2D and 3D ultrasound evaluation of junctional zone in prediction of adenomyosis and its correlation to histopathological findings.

Thesis
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Abstract

Objective:

The aim of this prospective cohort study is to correlate the JZ detectable on 2D- and 3D-TVS with histopathological finding of the adenomyosis and to evaluate their diagnostic accuracy for adenomyosis. .

Material and methods:

one hundred(100) premenapausal women aged above forty with dysfunctional uterine bleeding and candidate for hysterectomy after failed medical treatment in the form of hemostatics and hormonal treatment in the form of cyclic progesterone for three to six cycles.

premenpausal women aged above forty are included in this study but patient with Ovarian pathology(cyst ,tumour), Fibroid uterus, endometrial polyp , or menpausal women are excluded from this study.

They were subjected to verbal consent, full history taking, clinical examination, ultrasound assessment.

Results :

our study found that junctional zone detected by 3D ultrasound and its measurments (max, min,diff) can help in diagnosis of adenomyosis.

Conclusion :

The junction zone diff and its alteration is important ultrasound finding for prediction of adenomyosis.

Key word

adenomyosis.- junctional zone –ultrasound.

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Abbreviations

Us:ultra sound

Jz :junction zone

Max: maximum

Min:minimum

MRI:magenetic resonance image.

TVUS: trans vaginal ultrasound

CT :computerized tomography

GNRHa:Gonadotropin-releasing hormone agonists

IUD: intrauterine device

EMJ :Endometrial myometrial Junction

HLA:human leukocytic antigen

Ptn:patient

2D:two dimension

PPV:positive predictive value

Lng-IUD: Levonorgestrel intrauterine system

Asym:asymmetrical

PPV:positive predictive value

NPV :negative predictive value

Diff:differance

Introduction

   Adenomyosis is a common gynecological disease, characterized by the migration of endometrial glands and stroma from the basal layer of the endometrium into the myometrium, and is associated with smooth muscle hyperplasia.
Its etiology is not known, but recently there have been some interesting theories attempting to explain the association of adenomyosis and the endomyometrial junctional zone.
(C. Exacoustos et al.,2011)

   The JZ(junctional zone) is a distinct, hormone-dependent uterine compartment at the endomyometrial interface that was visualized more than 20 years ago by magnetic resonance imaging (MRI) .
(*Benagiano G et al.,2006).*

   This zone has been cited in the literature by many names, including archimyometrium, inner myometrium and endomyometrial junction, and correlates sonographically to the subendometrial halo or the hypoechoic tissue seen beyond the endometrial basal layer. *(Fusi L et al.,2006)*

   Despite the apparent lack of histological distinction between the JZ and the outer myometrium on light microscopy, these two zones are in reality structurally and biologically different. In recent years, this endomyometrial JZ has emerged as a specialized zone, which governs many critical reproductive functions .(*Kissler S .et al., 2008*).

The JZ thickness increases with age between 20 and 50 years. Kunz et al reported a gradual increase in diameter of the posterior JZ myometrium starting in the third decade of life, which is accelerated markedly in women >34 years old and found that the posterior JZ thickness was invariably higher in patients with adenomyosis . (***Kunz et al.,*** 2000)

Aim of work

The aim of this prospective study is to correlate the JZ detectable on 2D and 3D-TVS with histopathological finding of the adenomyosis and to evaluate their diagnostic accuracy for adenomyosis.

Adenomyosis

Defintion:

The benign invasion of endometrium into the myometrium, producing a diffusely enlarged uterus which microscopically exhibits non-neoplastic endometrial glands and stroma surrounded by the hypertrophic and hyperplastic myometrium.
(*Vercellini et al, . 2006*.)

Prevalence:

The reported prevalence shows a great variation depending on which diagnostic criteria are used and which population is being studied.

Earlier the diagnosis was only made from histological samples, and because most women that have a hysterectomy are in their forties and fifties, the material available for research was not representable for the general population .

Numbers ranging from 1% up to 70% are described, but according to two different systematic reviews done in 2006, the prevalence is thought to be 20%-30% in the general female population . The prevalence amongst women with bleeding disorders is estimated to be closer to 50%.

 (**Bird C et al., 2002.**)

Risk factors

Some evidence point to a familial predisposition. Studies suggest that nearly all cases of adenomyosis occur in multiparous women, and therefore high parity have been thought to be a risk factor.

Now it is considered a consequence of the material originating from women who are relatively older, and have already completed having children.

It is a more common understanding now, that the condition is more closely related to an increased difficulty for the women to become pregnant.

One could imagine that any procedure or condition that disturbs the endometrial-myometrial junction can be a contributing factor to the adenomyosis, although some studies have found no significant correlation between caesarean section, endometrial curettage or evacuation. (**Bergholt et al,. 2001**)

Pathophysiology

The hallmark finding in uterine adenomyosis is the chronic disruption of the boundary between the basal layer of the endometrium and the myometrium, known as the Junctional zone (JZ), and the presence of endometrial glands and stroma within the myometrium.

However, the underlying cause still remains unclear.

The JZ has several distinctive properties, and the disruption of this zone is thought to contribute to the chronic pelvic pain associated with adenomyosis,

as well as infertility, abnormal menstrual bleeding and the development of endometriosis .

Other significant elements in the pathogenesis of the condition are hormonal, immunological, genetic and growth factors .

The ectopic endometrial mucosa resembles non-secretory basal endometrium, and normally the posterior wall of the uterus is affected to a greater extent than other areas of the uterus .

A classification system has been suggested, which makes it possible to grade the adenomyosis:

according to the presence of adenomyotic lesions (>2.5mm from the JZ), depth of penetration of the myometrium ,degree of spread and configuration of the lesion .

   (A)   Depth of penetration:
1. *Mild disease* – involving the inner third of the myometrium
2. *Moderate disease* – involving two thirds of the myometrium
3. *Severe adenomyosis* – involving more than two thirds of the myometrium.

   (B)   Degree of spread:
Grade I: 1-3 islets.
Grade II: 4-10 islets.
Grade III: >10 islets.