Role of magnetic resonance imaging (MRI) in diagnosis of placental lesions

Essay

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List of abbreviations

2D	Two dimensional
ADC	Apparent diffusion coefficient
CLSM	confocal laser scanning microscope
CMV	Cytomegalovirus
DNA	Deoxyribonucleic acid
DVI	Distal villous immaturity
DWI	Diffusion-weighted imaging
EPI	Echo planar image
FGR	fetal growth restriction
FISP	Fast imaging steady-state precession
FLASH	Fast low angle shot
FSE	fast spin echo
FTV	Fetal thrombotic vasculopathy
GD	Gadolinium
GTD	Gestational trophoblastic disease
GW	Gestational week
H&E	Hematoxylin and eosin
HASTE	half-Fourier single-shot turbo spin-echo
HSV	Herpes Simplex Virus
IL	Interleukin
IUFD	Intrauterine fetal death
IUGR	Intrauterine growth restriction
IUO	Internal uterine os
IVF	In vitro fertilisation
MRI	magnetic resonance imaging

NRBC	nucleated red blood cells
P	Placenta
PA	Placenta accrete
PE	Preeclampsia
PECAM	Platelet Endothelial Cell Adhesion Molecule
PGF, PLGF	Placental growth factor
Rh	Rhesus factor
RPOC	Retained Products of Conception
SCH	subchorionic hematoma
SE	spin echo
SSFP	Stedy state free precession
SSFSE	Single shot fast spin echo
STIR	Short T1 inversion recovery
T	Tesla
T1	Spin lattice relaxation time
T1W	T1 weighted
T2	Spin spin relaxation time
T2W	T2-weighted
US	Ultrasound
USG	Ultrasonography
VEGF	vascular endothelial growth factor
VZV	Varicella-zoster virus
β-HCG	β–human chorionic gonadotropin

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Introduction and the aim of work

INTRODUCTION

The placenta is often overlooked in the routine evaluation of a normal gestation, receiving attention only when an abnormality is detected ***(Elsayes et al., 2009).***

Although uncommon, abnormalities of the placenta are important to recognize owing to the potential for maternal and fetal morbidity and mortality ***(Elsayes et al., 2009).***

Pathological conditions of the placenta include placental causes of hemorrhage, gestational trophoblastic disease (GTD), retained products of conception, non trophoblastic placental tumors, metastases and cystic lesions ***(Elsayes et al., 2009).***

The vast majority of placenta accreta are found in women presenting with a previous history of caesarean section and a placenta praevia. Recent epidemiological studies have also found that the strongest risk factor for placenta praevia is a prior caesarean section ***(Jauniaux &Jurkovic, 2012).***

The consequence of placenta accreta is massive hemorrhage at the time of placental separation and complications of blood loss. Hysterectomy is usually required, leading to complications like adjacent organ injuries and serious co-morbidities ***(Varghese et al., 2013).***

Imaging in the antepartum period should be performed with minimal risk to both the mother and developing fetus. As a result, noninvasive techniques such as U/S and MRI that do not use ionizing radiation are preferred ***(Abramowicz and Sheiner, 2007).***

There has been an increase in the use of fetal magnetic resonance imaging (MRI) in the last 20 years. Although ultrasound is and possibly will remain the main tool for

obstetrical imaging, MRI is creating a niche in the areas where ultrasound does not provide complete details or as a second opinion tool to confirm equivocal ultrasonographic findings ***(Gudmundsson et al., 2009).***

Magnetic resonance imaging (MRI) may be useful in detecting placental tissue invasion and evaluating the degree of invasion, especially in a posterior or lateral placenta previa or when there is invasion into the bladder ***(Comstock et al., 2004).***

Magnetic resonance imaging can be of added diagnostic value when further characterization is required, particularly in the setting of invasive placental processes such as placenta accreta and gestational trophoblastic disease ***(Elsayes et al., 2009).***

Dynamic contrast material–enhanced MR imaging allows clear differentiation between the intensely enhancing placenta and weakly enhancing myometrium and may be of benefit in the diagnosis of placental abnormalities ***(Tanaka et al., 2001).***

Aim of the work

The aim of this work is to highlight the role of magnetic resonance imaging in diagnosis of different placental lesions .