# Congenital Anomalies of the Uterus, and Ultrasound Diagnostics

Nenad Miseljic[1], Sebija Izetbegovic[2], Senad Mehmedbasic[3], Sanja Miseljic[4]
[1]Department of Obstetrics and Gynecology, General Hospital "Prim dr Abdulah Nakas", Sarajevo, Bosnia and Herzegovina
[2]Gynecology and Obstetrics Clinic, Clinical Center of University of Sarajevo, Bosnia and Herzegovina
[3]Department of Gynecology, Infertility and Neonatology "Mehmedbasic", Sarajevo, Bosnia and Herzegovina
[4]Clinic for Heart Disease and Rheumatism, Clinical Center of University of Sarajevo, Bosnia and Herzegovina

**ORIGINAL PAPER**

**SUMMARY**

Sonographic detection and evaluation of congenital anomalies of the uterus represent an important segment in the additional therapeutic procedure, that is, treatment of patients with congenital anomalies of the uterus. Besides the primary reason that is manifested in the total cure of the patients, the secondary reason represents the decrease of costs of treatment of congenital anomalies of the uterus. Both descriptive and analytical methods were used in this paper. In 1997 Kurjak and Kupesic compared the sensitivity and specificity of transvaginal ultra sound, color Doppler, hysterosonography and three-dimensional ultrasound during diagnosis of the uterus septum. Representation of pathological findings in our paper in comparison to the examined group is: uterus subseptus = 15.38%, double horned uterus = 10.25%. The examined group includes intrauterine abnormalities of the uterus, analyzing, in that process, individual, pathological entities of intrauterine abnormalities. The research is a prospective, target, clinical study. In the examined group, due to the clinical suspicion of intrauterine abnormalities, 78 patients were examined in the following manner: two-dimensional transabdominal and transvaginal black-and-white and color Doppler ultrasound examinations were made and then three-dimensional transabdominal black-and-white and color Doppler ultrasound examinations. This means that in the detection of congenital anomalies of the uterus, the same sonographic techniques were first applied on the conventional and then also on the multidimensional base. Our research showed that three-dimensional technique is a more reliable diagnostic tool than two-dimensional technique. Sensitivity and specificity rate as well as positive predictive value show that this technique is an extraordinary one for assessing the volume, and position of congenital abnormalities.

**Keywords: ultrasound, congenital anomalies, uterus**

Corresponding author: Nenad Miseljic, MD, MSci, General Hospital „Prim dr Abdulah Nakas". Tel. 033 285 100. E-mail: nenad.miseljic@gmail.com

## 1. INTRODUCTION

In 1997 Kupesic and Kurjak were evaluated sonographic aspects of congenital anomalies of the uterus (1). The study involved 420 patients in whom the previous diagnostic procedures done hysteroscopy. The final diagnosis was given at hysteroscopy when presented inside the uterus. Uterus septus is diagnosed in 278 patients. Transvaginal sensitivity of ultrasound in diagnosis was 95.21%, a specificity of 92.21%. For transvaginal colored Doppler sensitivity was 99.29%, a specificity of 97.93% (2). In case of hysterosonography sensitivity was 98.18%, a specificity of 100%. Hysterosonography was done in 76 patients, and only in one patient failed to diagnose the barrier, although it existed. Hysterosonography and three-dimensional ultrasound is the best method for noninvasive diagnosis of uterine barrier (3, 4, 5, 6, 7).

## 2. PATIENTS AND METHODOLOGY

This study included 78 patients (patients with established intrauterine abnormality and healthy patients) that are in the research divided into two groups. Group A were patients with congenital and acquired intrauterine abnormality by 2D sonography. Group diagnosed as B patient with intrauterine abnormalities verified by the method of 3D sonography. The control group consists of the same number of patients, which is done at the diagnostic, therapeutic (operational) and hysteroscopy findings obtained pathohistological thereafter. The techniques used in the work are: anamnesis information (personal history, family history, etiology of congenital or acquired intrauterine abnormalities). In addition used is the following information: age, parity and clinical treatment (2D sonography, 3D sonography, gynecological findings, colposcopic findings, PAPA test, HPV typing, laboratory findings). Obtained results are statistically processed.

