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# Evaluation of risk factors for intrauterine device failure

## *Rahim içi araç başarısızlığı için risk faktörlerinin değerlendirilmesi*

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**Abstract**

**Aim.** The aim of this study was to detect the relationship between IUD failure and some factors such as length of tail, IUD experience, education level, utilization period, gravidy, parity, age and length of uterine cavity. **Methods.** Our study groups included 48 patients who were randomly admitted to our clinic for problematic IUD and 30 normal patients without any complaints who were admitted to our clinic with out of date IUD who wanted new IUD insertion or desired to become pregnant as control group. Both groups were evaluated for the demographic characteristics such as education level, history of abortion, menstrual regulation, and type of delivery, IUD experience and blood count, duration of IUD use, length of tail, type of IUD, and length of uterine cavity. **Results.** We detected statistically significant results for length of cavity, length of tail, education level and IUD experience. **Conclusion.** We are in the opinion that length of uterine cavity, length of IUD tail, educational level and IUD experience are associated with IUD failure.

**Keywords:** Contraception, intrauterine devices, copper

**Özet**

**Amaç.** Bu çalışmanın amacı RİA kullanımında başarısızlık ile rahim kavite uzunluğu, eğitim seviyesi, RİA ipinin uzunluğu, kullanım süresi, RİA tecrübesi, gravida, parite ve yaş gibi bazı faktörlerin ilişkisinin incelenmesidir. **Yöntemler.** Kliniğimize rastgele başvuran problemli spirali olan 48 hasta bizim çalışma gurubumuzu oluşturmuştur ve hiçbir yakınması olmayan spiralinin günü geçtiği için yeni spiral isteyen veya bebek yapmayı planlayan 30 hasta kontrol gurubumuzu oluşturmuştur. Her iki gurup demografik özellikler, eğitim seviyesi, düşük öyküsü, adet düzeni, doğum şekli, RİA tecrübesi ve kan sayımı, spiralin kullanım süresi, tipi, kuyruk uzunluğu ve rahim kavitesinin uzunluğu açısından karşılaştırılmıştır. **Bulgular.** RİA ipinin uzunluğu, kavite uzunluğu, eğitim seviyeleri ve RİA tecrübesi açısından istatistiksel olarak anlamlı sonuçlar saptadık. **Sonuç.** Biz RİA ipinin uzunluğu, kavite uzunluğu, eğitim seviyeleri ve RİA tecrübesinin spiral kullanımındaki başarısızlıkla ilişkili olduğu düşüncesindeyiz.

**Anahtar sözcükler:** Kontrasepsiyon, rahim içi araç, bakır

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## Introduction

For many years, the intrauterine device (IUD) has been a contraceptive choice for

women. Utilized by more than 150 million women worldwide, especially in the form of the copper IUD, these devices are the generally used method of reversible contraception and are second only to female sterilization as the most common form of birth control overall. Today, there are 2 types of IUDs, copper and progestin, which have reemerged as effective, safe, and acceptable methods of contraception [1, 2]. 13.6% of couples around the world have selected the IUD for birth control. Utilization rates can vary from country to country. IUD use is detected high (14.5%) in less developed countries and low (7.6%) in more developed countries [2]. Copper IUDs are typically T-shaped or are composed of frameless devices that are anchored to the myometrium at the uterine fundus [3]. The Copper T-380A, named for the 380 $mm^2$ of copper surface area, is the most commonly used IUD around the world [1]. The most common adverse effects of IUDs include cramping, abnormal uterine bleeding, and expulsion [4-6]. Adverse effects related specifically to the hormone releasing IUD include amenorrhea, acne, depression, weight gain, decreased libido, and headache. First-year failure rates were reported to be between 1 and 2 percent [7]. Up to 50% of women stop using IUDs within 5 years, most often because of unacceptable vaginal bleeding or pain [8]. The frequency of removals for bleeding problems (including amenorrhea) is similar in copper IUD users and the levonorgestrel intrauterine system (LNG-IUS) users: 14% in copper T users and 11% in LNG-IUS users after 36 months of use [9]. The aim of this study was to detect the relationship between IUD failures and some factors such as length of tail, IUD experience, education level, utilization period, gravidy, parity, age and length of uterine cavity.

