Reproductive Outcome Following Hysteroscopic Treatment of Uterine Septum

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ABSTRACT

Background: Septate uterus is the most common uterine anomaly and a cause for miscarriage and infertility. Existing data suggested a better reproductive outcome of uterine septum following hysteroscopic septum resection. Objective: Current study was administered to share our experience in hystroscopic septum resection for reproductive outcome following hysteroscopic treatment of uterine septum and specifically focusing on different treatment protocols after hysteroscopic septum resection. Methods & materials: This study was a cross-sectional study based on secondary data that was obtained from medical records of infertile women who had undergone transvaginal hysteroscopy and used different treatment protocols after hysteroscopic correction of uterine septum in Infertility and Reproductive Health Research Center between April 2005 and February 2014. Results: The total number of infertile women underwent hysteroscopy uterine septoplasty was 106. The hysteroscopy septoplasty resulted in an overall pregnancy rate of 67% and a live birth 57.5%. Pregnancy rate for patients who had not male infertility was 92.1%. The chi-square test did not reveal any statistically significant difference in side effect, pregnancy, live birth, abortion, preterm deliveries, and term deliveries rate between these patients either with consistent hormone therapy plus IUD insertion or with alternate hormone therapy plus IUD after hysteroscopic metroplasty. Conclusion: The findings of the present study indicated hysteroscopic septum resection to remove a uterine septum in women with infertility is safe and may be an efficacious procedure. Treatment following hysteroscopic septum resection, either the consistent or the alternate protocol is both beneficial to improve pregnancy rate. Key words: Septum resection, Pregnancy rate, Treatment protocols, Reproductive outcome, Hysteroscopy, Uterine septum.

1. INTRODUCTION

Uterine septum is the known type of congenital uterine malformation, approximately with 80–90% of uterine malformations. It can be lead to infertility, miscarriage, abnormal fetal position, and premature birth. Hysteroscopic metroplasty is a simple and safe approach for the removal of the uterine septum (1-5). Many studies represented the progression of spontaneous pregnancy rate after the hysteroscopic removal of separte uterus (6-23). In addition, some investigator suggested different treatment protocol after septum resection to impede asherman syndrome. The postoperative hormone therapy using estrogen and terminal progesterone is controversial because their efficacy has not been demonstrated in well-designed, prospective, randomized studies. They utilized hormone replacement therapy (HRT) and/or temporary splints such as the intrauterine device (IUD) to maintain the uterine cavity distended to denuding endometrial cavity to prevent septal fusion (24-28). Nonetheless, They also suggested artificial stimulation of endometrial growth postoperatively may assist in the overall healing process by artificially enhancing endometrial growth by use of estrogen and subsequent shedding by use of terminal progesterone, paving the way to normal endometrial growth and subsequent spontaneous ovulation (5, 29, 30).

In spite of the comprehensive study of infertility, little data are available concerning the benefit of different treatment protocols after septum resection on fertility consequence. Our interest was to assess the efficacy of hysteroscopic septum resection on pregnancy rate and benefit of postoperative various methods in infertile women after septum resection.

2. MATERIALS AND METHODS

This study was approved by the ethics committee of Babol University of Medical Sciences. A compilation sheet was developed for the present study after taking permission from the general director of the Center to inspect the information existing in the medical records of infertile women. The research design of this study was a cross-sectional study. The study was based on secondary data from Fatemezahra Infertility and Reproduc-
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Statistical analysis

Data were analyzed using SPSS version 18.0. Comparisons between the type of protocols after septum resection and characteristics of variables were made using t-test. A P value of <0.05 was considered statistically significant. Qualitative data are presented as number and percentage and comparison between groups are estimated by Chi – square and Fisher’s exact test.

3. RESULTS

Out of 106 infertile women with septate uterus who undergone hysteroscopy septum resection, 71 (67%) of the patients received first protocol after septum resection and 35(33%) second protocol. The mean educational of infertility was 4.5±3.3 years. The BMI and menarche age the subjects were 27±4.3 kg/m² and 12.9±1.0 years, respectively. Table 1 shows some of the characteristics for different treatment protocols after hysteroscopic septum resection. There was no significant difference between age, menarche age, BMI, job of women, infertility type, and duration infertility types with treatment protocols of patients Table 2 presented reproductive outcome and side effect after septum resection with different treatment protocol, showed a pregnancy rate after hysteroscopic septum resection was enhanced. 44(62.0%) of patients had a positive pregnancy rate with first treatment protocol, while 27(77.1%) of patients with Second treatment protocol had a positive pregnancy rate.