## 3. RESULTS

Table 1 shows the number and type of intrauterine abnormalities. So the total number of intrauterine abnormalities (N = 78): Miomas were 24 (30.76%), sub septum 12 (15.38%), bicornis 8 (10.25%), polyps 26 (33.33%) and adhesion 8 (10.25%). The greatest incidence of polyps and the smallest is of bicornis and adhesion.

| TYPE | mioma | sub septum | Bicornis | polyp | adhesion | TOTAL |
|---|---|---|---|---|---|---|
| Number | 24 | 12 | 8 | 26 | 8 | 78 |

**TABLE 1.** Number and type of intrauterine abnormalities

Table 2 show search for sub septum with the help of indicator attributes: A

| US method | | A | B | C | D |
|---|---|---|---|---|---|
| | | | | | |
| 2D | TA CB | 5 | 10 | 10 | 7 |
| | TA CD | 5 | 10 | 10 | 7 |
| | TV CB | 7 | 5 | 7 | 5 |
| | TV CD | 8 | 5 | 7 | 4 |
| | | | | | |
| 3D | TA CB | 9 | 4 | 4 | 3 |
| | TA CD | 9 | 4 | 4 | 3 |
| | TV CB | 10 | 1 | 1 | 2 |
| | TV CD | 11 | 0 | 1 | 1 |

**TABLE 2.** Evaluation of results from examination "Sub septum" N=12

| Change | Sub septum | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Method | 2D | | | | 3D | | | |
| | TA CB | TA CD | TV CB | TV CD | TA CB | TA CD | TV CB | TV CD |
| SEN | 0.33 | 0.41 | 0.41 | 0.42 | 0.88 | 0.80 | 0.84 | 0.84 |
| SPEC | 0.41 | 0.41 | 0.41 | 0.50 | 0.88 | 0.88 | 0.88 | 1.00 |
| PPV | 0.33 | 0.33 | 0.33 | 0.41 | 0.88 | 0.88 | 0.88 | 1.00 |
| NPV | 0.41 | 0.41 | 0.41 | 0.48 | 0.88 | 0.88 | 0.88 | 1.00 |

**TABLE 3.** Testing US method in variable: Sub septum

(US review and changes are present), B (US + changes and false negative), C (US-change and false positive) and D (US and negative changes). The investigation of 2D and 3D Sonography with TA and black and white and color Doppler techniques. In table are presented numerical data for each technique.

Table 3 shows testing with US method of the variables sub septum with statistical indicators: the rate sensitivity, specificity rates, positive predictive value and negative predictive value. Showed are the numerical values for each technique.

Testing these variables showed that three-dimensional UZ technology is much better diagnostic tool than two-dimensional scan. Results of black and white and color Doppler techniques do not differ significantly in finding the size and volume of the variable. Transvaginal technique gives better diagnostic value than transabdominal display.

## 4. DISCUSSION

Sonography aspect of the anomalies of the uterus is necessary to know not only to the primary diagnosis, confirming the status already discovered, or to have more complete monitoring of the development of gestation, but also to avoid diagnostic pitfalls, and coincidence with other pathologic entities, which lead to problems that it is necessary to be removed by therapeutic procedures.

Congenital malformations of the uterus may be of structural nature, that may be a genetic and chromosome irregularities, when a rule is more affected by genital organs, and close (renal and urinary tract), or other systems. One known as the associated anomalies or syndromes, often called by some author so in this case is proper to speak of anomalies. Dominated are fusion anomalies in embryogenesis development (8, 9, 10).

In our paper: 2D verified changes in relation to tested group (n = 78) diagnosed modified = 62 (79.5%), undiagnosed changes 16 (20.5%), 3D verified changes in relation to tested group (n = 78); diagnosed modified = 75 (96.1%), undiagnosed modified 3 (3.9%). The difference is significant (p = 0.003), 3D US is significantly better compared with the 2D US.

## 5. CONCLUSION

Two-dimensional technique has serious drawbacks in view of sub septum, bicornis, and localization of polyps. All volumes measured by this technique are not precise (11, 12, 13).

