Role of Contrast Enhanced MRI and Diffusion Weighted (DWI) MR image in Evaluation of Ovarian Masses

Thesis

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بسم الله الرحمن الرحيم

"ذلك فضل الله

يؤتيه من يشاء والله

ذو الفضل العظيم"

صدق الله العظيم

(سورة الجمعه)

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MRI	**Magnetic resonance image**
DWI	Diffusion weighted image
WHO	World health organization
TNM	(tumor,node,metastasis)
FIGO	International federation of obstetrics and gynecology

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ABSTRACT

Introduction: Ovarian masses present a special diagnostic challenge when imaging findings cannot be categorized into benign or malignant pathology. Ultrasound (US), computed tomography CT, and magnetic resonance imaging are currently used to evaluate ovarian tumors. US is the first- line imaging investigation for suspected adnexal masses helping in detection and characterization of ovarian tumors.

Aim of the work: The aim of the current study is to evaluate the diagnostic value of dynamic contrast enhanced MRI and diffusion-weighted MR imaging in evaluation of ovarian masses.

Patients and Methods: Equipment used: For the MRI examination, PhilpsAchieva 1.5 Tesla closed MRI machine, pelvic phased-array Torso coil.**Study Population:**The study included women presenting with adnexal masses, who are planned to undergo laparotomy.

Keywords:MRI, DWI, Contrast Enhanced, Radiodiagnosis

INTRODUCTION

Ovarian masses present a special diagnostic challenge when imaging findings cannot be categorized into benign or malignant pathology. Ultrasound (US), computed tomography CT, and magnetic resonance imaging are currently used to evaluate ovarian tumors ***(Pierce et al., 2008).***

US is the first- line imaging investigation for suspected adnexal masses helping in detection and characterization of ovarian tumors***(Pierce et al., 2008)***.

An adnexal mass is defined as indeterminate on US when it cannot be confidently placed into either the benign or malignant category ***(Spencer, 2010)***.

CT is commonly performed in evaluation of a suspected ovarian malignancy, but it exposes patients to radiation ***(Valentini et al., 2012).***

MRI can be a valuable problem solving tool, an adjunctive modality for evaluating adnexal lesions, useful to give also surgical planning information without radiation exposure ***(Valentini et al., 2012)***.

It is able to identify different types of tissue contained in pelvis masses, distinguishing benign from malignant ovarian tumors, with an overall accuracy of 88% to 93% ***(Valentini et al., 2012).*** However, the only definitive diagnosis of an ovarian mass is through histology ***(Yeoh et al., 2015).***

Functional imaging techniques are increasingly being used for tumor detection, monitoring of treatment response, and detection of relapsed disease ***(Prakash et al., 2010)***.

Recent technical advances allow the use of dynamic and diffusion MR imaging in abdominal and pelvic applications***(Whittaker et al., 2009).***

Functional imaging by means of dynamic multiphase contrast-enhanced magnetic resonance imaging (DCE-MRI) and diffusion weighted magnetic resonance imaging (DW-MRI) is now part of the standard imaging protocols for evaluation of the female pelvis. DCE-MRI and DW-MRI are important MR imaging techniques which enable the radiologist to move from morphological to functional assessment of diseases of the female pelvis ***(Sala et al., 2010).***

Dynamic contrast enhanced MRI (DCE-MRI) can interrogated the microvascular properties of tissue). DCE-MRI has the ability to noninvasively characterize tissue vasculature ***(Naggara et al., 2008).*** It can depict the distribution of contrast by measuring variations in vessel and tissue enhancement over time. Variations in contrast enhancement are associated with specific histopathological features of the tumor ***(Moreno et al., 2012).***Furthermore it provides additional insight into tumor perfusion and capillary permeability.

Dynamic contrast-enhanced images are useful for the evaluation of complex adnexal lesions, as they may help