## Materials and method

Forty-eight patients with IUD failure, diagnosed at Kayseri Education and Training Hospital, between June 2010 and May 2011 and 30 completely normal women using IUDs without any complaints such as cramping, abnormal uterine bleeding and amenorrhea were included in this prospective analysis. 48 patients constituted our study group and 30 patients constituted our control group. Both groups were discussed for the demographic characteristics such as education level, history of abortion, menstrual regulation, and type of delivery, IUD experience and blood count, duration of IUD use, length of tail, type of IUD, and length of uterine cavity. Our study group included 50 patients who were randomly admitted to our clinic for problematic IUD but two of these were excluded from the study because of extrauterine IUD and 30 normal patients without any complaints who were admitted to our clinic with out of date IUD and wanted new IUD insertion or desired to become pregnant. All the patients in study group underwent the same diagnostic investigations, which included pregnancy test, standard gynecologic examination, transvaginal sonography (TVS) and abdominopelvic X-ray in anterior-posterior and lateral position. In study group, some of the patients IUD strings were not observed during vaginal examination or patients claimed for complications of IUDs such as cramping, abnormal uterine bleeding and amenorrhea etc. Those IUDs were removed according to World Health Organization recommendation that a displaced IUD should always be removed as soon as possible after the diagnosis has been established, regardless of its type and location [10]. All the patients' IUDs were in uterine cavity and surgical procedures were carried out under local anesthesia by the same specialist. The study was approved by the institutional ethics committee and all participants signed an informed consent form regarding both surgical procedure and anesthetic technique. The demographic characteristics, duration of IUD use, length of tail, type of IUD and length of uterine cavity were recorded in both groups.

### *Statistical analysis*

All the analyses were performed using SPSS 15.0 (SPSS Inc., Chicago, III., USA) package program. Data were expressed as frequencies and percentages for categorical variables and median and quartiles for continuous variables. Shapiro-Wilk's test was used to check the normality assumption. Differences between groups were evaluated using

Chi-square analysis for categorical variables and Mann-Whitney U test for continuous variables. P values <0.05 were considered statistically significant.

## Results

All of the patients in both groups were multiparous. There was no statistically significant difference between groups for age, number of pregnancies and number of living children (p>0.05). In control group all IUDs were removed by the way of ring forceps and patients did not require local anesthesia. Two of the patients in study group were excluded from study because of extrauterine migration. These patients were treated surgically with laparoscopy under general anesthesia. We detected statistically significant results for length of cavity, length of tail, education level and IUD experience. We were not able to illustrate relationship between IUD failure and other factors. Study results are summarized in table 1. We detected short uterine cavity and IUD tail in study group, additionally they had low educational level and small percentage of this group had experience for IUD.

**Table 1. Evaluation of two groups for demographic characteristics, duration of IUD use, length of tail, type of IUD, blood count and length of uterine cavity.**

| Variables | Study group n=48 | Control group n=30 | p value |
|---|---|---|---|
| **Type of delivery** | | | |
| Caesarean section | 5 (%10.4) | 9 (%30) | 0.059 |
| Vaginal delivery | 43 (%89.6 ) | 21 (%70) | |
| **Education level** | | | |
| Primary school | 29 (%60.4) | 5 (%16.7) | |
| Junior high school | 2 (%4.2) | 5 (%16.7) | <0.001 |
| High school | 4 (%8.3) | 14 (%46.7) | |
| College | 1 (%1.3) | 3 (%3.8) | |
| **Abortion history** | | | |
| Yes | 5 (%10.4) | 8 (%26.7) | 0.118 |
| No | 43 (%89.6) | 22 (%73.3) | |
| **Menstrual regulation** | | | |
| Irregular | 14 (%29.2) | 10 (%33.3) | 0.892 |
| Regular | 34 (%70.8) | 20 (%66.7) | |
| **IUD experience** | | | |
| Yes | 6 (%12.5) | 26 (%86.7) | <0.001 |
| No | 42 (%87.5) | 4 (%13.3) | |
| **Type of IUD** | | | |
| Cooper | 44 (%91.7) | 30 (%100) | |
| Lippes loop | 2 (%4.2) | 0 | 0.268 |
| Multiload | 2 (%4.2) | 0 | |
| **Duration of IUD Use (year/s)** | 6.96±5.00 | 5.25±4.77 | 0.095 |
| **Length of Tail (cm)** | 1.42±1.70 | 5.20±1.20 | <0.001 |
| **Length of Uterine Cavity (cm)** | 7.71±0.43 | 8.50±0.82 | <0.001 |
| **Hematocrit** | 38.30±4.26 | 38.77±4.84 | 0.666 |
| **Platelets** | 282.39±75.89 | 289.96±78.58 | 0.655 |
| Mean ± standard deviation, n (%) | | | |