Transvaginal technique becomes a "gold standard" with gynecological diagnosis of intrauterine abnormalities. Its positive and negative predications and the rate of specificity and sensitivity rates for virtually all variables that we explored are very high and favorable (14, 15).

Multidimensional ultrasonic technology, which according to the principle of two-dimensional display with support for the program creates a multidimensional experience of space which provides a complete diagnostic evaluation of intrauterine abnormalities. Three dimensional transvaginal color Doppler ultrasound technique is the "gold standard" in diagnosing all intrauterine abnormalities.

## REFERENCES


1. Kupesic S, Kurjak A, Zodan T. Staging of endometrial carcinoma by 3-D power Doppler. Gynecol Perinatol 1999;8(1): 1-5.
2. Kurjak A, Kupesic S, Zalud I, Predanic M. Transvaginal color Doppler. In Dodson MG, ed. Transvaginal Ultrasound. New York: Churchill Livingstone, 1995:325-39.
3. Goldstein SR, Monteagudo A, Popiolek D, Maybery P, Timor Tritsch I. Evaluation of endometrial polyps. Am J Obstet Gynecol 2002; 186(4):669-674.
4. Perez-Medina T, Bajo J, Huertas MA, Rubio A. Predicting atypia inside endometrial polyps. Journal Ultrasound Med 2002;21(2):125-128.
5. Bonilla-Musoles F, Raga F, Osborne N, Blanes J. Coelho F. Three-dimesional hysterosonography for the study of endometrial tumors:comparison with conventional transvaginal sonography, hysterosalpingography, and hysteroscopy. Gynecol Oncol 1997;65:245-52.
6. Lev-Toaff AS, Rawool NM, Kurtz AB, Forssberg F, Goldberg BB. Three-dimensional sonography and 3D transvaginal US: a problem solving tool in complex gynecological cases. Radiology 1996;201(P): 384.
7. Szabo I, Szantho A, Csabay L, Csapo Z, Szirmai K, Papp Z. Color Doppler ultrasonography in the differentation of utherine leiomyomas. E J Gynaecol Oncol 2002; 23(1): 29-34.
8. Gruboeck K, Jurkovic D, Lawton F, Savvas M, Tailor A, Campbell S. The diagnostic value of endometrial thickness and volume mesurements by three-dimensional ultrasound in patients with postmenopausal bleeding.Ultrasound Obstet Gynecol 1996;8(4):272-6.
9. Jarvela I, Tekay A, Santala M, Jouppila P, Thermal balloon edometrial ablation therapy induces a rise in uterine blood flow impedance: a randomized prospective color Doppler study. Ultrasound Obstet Gynecol 2001;17(1):65-70.
10. Yaman C, Ebner T, Jesacher K, Obermayr G, Polz W, Tews G. Reproducibility of three-dimesional ultrasound endometrial volume measurements in patientswith postmenopausal bleeding. Ultra obstet Gynecol 2002;19(3):282-286.
11. Fedele I, Bianchi S, Dorta M, Arcaini L, Zanotti F, Carinelli S. Transvaginal ultrasonography in the diagnosis of diffuse adenomyosis. Fertil Steril 1992; 58:94.
12. Fleischer AC,Kepple DM,Entmann SS,Transvaginal sonography of uterine Discorders.U:Trimor-Tritsch iE,Rottem S(ur.) Transvaginal sonography, 2 Izdanje,1991 (New York: Elsevier).
13. Fleischer AC,Kepple DM.Benign condition of the uterus ,cervix and endometrium.U:Nyberg DA,Hill LM ,Bohm-Velez M,Mendelson EB (ur.) Transvaginal ultrasound,p. 21.1992 (St. Louis :Mosby Year Book).
14. Bridges NA,Cooke A,Healy MJ,Hindmarsh PC,Brook CG,Growth of the Uterus.Arch Dis Child 1996;75(4):330-1.
15. De Vries K,Lyons EA,Ballard G,Levi CS,Lindsay DJ.Contractions of the inner third of the myometrium.Am J Ostet Gynecol 1990;162:679-82.