Table 1: Characteristics of women with intrauterine septum according to some characteristics (n=106), Independent T Test

| Variables | First protocol (n=71) | Second protocol (n=35) | p-Value* |
|-----------|---------------------|-----------------------|----------|
| Age(years) mean±SD | 30.5±5.1 | 31.5±4.9 | 0.295 |
| Menarche age | | | |
| <13 | 19(26.8) | 1(40.0) | 0.166 |
| ≥13 | 52(73.2) | 21(60.0) | |
| BMI(kg/m²) | | | |
| <25 | 24(33.9) | 10(28.6) | 0.587 |
| ≥25 | 47(66.2) | 25(71.4) | |
| Job | | | |
| Housewife | 62(87.3) | 31(88.6) | 0.562 |
| Work | 9(12.7) | 4(11.4) | |
| Duration infertility | | | |
| <5 | 40(56.3) | 25(71.4) | 0.134 |
| =>5 | 31(43.7) | 10(28.6) | |
| Infertility type | | | |
| Primary | 39(54.9) | 21(60.0) | 0.620 |
| Secondary | 32(45.1) | 14(40.0) | |
| Male Infertility | 21(29.6) | 8(22.9) | 0.465 |

Table 2: Reproductive outcome and side effect after septum resection with different treatment protocol, *Chi. Square Test

| Variables | First protocol (n=71) | Second protocol (n=35) | p-Value* |
|-----------|---------------------|-----------------------|----------|
| Side affect after treatment | 20(28.2) | 9(25.7) | 0.790 |

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The text is a summary of a research study on the treatment of uterine septum, focusing on the reproductive outcomes and side effects of different treatment protocols. The study involved 106 infertile women with septate uterus, of whom 71 received the first protocol and 35 received the second protocol. The study compared age, menarche age, BMI, job of women, infertility type, and duration of infertility between the two groups. The reproductive outcomes and side effects were also compared. The results showed a statistically significant difference in pregnancy rate between the two treatment protocols, with the second protocol having a higher pregnancy rate. The data were analyzed using SPSS version 18.0, with t-tests and Chi-square tests being used for comparisons. The study concluded that the second treatment protocol was more effective in improving pregnancy rates.
Treatment following hysteroscopic septum resection, either the consistency or the alternate protocol is both adequate to improve rates of pregnancy. There is no meaningful advantage between two adjacent postoperative hormone therapies on pregnancy rate. 27 (28.8%) patient had a spontaneous pregnancy with first treatment protocol after hysteroscopic resection of uterine septum while 16 (45.7%) with second treatment protocol had spontaneous pregnancy. After ART, 17 (23.9%) who used first treatment protocol had a pregnancy and 11 (31.4%) with second treatment protocol had pregnancy after ART while 27 (38.0%) patient had not pregnancy after using first treatment protocol and 8 (22.9%) patient had not pregnancy after using second treatment protocol. Live Birth rate in patients with first and second treatment protocol was 37 (52.1%) and 24 (68.6%), respectively. Abortion rate in patients with first and second treatment protocol was 3 (4.2%) and 2 (5.7%), respectively. Preterm deliveries in patients with first and second treatment protocol was 7 (9.9%) and 7 (20.0%), respectively. Term deliveries in patients with first and second treatment protocol was 34 (47.9%) and 18 (51.4%), respectively. Side effect of first and second treatment protocol was 20 (28.2%) and 9 (25.7%), respectively. Chi-square test revealed no statistically significant difference in upper variables and two treatment protocols. 84 (79.2%) had no side effects during and after both treatments but 1 (9%) stopped treatment and 21 (19.8%) needed to add drug. Patients during treatment with first protocol 20 (28.2%) had a side effect but with second protocol 9 (25.7%) had side effect.

4. DISCUSSION

Most of the researchers have shown a better reproductive outcome after hysteroscopic resection of uterine septum in women with septate uterus, however, there is no evidence on the postoperative management of the hysteroscopic septum division (27)(48). Most of authors also reported hysteroscopic metroplasty in patients with uterine septum improved pregnancy rate (10, 42). In this study, pregnancy rate and live birth rate after hysteroscopic septum resection in women with septate uterus was high. Two studies found that the pregnancy rate after hysteroscopic metroplasty (around 40%) was lower compared with results (67.0%) (3, 15, 43, 49). Other observational studies also have reported similar findings (50).

