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Menstrual Pattern Changes Following Laparoscopic Sterilization

A Comparative Study of Electrocoagulation and the Tubal Ring in 1,025 Cases

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This investigation compared the effects of the laparoscopic occlusive techniques of unipolar electrocoagulation and the tubal ring on subsequent menstrual patterns. The question of whether sterilization, in general, causes menstrual pattern changes is also addressed. The 1,025 cases constituted a data set collected by investigators at five institutions in five countries. After controlling for prior contraceptive use, the two techniques were compared with respect to menstrual cycle regularity, cycle length, flow

duration, amount of flow, dysmenorrhea and intermenstrual bleeding. In this series, approximately 10% to 50% (depending on the menstrual parameter) of the menstrual pattern changes seen within six months following sterilization could be attributed to the discontinuation of the Pill or IUD at the time of sterilization. The majority of the women experienced no menstrual pattern changes following sterilization. There was no statistically significant difference between the two occlusion techniques in terms of the proportion of women who reported changes in any of their menstrual parameters. The theory that sterilization causes menstrual pattern changes rests on the hypothesis that the greater the degree of destruction of the uteroovarian vascular anastomosis (as with unipolar electrocoagulation), the greater the amount of subsequent menstrual pattern disturbance. Our findings suggest that this hypothesis is not valid.

Introduction

Voluntary sterilization has become the single most prevalent method of fertility regulation in many countries and seems likely to become even more important in the future.⁸ In recent years there has been growing concern that sterilization may cause changes in menstrual patterns. The literature on this subject is controversial, and there are studies both supporting and rejecting this theory. Lu and Chun¹² found no difference in menstrual patterns following sterilization but suggested that some alteration in the vascular supply to the ovaries is unavoidable during sterilization and may result in menstrual pattern disturbances. Muldoon¹³ reported that tubal sterilization does cause changes in menstrual patterns. Noble¹⁴ found that both electrocoagulation and ligation and excision of the tube caused menstrual pattern disturbances and that electrocoagulation resulted in greater disturbances. He theorized that electrocoagulation is likely to cause a more severe disturbance of the uteroovarian vascular anastomosis, and therefore this technique would cause greater menstrual changes. Others have found no differences in menstrual patterns following sterilization when prior contraceptive use was accounted for^{4,9,11,15} and when prior menstrual function was considered as well.^{1,5-7,17} Several investigators who have studied changes following electrocoagulation sterilization have reported that few changes were found,^{1,3,5,9,10,16,17} and three of these studies included comparisons of electrocoagulation and the tubal ring.^{9,10,16}

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Most of the studies had methodologic shortcomings. They generally used small, single-center data sets, and it was rarely possible to control for previous contraceptive use. In most cases the data were collected retrospectively and are therefore subject to recall bias.

This report compares the laparoscopic occlusion techniques of unipolar electrocoagulation (504 cases) and the tubal ring (KLI Falope Ring) (521 cases) to determine if they differ with respect to menstrual pattern changes.

Materials and Methods

The International Fertility Research Program (IFRP) has been supporting clinical trials of laparoscopic sterilization since 1971. The 1,025 cases analyzed in this paper were collected by investigators at five institutions in five countries. Women were randomly allocated into the electrocoagulation or tubal ring groups in five comparative studies. Using standardized forms and a similar protocol, clinicians recorded information on the sociodemographic characteristics of the patients as well as relevant clinical aspects of the procedure. Each form was sent to the IFRP, where it was scanned and the data entered into the computer. The evaluation of patients was blind in that the evaluating physician who obtained and recorded the follow-up data was not the operating phy-

sician and did not know which tubal occlusion technique was used.

Both the electrocoagulation and tubal ring study groups consisted of 89% interval and 11% postabortion (first-trimester) women. In all the electrocoagulation cases the unipolar technique was used. The follow-up rates at six months for the electrocoagulation and tubal ring groups were 83% and 84%, respectively. Those women who did not return for the scheduled six-month follow-up were not included in this study. However, the age and parity of those women who did and those women who did not have a long-term follow-up visit were similar in both technique groups.

