



ORIGINAL ARTICLE

Performance of the ESHRE/ESGE classification in differentiating anomalies of double uterine cavity in comparison with the ASRM classification



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KEYWORDS

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Abstract *Objective:* To compare the performance of the ESHRE/ESGE classification with that of the ASRM classification in differential diagnosis and management of cases with double uterine cavity. *Design:* Prospective observational study. *Setting:* Zagazig University hospitals. *Materials and methods:* During the period from January 2014 to January 2015, women referred for 3D-TVS due to the diagnosis of double uterine cavity (by 2D-TVS or hysteroscopy) were included in the study. 3D-TVS examination was performed for all women between days 14 and 21 of the cycle. The ASRM and ESHRE/ESGE classifications were both applied to differentiate anomalies in the studied cases. *Main outcome measures:* In the 100 women included in the study, the ASRM classification classified all cases as having congenital uterine anomalies, with septate uterus being the most frequent (49%). The ESHRE/ESGE classification classified 80/100 as having congenital uterine anomalies, with class U2 (septate) being the most frequent (92.5%). Both classifications showed 'poor' agreement in the diagnosis of congenital uterine anomalies and 'moderate' agreement in the diagnosis of septate uterus (95% CI, 0.315–0.615) and the diagnosis of cases in whom surgical interference (hysteroscopic metroplasty) is indicated (95% CI, 0.433–0.75). However, the frequencies of diagnosis in the last two groups were significantly higher with the ESHRE/ESGE classification. *Major conclusions:* The new classification of ESHRE/ESGE leads to increased frequency of diagnosis of a septate uterus and, subsequently, more cases will be candidate for hysteroscopic metroplasty.

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1. Introduction

Congenital uterine anomalies represent a distortion of the uterine anatomy due to maldevelopment of the Mullerian duct system. The real prevalence of these anomalies remains unclear (1), but it was estimated to be 3–7.3% in general population (2,3), 7.3–13.3% in infertile population (3,4) and 3–38% in population with recurrent miscarriage (3,5). Arcuate uterus,

uterine septum, unicornuate uterus, bicornuate uterus, and uterus didelphys represent the most common Mullerian anomalies (3,4,6).

Despite the conflicting data regarding their mechanism and real role in infertility (3,7,8), the causal relationship between Mullerian anomalies and recurrent miscarriage was confirmed especially with septate and arcuate uterus (3,7,9). If pregnancy progressed there will be an increased risk of prematurity, premature rupture of membranes, breech presentation, cesarean delivery, and IUGR (6).

Combined (hysteroscopy/laparoscopy) was considered the gold standard in differentiating congenital uterine anomalies (7,8), but with advances in imaging techniques, MRI was defended to be the new standard with similar accuracy in evaluation of uterine cavity and fundus. Despite being expensive, it is still less costly and non-invasive method (10–12). Later, three dimensional ultrasonography played a growing role with equivalent diagnostic accuracy to MRI added to significant low cost and better patient tolerance (10,13,14).

Hysteroscopic metroplasty has become the procedure of choice for repair of partial or complete uterine septa and in some instances the arcuate uterus. This approach abolishes the need for abdominal and uterine wall incision; allowing rapid recovery, less morbidity, less abdominal infection and adhesions which may affect future fertility and preserving the chance for vaginal delivery (15). Several studies stated a marked improvement after metroplasty regarding increased both pregnancy and live birth rates in IVF/ICSI and less risk of spontaneous miscarriage (16–20).

Many classification systems were proposed for categorization of Mullerian duct anomalies with variable degrees of acceptance (21–24). For decades the American Fertility Society (AFS) currently American Society of Reproductive Medicine system (ASRM) classification (22) was the most accepted worldwide, being easy to interpret (10,12,14). Unfortunately, it had some deficiencies including difficult categorization of uteri with mixed anomalies (10,25), absence of diagnostic parameters for anomalies and complete dependence on subjective impressions of clinician performing the diagnostic test (9), and being noncomprehensive to some rare anomalies (9,26–28). Some studies added objective parameters to this classification to improve its performance (24,29).

In 2013, the European Society of Human Reproduction and Embryology (ESHRE) and the European Society for Gynaecological Endoscopy (ESGE) innovated a new classification based primarily on anatomy of the female genital tract. Anomalies are classified progressively according to the degree of the anatomical deviation. Co-existent cervical or vaginal anomalies are classified independently. They supposed that this new classification is reproducible and easy to describe anomalies in precise way, and could help in the development of management guidelines (30).

The aim of this study was to compare the performance of the ESHRE/ESGE classification with that of the ASRM classification in differential diagnosis and management of cases with double uterine cavity.

2. Materials and methods

This prospective observational study was carried out in Zagazig University hospitals during time period from January

2014 to January 2015. It was approved by the institutional review board on the 11th of December 2013 with a reference number 2126. After oral consent, we included non-pregnant women referred for three dimensional transvaginal sonography (3D-TVS) due to the diagnosis of double endometrial stripe on two dimensional transvaginal sonography (2D-TVS) or double uterine cavity on hysteroscopic examination. Women with history of uterine surgery or with uterine lesions that distort the shape of the cavity, were excluded from the study.

3D-TVS examination was performed for all women between days 14 and 21 of the cycle using an endocavitary high frequency convex 3D/4D transducer (BE1123) on a MyLab 60 (Esaote, Italy) ultrasound machine by one sonographer. A volume of the whole uterus was acquired with a sweep angle of 95°. The volume was manipulated in the multiplaner mode to reconstruct the coronal plane of the uterus.

To differentiate bicornuate, septate and arcuate uterine anomalies, we applied the ASRM classification with the aid of Salim et al. methodology (22,24) to all cases. *Bicornuate uterus* was diagnosed when the external contour was depressed by >10 mm, dividing the two cornua completely (*complete bicornuate*) or incompletely (*partial bicornuate*). *Septate uterus* was diagnosed when the external contour was convex or with a depression <10 mm, with presence of a septum that completely divides cavity from fundus to cervix (*complete septum*) or does not extend to the cervix, with central point of septum at an acute angle (<90°) (*partial septum*). *Arcuate uterus* was diagnosed when the internal contour was concave with central point of fundal depression at obtuse angle (>90°) and the external contour was convex or with a depression <10 mm. The uterus was considered *normal* when the internal contour was convex or straight and the external contour was convex or with a depression <10 mm.

The ESHRE/ESGE classification (30) was then applied to the acquired volumes of all cases. They were classified as follows:

- *Normal uterus (Class U0)*: a uterus in which the fundal internal contour is either straight or curved but with a depression in the midline $\leq 50\%$ of the uterine wall thickness.
- *Septate uterus (Class U2)*: a uterus with normal fundal external contour and a depression in the midline >50% of the uterine wall thickness. This class is subdivided into two sub-classes: *class U2a* or *partial septate uterus* (the lower edge of the septum does not reach the level of the internal cervical os), and *class U2b* or *complete septate uterus* (the lower edge of the septum reaches the level of the internal cervical os).
- *Bicorporeal uterus (Class U3)*: a uterus with a fundal external contour depressed in the midline by >50% of the uterine wall thickness. This class is subdivided into three sub-classes: *class U3a* or *partial bicorporeal uterus* (the external contour depression partially divides the uterine corpus above the level of the cervix), *class U3b* or *complete bicorporeal uterus* (the external contour depression completely divides the uterine corpus up to the level of the cervix), and *class U3c* or *bicorporeal septate uterus* (the thickness of the midline depressed part of the fundus >150% of the uterine wall thickness).

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