In a retrospective, matched, controlled study, the role of septate uterus in the reproductive performance of patients requiring in vitro fertilization (IVF) was evaluated. The pregnancy rate before metroplasty was lower than after metroplasty, and the abortion rate was higher. They suggest that the presence of septate uterus may be decreased the pregnancy rate and increased the abortion rate after the embryo transfers for IVF/ICSI (51). In the present study, in 63 patients who had hysteroscopic resection of uterine septum and did not conceive naturally pregnant, of these 28 (44.5%) became pregnant by ART.

Many authors studied on pregnancy outcome after hysteroscopic septum resection but they did not use hormonal postoperative therapy and concluded improved pregnancy rate after hysteroscopic septum resection (9, 11, 15, 18, 20, 21, 38, 52-60). Nouri et al also agreed with these results and they represented an overall pregnancy rate of 60.1% and a live-birth rate of 45% after hysteroscopic metroplasty (20). Other studies also have shown that neither IUD placement, nor estrogen treatment, nor both prevent intrauterine adhesions or facilitate pregnancy after hysteroscopic uterine septum resection (29). Another study also was agreed that a postoperative 3-month estrogen plus IUD insertion or estrogen alone after hysteroscopic metroplasty are not necessary (61). This result showed that after hysteroscopic metroplasty without using postoperative therapy also we had improved reproductive outcome. Versus other authors also studied on pregnancy outcome after hysteroscopic septum resection but they used hormonal postoperative therapy and concluded improved pregnancy rate after hysteroscopic septum resection (13, 62-70).

While some authors were used only estrogen after hysteroscopic metroplasty but reproductive performance significantly improved (26, 45, 71-73). We found that both intrauterine device and estrogen plus progesterone (HRT) was same for effect on reproductive outcome and the was no significant difference between two protocols on pregnancy rate (41).

In our infertility center we used two treatment protocols that mentioned upper and this was according to our surgeon’s idea. We were able to show that the different treatment after septum resection was elected according to surgeon’s idea and the postoperative reproductive outcome was similar in both method and there were no significant differences on delivery rates. The presenting findings showed that hysteroscopy for resection of uterine septa will increase the odds of clinical pregnancy in infertile women, but the evidence is not conclusive at present. Therefore, it is suggested that in women with septate uterus and a history of infertility, hysteroscopic septoplasty is a confident and efficient procedure resulting in a higher pregnancy rate. But more randomized controlled trials and prospective studies with enough samples with no intervention and consistent follow-up data are needed to, which could provide the highest level of evidence and substantiate the effectiveness of the hysteroscopic removal of uterine septum in infertile women and various postoperative treatments. Further research studies should focus on specific populations with clear indications, to draw reasonable and meaningful conclusions about the outcomes of hysteroscopic metroplasty. Adequate time after the procedure should be allowed so that subjects have ample time to attempt conception and also to give birth, to allow for accurate live-birth rate calculations.

**Limitation:** Because of some limitations, we don’t have access to all surgical reports and therefore lacked detailed data on the diameter of cervical dilatation and intraoperative findings in some cases; we were also not able to calculate the exact time interval between the hysteroscopic intervention and the beginning of the pregnancies. A short interval between hysteroscopic intervention and conception might be an additional risk factor for preterm birth. Second, some of the infertile patients who underwent hysteroscopic septum resection in the course of infertility assessment at our clinic may have conceived naturally after the procedure, but were lost to follow-up or turned to another clinic for ART.

5. CONCLUSION

Treatment following hysteroscopic septum resection, either the consistent or the alternate protocol is both beneficial to improve pregnancy rate. There is no meaningful advantage between two adjacent postoperative hormone therapies on pregnancy rate. We have shown that hysteroscopic septum resection to remove a uterine septum in women with infertility is safe and...
may be an efficacious procedure. However, the need remains for larger randomized controlled trials and prospective studies with enough samples with no intervention and consistent follow-up data to address the effectiveness and safety of adjunct therapy with hysteroscopic septum resection.

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REFERENCE:

1. Tomaževič T, Ban-Frangež H, Ribič-Pucelj M, Premr-Sršen T, Verdenik I. Small uterine septum is an important risk variable for preterm birth. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2007; 135(2): 154-157.

