

Original research article

Outcome of intrauterine pregnancies with intrauterine device in place and effects of device location on prognosis[☆]

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Abstract

Objectives: This study aimed to compare the outcome of pregnancies with retained or removed intrauterine devices (IUDs) and the effect of IUD location on pregnancy outcome.

Study design: In a retrospective cohort study, we searched 27,578 records of women who had CuT380 IUD inserted, and 144 pregnancies with IUD were analyzed. IUDs were removed from 114 patients and retained for 30 patients.

Results: The combined risk of adverse pregnancy outcomes (miscarriage, intrauterine fetal death, intrauterine growth retardation, preterm birth and preterm premature rupture of membranes) was 36.8% in the IUD-removed group and 63.3% in the IUD-retained group [$p < .01$; relative risk (RR)=2.0; 95% confidence interval (CI) 1.3–3.3]. Newborns of the IUD-retained women had significantly lower Apgar scores and significantly higher admission rate to the neonatal intensive care unit ($p < .01$; RR=10.8; 95% CI 1.04–111.6 and $p < .01$; RR=4.5; 95% CI 1.5–12.9, respectively). There were more miscarriages and adverse pregnancy outcome when the IUD was retained (16.9% vs. 66.7%) in patients with an IUD in low-lying position ($p < .01$; RR=3.9; 95% CI 1.8–8.6).

Conclusion: Women who conceived with an IUD in place and chose to continue the pregnancy without removing the IUD need close follow-up, as there appears to be higher risk of adverse pregnancy and neonatal outcome. Furthermore, when the IUD is retained in the low-lying position, there is increased risk of miscarriage and adverse pregnancy outcome compared to removal of the IUD. Future randomized controlled studies are needed to determine the outcome of pregnancies with retained or removed IUD.

Implications: In this study, we have evaluated the IUD location and its effect on pregnancy outcome in women with a retained or removed IUD. This study is the first to investigate the relationship between IUD location and pregnancy outcome in women who conceived with an IUD. We need evidence from a collaborative multicenter randomized trial to answer the question of whether the IUD should be removed in case of pregnancy.

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1. Introduction

Intrauterine devices (IUDs) are widely used, safe and effective contraceptives. IUDs are the fifth most used modern contraception method in the United States [1] and the second most used method worldwide, while IUDs are the

first most used modern method (17%) after the traditional withdrawal method (26%) in Turkey [2]. Pregnancy can occur rarely, despite the presence of an IUD. The failure rate of this contraceptive method ranges from 0.8% to 2.3% [3–6]. Studies investigating why pregnancies occur despite the presence of an IUD suggested composition of IUD (copper surface area), duration of use, IUD position, age of women, history of expulsion and failure of the IUD as risk factors for the efficacy of IUD [7–9]. Some authors have suggested removing the IUD during the first trimester of pregnancy to prevent septic complications and miscarriages [10,11]. A retrospective study has shown that ongoing

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pregnancies with a retained IUD have risks, such as preterm delivery and chorioamnionitis [12]. However, randomized controlled studies comparing different management strategies of pregnancies with an IUD in place are needed.

The World Health Organization (WHO) has made a recommendation for pregnancies in the presence of an IUD which is mostly based on studies from the 1970s and 1980s [13]. WHO concluded that removing the IUD improves pregnancy outcome if the IUD strings are visible or can be retrieved safely from the cervical canal and that the risks of miscarriage, preterm delivery and infection are substantial if the IUD is left in place [3]. As there are no randomized controlled studies about pregnancies with IUD; studies with large case series are useful to estimate the outcome of such pregnancies.

This study aimed to evaluate the pregnancy outcomes of women who conceived despite the presence of CuT380A IUD and decided to continue the pregnancy. We have evaluated the IUD location and its effect on pregnancy outcome in both IUD-retained and -removed women. A detailed search of literature showed that there are no studies investigating the relationship between IUD location and pregnancy outcome in women who conceived with an IUD.

