

Original Article

New Outpatient Subclassification System for American Fertility Society Classes V and VI Uterine Anomalies

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ABSTRACT **Study Objective:** To produce and validate a simple, systematic and reproducible subclassification system for uterine anomalies previously classified by the American Fertility Society as Class V and VI to achieve a precise definition of each uterine anomaly, confirm the feasibility and safety of surgical correction of the anomalies, determine the type of hysteroscopic treatment, and provide a standard by which patient selection, treatment, and reproductive outcomes can be compared between centers.

Design: Descriptive study (Canadian Task Force Classification III).

Setting: Department of obstetrics and gynecology of a private clinic (hospital).

Patients: Eighty-nine patients undergoing office hysteroscopy to assess partial or complete "double" uterine cavity.

Interventions: All patients underwent 3-dimensional ultrasound. Data from hysteroscopy and untrasonography were combined to produce a geometric model comprising uterine septum length (Z variable) and fundus depth (Y variable) through which a new subclassification of the uterine anomalies was elaborated.

Measurement and Main Results: One patient with a bicornuate uterus detected at ultrasonography was excluded from the study. The remaining 88 patients were classified according to our subclassification system. Seventy-three patients categorized as having Z ≥ 2 cm or greater (septum intersecting one-third of the uterine cavity or more) and Y more than 0 cm (normal or straight uterine fundus) underwent resectoscopic metroplasty without laparoscopic control. Twelve patients categorized as A1 (normal uterine fundus and septum ≤ 0.5 cm) underwent office metroplasty. Two patients categorized as B1 (straight fundus and septum ≤ 0.5 cm) and 1 categorized as C1 (concave fundus and septum ≤ 0.5 cm) were not considered candidates for surgery. Second-look hysteroscopy confirmed complete removal of the septum in the 12 patients who underwent office metroplasty (100%) and in 70 of 73 patients (96%) who underwent resectoscopic metroplasty. Comparison of these data with data retrospectively obtained in 596 women who had undergone traditional resectoscopic metroplasty under laparoscopic control did not demonstrate any significant difference in success and complication rates.

Conclusion: Our outpatient subclassification system may address a precise diagnosis and a thorough categorization of patients with a partial or complete double uterine cavity, enabling safe and effective metroplasty without use of laparoscopy. *Journal of Minimally Invasive Gynecology* (2009) 16, 554–61 © 2009 AAGL. All rights reserved.

Keywords: Arcuate uterus; Classification system; 3-Dimensional ultrasound; Hysteroscopy; Metroplasty; Septate uterus

Although uterine malformations are a common clinical occurrence, their true incidence is not well established. These malformations include the miscellaneous group of

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anomalies that result from major disturbances in the formation, fusion, or development of müllerian ducts during fetal life [1]. Uterine malformations are frequently asymptomatic. However they have been linked to an increased incidence of adverse reproductive outcomes including spontaneous abortion, preterm labor, placental abruption, and fetal death [2–6]. Because these adverse events are all thought to be related to an abnormal uterine cavity or anomalous uterine vascularization, surgical correction of the anatomical defect has been proposed as the basis of treatment.

The necessity to establish whether and how to provide surgical correction of the defect has led to development of a large number of classifications of uterine anomalies. A systematic classification differentiating septate from bicornuate uterus was introduced for the first time by Strassman in 1907 [7]. Subsequently, in 1979, Buttram and Gibbons [8] proposed a new classification arranged into 6 subgroups, which was revised in 1988 by the American Fertility Society (AFS) and is currently widely accepted worldwide [9].

A limitation of the AFS classification is that it does not specify diagnostic methods to detect anomalies suspected only on the subjective impression of the clinician performing the test [2]. In addition, malformations with features included in more than one category cannot be classified individually and precisely [10]. In particular, an important issue raised by the AFS classification system concerns the differentiation between class V (septate) and class VI (arcuate) anomalies. This is clinically important because recent reports have suggested that septate and arcuate uteri account for about 55% to 66% of uterine malformations [3]. In addition, it should be noted that although they share the same embryologic origin (failure of resorption of the midline septum between the 2 uterine horns), these subtypes exhibit different histologic features and reproductive complications, and require different clinical management.