2. Chan Y, Jayaprakasan K, Zamora J, Thornton J, Raine-Fenning N, Coomarasamy A. The prevalence of congenital uterine anomalies in unselected and high-risk populations: a systematic review. Human reproduction update. 2011; 17(6): 761-771.

3. Shokeir T, Abdelshaheed M, El-Shafie M, Sherif L, Badawy A. Determinants of fertility and reproductive success after hysteroscopic septoplasty for women with unexplained primary infertility: a prospective analysis of 88 cases. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2011; 155(1): 54-57.

4. Wang S, Shi X, Hua X, Gu X, Yang D. Hysteroscopic transcervical resection of uterine septum. JLS. 2013 Oct-Dec; 17(4): 517-520.

5. Valle RF, Ekpo GE. Hysteroscopic metroplasty for the septate uterus: review and meta-analysis. Journal of minimally invasive gynecology. 2013; 20(1): 22-42.

6. Güven D, Bakay K, Kuruoğlu S, Özdemir A. Hysteroscopic septum resection in patients with recurrent abortions and infertility. Open Journal of Obstetrics and Gynecology. 2012; 2: 262.

7. Ozyer S, Uzunlar O, Ozcan N, Yesilyurt H, Karayakin R, Sarıgin A, et al. Endometriomas in adolescents and young women. J Pediatr Adolesc Gynecol. 2013 Jun; 26(3): 176-179.

8. Kilic Y, Bastu E, Ergun B. Validity and efficacy of office hysteroscopy before in vitro fertilization treatment. Arch Gynecol Obstet. 2013 Mar; 287(3): 577-581.

9. Mollo A, De Francescis P, Colacurci N, Cobellis L, Perino A, Venezia R, et al. Hysteroscopic resection of the septum improves the pregnancy rate of women with unexplained infertility: a prospective controlled trial. Fertility and sterility. 2009; 91(6): 2628-2631.

10. Homer HA, Li T-C, Cooke ID. The septate uterus: a review of management and reproductive outcome. Fertility and sterility. 2000; 73(1): 1-14.

11. Zlopaša G, Škrablin S,Kalafatić D, Banović V, Lesić J. Uterine anomalies and pregnancy outcome following hysteroscopic septum metroplasty. International Journal of Gynecology & Obstetrics. 2007; 98(2): 129-133.

12. Hickok LR. Hysteroscopic treatment of the uterine septum: a clinician's experience. American journal of obstetrics and gynecology. 2000; 182(6): 1414-1420.

13. Hollett-Caines J, Vilos GA, Abu-Rafca B, Ahmad R. Fertility and pregnancy outcomes following hysteroscopic septum division. JOGC-TORONTO. 2006; 28(2): 156.

14. Patton PE, Noy M, Lee DM, Hickok LR. The diagnosis and reproductive outcome after surgical treatment of the complete septate uterus, duplicated cervix and vaginal septum. American journal of obstetrics and gynecology. 2004; 190(6): 1669-1675.

15. Pabuçcu R, Gomel V. Reproductive outcome after hysteroscopic metroplasty in women with septate uterus and otherwise unexplained infertility. Fertility and sterility. 2004; 81(6): 1675-1678.

16. Parsanezhad ME, Alborzi S, Zarei A, Dehbashi S, Shirazi LG, Rajaeefard A, et al. Hysteroscopic metroplasty of the complete uterine septum, duplicate cervix, and vaginal septum. Fertility and sterility. 2006; 85(5): 1473-1477.

17. Grimbizis GF, Camus M, Tarlatzis BC, Bontis JN, Devroey P. Clinical implications of uterine malformations and hysteroscopic treatment results. Human reproduction update. 2001; 7(2): 161-174.

18. Porcu G, Cravello L, D’Ercole C, Cohen D, Roger V, de Montgolfier R, et al. Hysteroscopic metroplasty for septate uterus and repetitive abortions: reproductive outcome. European Journal of Obstetrics & Gynecology & Reproductive Biology. 2000; 88(1): 81-84.

19. Ban-Frangež H, Tomaževič T, Virant-Klun I, Verdenik I, Ribič-Pucelj M, Bokal EV. The outcome of singleton pregnancies after IVF/ICSI in women before and after hysteroscopic resection of a uterine septum compared to normal controls. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2009; 146(2): 184-187.

20. Nouri K, Ott J, Huber JC, Fischer E-M, Stögbauer L, Tempfer CB. Reproductive outcome after hysteroscopic septoplasty in patients with septate uterus-a retrospective cohort study and systematic review of the literature. Reproductive Biology and Endocrinology. 2010; 8(1): 52.