2. Materials and methods

A retrospective cohort study was conducted between 01 January 2005 and 01 January 2012 in the Family Planning Unit of Zekai Tahir Burak Women Health Care, Education and Research Hospital, Ankara, Turkey. The study was approved by the institutional review board. In our clinical practice, patients found to be pregnant during the examination are offered to remove the IUD if the strings are visible. Routine ultrasound examination is performed for IUD location. The IUD is removed by gently pulling the thread (in accordance with WHO recommendations) from the patients in whom the IUD tail is still visible [3]. If the thread is inaccessible, no attempt is made to remove the IUD. Clinical records of family planning unit during the study period have been searched. All of the IUDs were CuT380A. Clinical patient characteristics, such as maternal age, obstetric history, gestational age and medical history were evaluated. Early pregnancy losses were recorded, and the ongoing pregnancy outcomes were evaluated for mode of delivery, birth weight, 5-min Apgar scores, admission to neonatal intensive care unit (NICU) and obstetric complications. We also analyzed the maternal serum C-reactive protein (CRP) level, white blood cell count (WBC) and fibrinogen level as markers of the inflammatory response.

The statistical software package SPSS (SPSS Inc., Chicago, IL, USA) was used for the statistical analyses. Whether the distributions of continuous and discrete variables were normal or not was determined by using the Kolmogorov–Smirnov test. Differences between the groups

were evaluated by using the Kruskal–Wallis test. For categorical comparisons, two-tailed Pearson χ^2 tests were used. Statistical significance was calculated using the *t* test for differences in continuous variables. A *p* value less than .01 was considered to be statistically significant.

3. Results

During the study period, 27,578 patients were seen in the family planning unit for examination of an IUD. The cohort consisted of 174 patients who had an IUD at the time of pregnancy diagnosis and did not want the termination of the pregnancy. Fourteen patients were excluded after the diagnosis of an ectopic pregnancy. Patients with IUD expulsion before the diagnosis of pregnancy were not included in the study. Except for 16 patients, all the remaining patients were routinely followed up at our hospital. The outcomes for these 16 patients could not be retrieved. Thus, the cohort consisted of the remaining 144 patients. All of the pregnancies were singleton. Moreover, 114 patients had chosen the IUD to be removed during the first trimester, and the IUD was retained in the remaining 30 patients. The clinical characteristics are summarized in Table 1. There was no significant difference between the groups in terms of age and parity. The mean gestational age at the time of diagnosis was 7.4 ± 2.6 weeks for the IUD-removed group and 8.7 ± 3.8 weeks for IUD-retained group ($p=.1$).

Table 1 shows 73 patients (64%) in the IUD-removed group and 11 (36.7%) patients in the IUD-retained group delivered at term. The difference between the groups for term pregnancies (deliveries of gestational week ≥ 37 weeks) was significant ($p<.01$) [relative risk (RR): 0.6, 95% confidence interval (CI): 0.4–0.9]. The combined risk of adverse pregnancy outcomes (miscarriage, intrauterine fetal death, intrauterine growth retardation, preterm birth and preterm premature rupture of membranes) was 36.8% ($n=42$) in the IUD-removed group and 63.3% ($n=19$) in the IUD-retained group ($p<.01$) (RR: 2.0, 95% CI: 1.3–3.3) (Table 1). Eighteen (15.8%) pregnancies in the IUD-removed group and 8 (26.7%) pregnancies in the IUD-retained group were complicated by vaginal bleeding during the first trimester ($p=.2$) (RR: 1.7, 95% CI: 0.8–3.5). The outcome of patients experienced first trimester bleeding is presented in Table 1. There was no statistically significant difference in terms of intrauterine growth retardation (IUGR), oligohydramnios and preterm premature rupture of membranes (PPROM) between the two groups (Table 1). There were no women with clinically diagnosed chorioamnionitis.

The median gestational week at birth for the IUD-removed group was 39 weeks and was 37.5 weeks for the IUD-retained group ($p<.01$). There was no statistically significant difference between the groups in terms of mode

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