All the data were collected prospectively. A menstrual history was obtained at the time of admission for sterilization and at the six-month follow-up visit. The women were not asked about menstrual changes; rather, they were asked direct questions on various menstrual parameters for their last three cycles. Postabortion women were asked to consider the three cycles prior to pregnancy. Menstrual pattern changes were determined by computer comparison of menstrual data collected at admission and the follow-up visit. Six menstrual parameters were examined: cycle regularity, cycle length, menstrual flow duration, amount of flow, dysmenorrhea and intermenstrual bleeding.

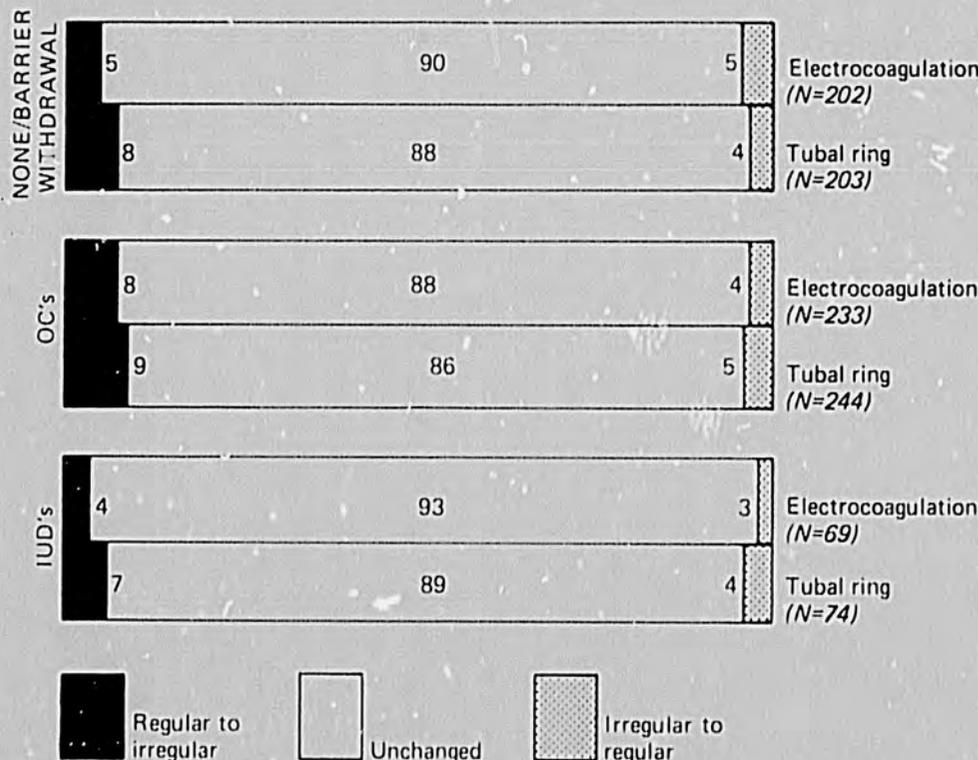


Figure 1 Comparative studies of electrocoagulation and the tubal ring. Percent of women with change in menstrual cycle regularity from admission to six-month follow-up (N=1,025).