21. Venturoli S, Colombo F, Vianello F, Scaraccioli R, Possati G, Paradisi R. A study of hysteroscopic metroplasty in 141 women with a septate uterus. Archives of gynecology and obstetrics. 2002; 266(3): 157-259.

22. Doridort V, Gervaise A, Taylor S, Frydman R, Fernandez H. Obstetric outcome after endoscopic transection of the uterine septum. The Journal of the American Association of Gynecologic Laparoscopists. 2003; 10(2): 271-275.

23. Favier E, Fernandez H, Defieux X, Gervaise A, Frydman R, Levallant JM. Accuracy of three-dimensional ultrasonography in differential diagnosis of septate and bicornuate uterus compared with office hysteroscopy and pelvic magnetic resonance imaging. Journal of minimally invasive gynecology. 2012; 19(1): 101-106.

24. Chen S-Q, Deng N, Jiang H-Y, Li J-B, Lu S, Yao S-Z. Management and reproductive outcome of complete septate uterus with duplicated cervix and vaginal septum: review of 21 cases. Archives of gynecology and obstetrics. 2013; 287(4): 709-714.

25. Chan Y, Jayaprakasan K, Tan A, Thornton J, Coomarasamy A, Raine-Fenning N. Reproductive outcomes in women with congenital uterine anomalies: a systematic review. Ultrasound in Obstetrics & Gynecology. 2011; 38(4): 371-382.

26. Roy KK, Negi N, Subbaiah M, Kumar S, Sharma JB, Singh N. Effectiveness of estrogen in the prevention of intrauterine adhesions after hysteroscopic septal resection: A prospective, randomized study. Journal of Obstetrics and Gynaecology Research. 2014; 40(4): 1085-1088.

27. Abu Rafca BF, Vilos GA, Oraif AM, Power SG, Cairns JH, Vilos AG. Fertility and pregnancy outcomes following hysteroscopic resection
Reproductive Outcome Following Hysteroscopic Treatment of Uterine Septum

28. Pabuccu R, Onalan G, Kaya C, Selam B, Ceyhan T, Ornek T, et al. Efficiency and pregnancy outcome of serial intrauterine device–guided hysteroscopic adhesiolsis of intrauterine synchieae. Fertility and sterility. 2008; 90(5): 1973-1977.

29. Tonguc EA, Var T, Yilmaz N, Batioglu S. Intrauterine device or estrogen treatment after hysteroscopic uterine septum resection. International Journal of Gynecology & Obstetrics. 2010; 109(3): 226-229.

30. Cao HB, Tu L, Luo MY, Zhong XI. Exploration of the prevention methods of intrauterine adhesions after TCRS. China Journal of Endoscopy. 2011; 11: 006.

31. Vercellini P, Fedele L, Aimi G, De Giorgi O, Consonni D, Creogian PN. Reproductive performance, pain recurrence and disease relapse after conservative surgical treatment for endometriosis: the predictive value of the current classification system. Human Reproduction. 2006; 21(10): 2679-2685.

32. Buttram V, Gomel V, Siegler A, DeCherney A, Gibbons W, March C. The American Fertility Society classifications of adnexal adhesions, distal tubal occlusion, tubal occlusion secondary to tubal ligation, tubal pregnancies, Mullerian anomalies and intrauterine adhesions. Fertility and sterility. 1988; 49(6): 944-955.

33. Gubbini G, Di Spiezio Sardo A, Nascetti D, Marra E, Spinelli M, Greco E, et al. New outpatient subclassification system for American Fertility Society classes V and VI uterine anomalies. Journal of minimally invasive gynecology. 2009; 16(5): 554-561.

34. Waddell G, Desindes S, Takser L, Beauchemin M, Bessette P. Cervical Ripening Using Vaginal Misoprostol before Hysteroscopy: a Double Blinded Randomized Trial. Journal of minimally invasive gynecology. 2009; 16(5): 1235-1245.

35. Bohllman MK, von Wolff M, Lueddgers DW, Beuter-Winkler P, Diedrich K, Hornemann A, et al. Hysteroscopic findings in women with two and with more than two first-trimester miscarriages are not significantly different. Reproductive biomedicine online. 2010; 21(2): 230-236.

