ligament; (4) the epoöphoron and paroöphoron; (5) connective tissue; (6) unstriped muscular fibers; and (7) blood vessels and nerves (Fig.6-7) ***(Moore, 1998)***.

4. The round ligaments are two flattened bands between 10 and 12 cm in length, situated between the layers of the broad ligament in front of and below the uterine tubes. The round ligaments consist principally of muscular tissue, some fibrous and areolar tissue, besides blood vessels, lymphatics; and nerves, enclosed in a duplicature of peritoneum (Fig2a) ***(Moore, 1998)***.

In addition to the ligaments just described, there is a band named the ligamentum transversalis colli *(Mackenrodt)* on either side of the cervix uteri. It is attached to the sides of the cervix and to the vault and lateral fornix of the vagina, and is continuous externally with the fibrous tissue, which surrounds the pelvic blood vessels (Fig2b) ***(Moore, 1998).***