Septate uterus is the result of incomplete resorption of the adjacent walls of the 2 müllerian ducts. The resulting fibromuscular structure can range from a slight midline septum in the fundus of the uterus (partial septate or subseptate uterus) to complete midline division of the endometrial cavity (septate uterus). The external uterine contour is typically convex but may be flat or slightly concave (with a fundal cleft <1 cm) [10,11].

The arcuate uterus exhibits a simple change in the uterine cavity shape that demonstrates a mild fundal muscular indentation resulting from near-complete resorption of the uterovaginal septum with no external dimpling [10,11]. The outer contour of the uterus is regularly convex or flat. Because the arcuate uterus has a unified external contour, some authors have initially proposed that it be considered a mild form of septate uterus, with a small partial septum. However, because of the vast differences in the clinical characteristics of arcuate uterus and septate uterus, the AFS classification system classifies arcuate uterus separately (class VI). Women with a septate uterus have the highest incidence of reproductive complications, with a term delivery rate of approximately 40%. However, surgical correction of the anatomical defect substantially improves the reproductive prognosis in these patients [12].

Conversely, the effects of arcuate uterus on reproduction are still cause for debate [13–15]; some authors believe it represents a variant of normal anatomy with minimal (term pregnancy rate ~65%) or no effect on reproduction [16,17]. Therefore, while most authors believe that this anomaly does not require any surgical correction because of the muscular nature of the indentation, others report successful treatment of this anomaly [18,19]. However, owing to lack of objective criteria to achieve a precise

differential diagnosis between subseptate and arcuate uterus, it cannot be determined with any degree of certainty whether return to normal fertility was the result of overtreated arcuate uterus or misdiagnosed subseptate uterus.

A precise classification of müllerian anomalies characterized by complete or partial “double” uterine cavity has traditionally been achieved using the combination of hysteroscopy, which investigates the appearance of the uterine cavity, and laparoscopy, which evaluates the uterine serosal surface [12,19–22]. More recently, use of 3-dimensional ultrasound (3D US) for differential diagnosis has also been suggested [14,21,23–25]. However, at present, none of these procedures, either alone or in various combinations, have substantially addressed the issue of exact definition of each anomaly. Furthermore, reproducible criteria to differentiate and manage such anomalies are lacking, thus hampering a comparison of clinical data between different centers.

The objective of the present study was to produce and validate a simple, systematic, reproducible subclassification system for uterine anomalies previously classified as class V and class VI to achieve a precise definition of each anomaly; predict the feasibility and safety of surgical correction of the anomaly; determine the type of hysteroscopic treatment, if indicated; and provide a standard by which patient selection, treatment, and reproductive outcomes can be compared between centers. The study was approved by the Research Ethics Committee of the Hospital “Madre Fortunata Toniolo,” Bologna, Italy.

Materials and Methods

Patients

Between January 2006 and September 2007, a study group comprising 89 women of reproductive age (mean age, 34 years; age range, 26–42 years) referred to the department of obstetrics and gynecology of the private clinic “Madre Fortunata Toniolo” and diagnosed as having a partial or complete double uterine cavity at hysteroscopic examination were enrolled in the study. The women were referred by their primary care physicians or hospital consultants because of either recurrent abortion (92%) or for infertility workup (8%). Exclusion criteria were ongoing pregnancy, presence of uterine myomas or polyps that distorted the uterine cavity, and previous myomectomy. Women recruited for the trial were counseled and gave informed consent. Data obtained from the study group (group A) were compared with those for 596 women (group B) who had undergone hysteroscopic metroplasty under laparoscopic control in the same department between 1990 and December 2005.

Subclassification System

A database file was set up using commercially available software (Excel for Windows; Microsoft Corp, Redmond, WA) to facilitate data entry and retrieval. Data deriving from both hysteroscopy and 3D ultrasound examination

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