36. Florio P, Imperatore A, Litta P, Franchini M, Calzolari S, Angioni P, et al. The use of nomegestrol acetate in rapid preparation of endometrium before operative hysteroscopy in pre-menopausal women. Steroids. 2010; 75(12): 912-917.

37. Batukan C, Ozgun MT, Ozcelik B, Aygen E, Sahin Y, Turkyilmaz C. Cervical ripening before operative hysteroscopy in premenopausal women: a randomized, double-blind, placebo-controlled comparison of vaginal and oral misoprostol. Fertility and sterility. 2008; 89(4): 966-973.

38. Litta P, Spiller E, Saccardi C, Ambrosini G, Caserta D, Cosmi E. Resectoscope or Versapoint for hysteroscopic myomectomy. International Journal of Gynecology & Obstetrics. 2008; 101(1): 39-42.

39. Römer T, Schmidt T, Foth D. Pre- and postoperative hormonal treatment in patients with hysteroscopic surgery. 2004.

40. Kormányos Z, Molnár BG, Pál A. Removal of a residual portion of a uterine septum in women of advanced reproductive age: obstetric outcome. Human Reproduction. 2006; 21(4): 1047-1051.

41. Hadibroto BR. Hysteroscopy for Metroplasty of Uterine Septa and Hypoplastic Uterus. Bersama Kita Maju. 114.

42. Ionescu C, Gheorghiu D, Pacu I, Davitoiu B, Dimitriu M, OP19. 05: Three dimensional echographic evaluation of septate uterus after hysteroscopic septum resection and correlation with pregnancy outcome. Ultrasound in Obstetrics & Gynecology. 2011; 38(S1): 111-112.

43. Ayas S, Gurbuz A, Eskiçırak E, Selcuk S, Alkan A, Eren S. Follow-up and hysteroscopic evaluation of the uterine cavity after hysteroscopic polypectomy. South African Journal of Obstetrics and Gynecology. 2011; 17(1): 10-13.

44. Valli E, Vaquero E, Lazzarin N, Caserta D, Marconi D, Zupi E. Hysteroscopic metroplasty improves gestational outcome in women with recurrent spontaneous abortion. The Journal of the American Association of Gynecologic Laparoscopists. 2004; 11(2): 240-244.

45. Roy K, Singla S, Baruah J, Kumar S, Sharma J, Karmakar D. Reproductive outcome following hysteroscopic septal resection in patients with infertility and recurrent abortions. Archives of gynecology and obstetrics. 2011; 283(2): 273-279.

46. Roy KK, Singla S, Baruah J, Sharma JB, Kumar S, Singh N. Reproductive outcome following hysteroscopic myomectomy in patients with infertility and recurrent abortions. Archives of gynecology and obstetrics. 2010; 282(5): 553-560.

47. Wang J-H, Xu K-F, Lin J, Chen X-Z. Hysteroscopic septum resection of complete septate uterus with cervical duplication, sparing the double cervix in patients with recurrent abortions or infertility. Fertility and sterility. 2009; 91(6): 2643-2649.

48. Rackow BW, Arici A. Reproductive performance of women with mullerian anomalies. Current Opinion in Obstetrics and Gynecology. 2007; 19(3): 229-237.

49. Tongue EA, Var T, Batioglu S. Hysteroscopic metroplasty in patients with a uterine septum and otherwise unexplained infertility. International Journal of Gynecology & Obstetrics. 2011; 113(2): 128-130.

50. Paradisi R, Barzanti R, Natali F, Guerrini M, Battaglia C, Scracchioli R, et al. Hysteroscopic metroplasty: reproductive outcome in relation to septum size. Archives of gynecology and obstetrics. 2013; 1-6.

51. Tomažević T, Ban-Franger H, Virant-Klun I, Verdenik I, Porošek B, Vrtačnik-Bokal E. Septate, subseptate and arcuate uterus decrease pregnancy and live birth rates in IVF/ICSI. Reproductive biomedicine online. 2010; 21(5): 700-705.

52. Corson S, Batzer F. CO2 uterine distention for hysteroscopic septal incision. The Journal of reproductive medicine. 1986; 31(8): 713.

53. Cararach M, Penella J, Ubeda A, Labastida R. Hysteroscopic incision of the septate uterus: scissors versus resectoscope. Human Reproduction. 1994; 9(1): 87-89.