## Discussion

For many years, IUD has been popular and most widely used reversible family planning method among women around the world. The total number of current IUD users is estimated to be over 150 million women worldwide [11, 12]. A study which was carried out in Turkey illustrated that IUD is also preferred by 19% of Turkish women who use contraceptive methods. According to a study in the early postpartum period 24.6% of women's contraceptive method choice was IUD, in Turkey [13]. The copper IUD which is safe, immediately reversible, long term and very effective and acceptable method of contraception and does not interfere with intercourse, is not subject to forgetfulness, and once inserted, does not interact with medications. Moreover, it is also nonhormonal, so it

does not have any hormone-related side effects or contraindications, and it does not affect breastfeeding. There is also no evidence to suggest that the copper IUD is associated with weight gain, altered libido, or mood changes [14, 15]. Although the effectiveness of IUDs is excellent, they may have some adverse events associated with IUD use, including perforation and an increased infection immediately following insertion [15]. All types of copper IUDs are also associated with an increased volume of menstrual blood loss and dysmenorrhoea [16]. Therefore, bleeding and dysmenorrhea are the most common reasons for copper IUD discontinuation. In the first year of use, between 4% and 15% of women using a Copper T-380A will have it removed for these reasons [6, 17]. An IUD should be removed at the expiration date, if the patient develops a contraindication or adverse effects are not resolved, or the patient requests. In literature, there is no consensus about the consequences of a disproportion between IUD size and the uterine cavity. In our study, we observed significant relationship between length of uterine cavity and IUD failure ($p<0.001$). In a study, Akkuzu G. et al. [18] revealed that IUD discontinuation rates were higher in postpartum period compared with interval period. These findings agree with those reported by Castro. Castro A et al. [19] studied the endometrial cavity length of women prior to the insertion of a MLCu375 IUD. Results of the cavimetries were correlated to IUD complications to determine which uterine sizes were associated with IUD side-effects. The expulsion rate was higher for women with an endometrial cavity length equal to or greater than 45 mm ($p<0.01$) for one or two years. On the other hand, Bahamondes MV et al. [20] evaluated the correlation between endometrial cavity length and expulsion rate in acceptors of the TCu380A intrauterine device (IUD) or the levonorgestrel-releasing intrauterine system (LNG-IUS). Their results do not support the hypothesis of an association between uterine length and risk of intrauterine contraceptive expulsion [20]. In a study, when cases were compared to nonpregnant controls with IUD, the results showed that uterine position and hysterometric measurements were not associated with an increased risk of pregnancy. The findings suggest that these two gynecological characteristics of the women analyzed should not be a criterion for the selection of potential IUD users [21]. Different types of studies and materials led to different results. All these data and this study prove that there is no consensus among authors. Although we did not declare an appropriate length for IUD use, there appears to be a relationship between IUD failure and a critical uterine cavity length. Other significant finding of our study is the relation of IUD failure with the absence of previous IUD experience and length of IUD tail. Jenabi et al. [22] showed that women who had previously used an IUD had lower continuation rates because of spotting and hemorrhage than did women without previous IUD experience. In the medical literature, no relationship was observed between the risk of IUD failure and educational level although we observed that IUD failure was related with lower level of education (primary school) ($p<0.001$) [23].

Women, who had previously satisfactory IUD experience, may have a tendency to re-use IUD. Additionally, some of the patients with low educational status have never returned to their IUD controls. This situation results in nonobservable IUD tail or IUD failure. In our study, no significant differences were observed regarding type of delivery, menstrual regulation, history of abortion, and type of IUD, duration of IUD use, hematocrit and platelet levels, among the two groups with and without IUD failure. We are in the opinion that length of uterine cavity, length of IUD tail, educational level and IUD experience are associated with IUD failure.

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