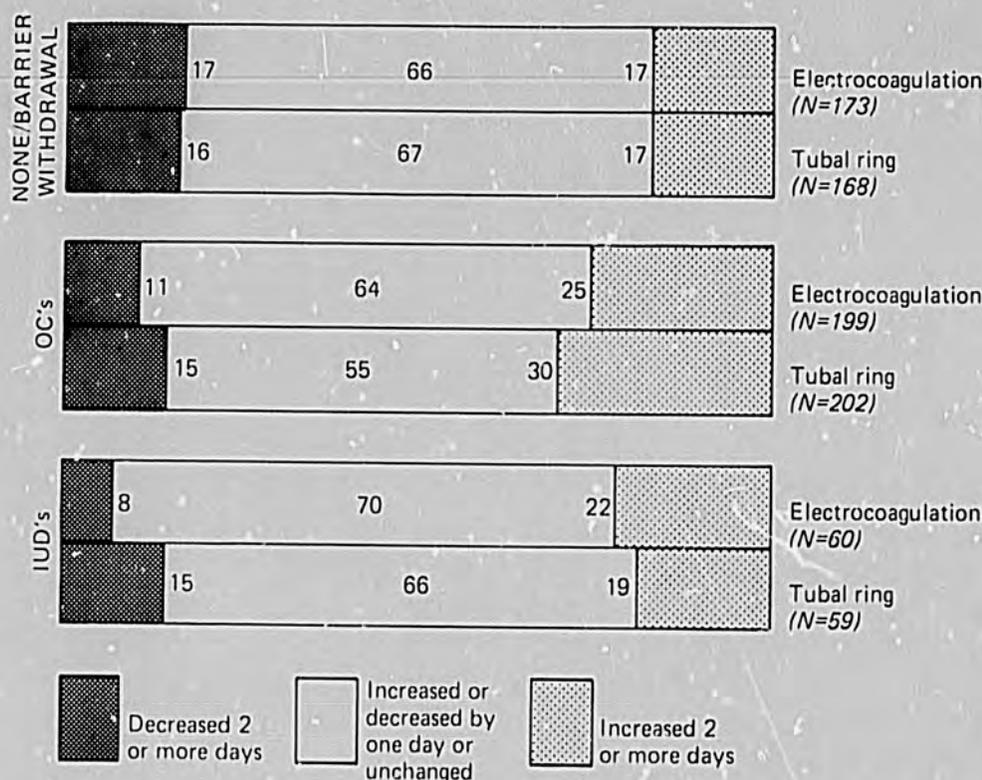


Figure 2
 Comparative studies of electrocoagulation and the tubal ring. Percent of women with change in menstrual cycle length (for those regular at both times) from admission to six-month follow-up (N=861).

The woman was asked to specify the average length of her cycle in days. During analysis, the cycle length data were categorized in the following way: decreased five or more days, decreased two to four days, unchanged \pm one day, increased two to four days and increased five or more days. After examination of this categorization of data by sterilization technique, the first two categories and the last two categories were combined for presentation purposes. The woman was asked whether her cycle was regular or irregular. She was asked to specify the average duration of flow in days. During analysis, the flow duration was categorized in the following way: decreased two or more days, decreased one day, unchanged, increased one day and increased two or more days. After examination of this categorization of data by technique, the upper two categories and the lower two categories were combined for presentation purposes. The woman was asked whether her flow was scanty, moderate or excessive and whether her menstruation was painful; the responses were recorded as none, mild, moderate or severe. Last, she was asked whether she had experienced any intermenstrual bleeding, and the responses were recorded as none, staining/spotting, moderate or severe.

The discontinuation of OCs and IUDs is known to cause a considerable change in menstrual patterns. To control for this effect, both tubal occlusion techniques were stratified by prior contraceptive method using the following categorization: no contraceptive or a barrier method and/or withdrawal method, OCs and IUDs. Each of the six menstrual pattern parameters was examined within this stratification. The difference in the distribution of changes between the electrocoagulation and tubal ring groups was tested for statistical significance ($p < 0.05$) by the Pearson χ^2 test. The none/barrier/withdrawal group was used as a control group to calculate the additional change attributable to discontinuation of the IUD and Pill.

Results

The two groups of women were comparable with respect to age. The mean ages of the electrocoagulation and tubal ring groups were 32.8 and 32.6 years, respectively. The distributions of the ages of the women in the two groups were examined and found to be quite similar.