54. Colacurci N, De Placido G, Mollo A, Caravetta C, De Franciscis P. Reproductive outcome after hysteroscopic metroplasty. European Journal of Obstetrics & Gynecology and Reproductive Biology. 1996; 66(2): 147-150.

55. Guarino S, Incandela S, Maneschi M, Vegna G, D’Anna M, Boffini R, et al. Efficiency and pregnancy outcome of serial intrauterine device–guided hysteroscopic adhesiolysis of intrauterine synchieae. Fertility and sterility. 2008; 90(5): 1973-1977.

56. DeCherney A, Russell J, Grabe R, Polan M. Resectoscopic management of mullerian fusion defects. Fertility and sterility. 1986; 45(5): 726-728.

57. Jourdain O, Dabysing F, Harle T, Lajus C, Roux D, Dallay D. Management of septate uterus by flexible hysteroscopy and Nd: YAG laser. International Journal of Gynecology & Obstetrics. 1998; 63(2): 159-162.
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study on the reproductive outcome of the septate uterus corrected by hysteroscopic metroplasty. International Journal of Gynecology and Obstetrics. 2002; 78(1): 59-60.

59. Pace S, Cipriano L, Pace G, Catania R, Montanino G. Septate uterus: reproductive outcome after hysteroscopic metroplasty. Clinical and experimental obstetrics & gynecology. 2005; 33(2): 110-112.

60. Colacurci N, De Franciscis P, Mollo A, Litta P, Perino A, Cobellis L, et al. Small-diameter hysteroscopy with Versapoint versus resectoscopy with a unipolar knife for the treatment of septate uterus: a prospective randomized study. Journal of minimally invasive gynecology. 2007; 14(5): 622-627.

61. Nawroth F, Schmidt T, Freise C, Foth D, Römer T. Is it possible to recommend an ‘optimal’ postoperative management after hysteroscopic metroplasty? A retrospective study with 52 infertile patients showing a septate uterus. Acta obstetricia et gynecologica Scandinavica. 2002; 81(1): 55-57.

62. March CM, Israel R. Hysteroscopic management of recurrent abortion caused by septate uterus. American journal of obstetrics and gynecology. 1987; 156(4): 834-842.

63. Perino A, Mencaglia L, Hamoir J, Cittadini E. Hysteroscopy for metroplasty of uterine septa: report of 24 cases. Fertility and sterility. 1987; 48(2): 321.

64. Daly DC, Maier D, Soto-Albors C. Hysteroscopic metroplasty: six years’ experience. Obstetrics & Gynecology. 1989; 73(2): 201-205.

65. Choe J, Bagghish M. Hysteroscopic treatment of septate uterus with Neodymium-YAG laser. Fertility and sterility. 1992; 57(1): 81-84.

66. Fedele L, Arcaiani L, Parazzini F, Vercellini P, Di Nola G. Reproductive prognosis after hysteroscopic metroplasty in 102 women: life-table analysis. Fertility and sterility. 1993; 59(4): 768-772.

67. Marabini A, Gubbini G, Stagnozzi R, Stefanetti M, Filoni M, Bovicelli A. Hysteroscopic metroplasty. Annals of the New York Academy of Sciences. 1994; 734(1): 488-492.

68. Valle RF. Hysteroscopic treatment of partial and complete uterine septum. International journal of fertility and menopausal studies. 1995; 41(3): 310-315.

69. Grimbizis G, Camus M, Clansen K, Tournaye H, De Munck L, Devroye P. Hysteroscopic septum resection in patients with recurrent abortions or infertility. Human Reproduction. 1998; 13(5): 1188-1193.

70. Yang J, Yin TU, Xu WM, Xia LG, Li AB, Hu J. Reproductive outcome of septate uterus after hysteroscopic treatment with neodymium: YAG laser. Photomedicine and Laser Therapy. 2006; 24(5): 625.

71. Sendag F, Mermer T, Yucebilgin S, Oztekin K, Bilgin O. Reproductive outcomes after hysteroscopic treatment for uterine septum. Clinical and experimental obstetrics & gynecology. 2009; 37(4): 287-289.

72. Jakiel G, Robak-Cholubek D, Przytula-Pilat M, editors. Two-year studies of women with fertility problems following uterine septum hysteroscopic treatment. Annales Universitatis Mariae Curie-Sklodowska Sectio D: Medicina; 2003.

73. Römer T, Lober R. Hysteroscopic correction of a complete septate uterus using a balloon technique. Human Reproduction. 1997; 12(3): 478-479.