Each of the six parameters was examined and stratified by the three prior contraceptive use groupings, yielding 18 separate comparisons. The findings are

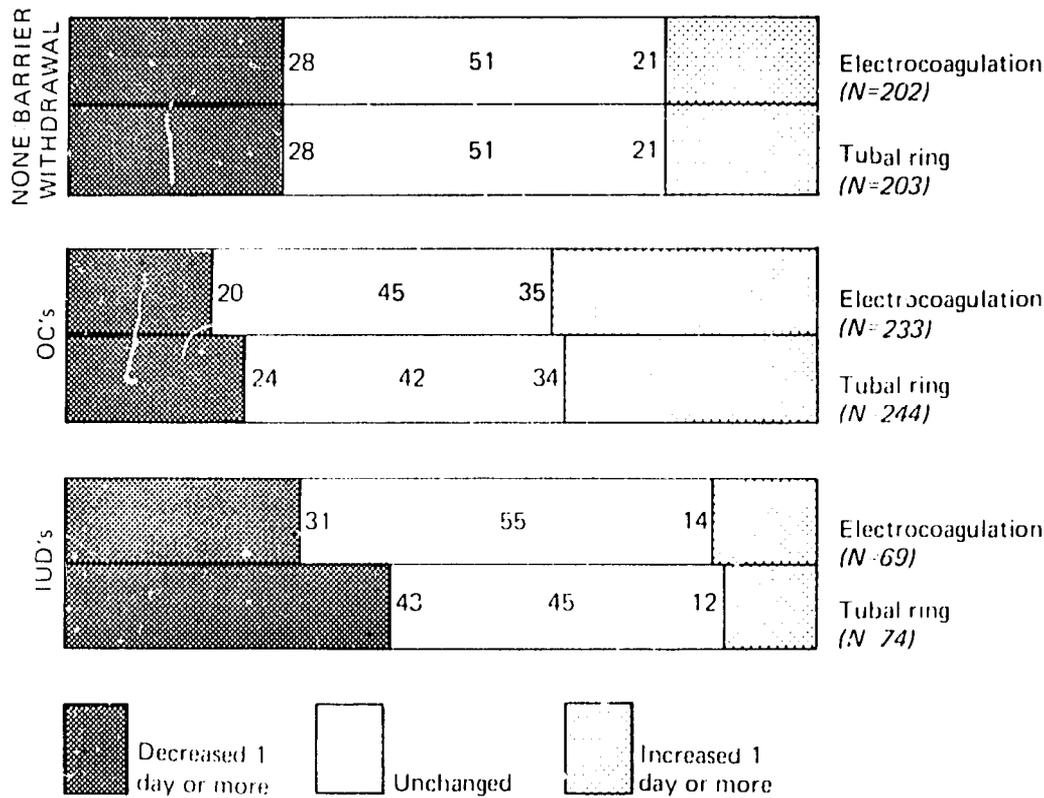


Figure 3
Comparative studies of electrocoagulation and the tubal ring. Percent of women with change in menstrual flow duration from admission to six-month follow-up (N = 1,025).

presented in Figures 1 to 6, which show a remarkable similarity between the electrocoagulation and tubal ring techniques in the proportion of women experiencing menstrual changes during the first six months following sterilization. No significant differences between the electrocoagulation and tubal ring groups were found at the 0.05 level in any of these 18 χ^2 tests.

Examination of all six menstrual parameters within the none barrier/withdrawal group showed that the majority of the women experienced no change. Among those who did experience a change, approximately half the changes were in one direction and the other half in the other direction. In no case were the changes unidirectional.

Changes that might be expected following discontinuation of the Pill were seen—that is, more women experienced an increase in cycle length, flow duration and amount of flow than the converse. Likewise, the expected changes in patterns following discontinuation of IUD use were seen in that more women experienced a decrease in flow duration, amount of flow, dysmenorrhea and intermenstrual bleeding than the converse. For instance, Figure 3 demonstrates that changes in the duration of bleeding occurred approx-

imately equally in both directions among the none/barrier/withdrawal group of women (28% decreased and 21% increased in both the electrocoagulation and tubal ring groups). In former Pill users, however, the preponderance of the changes was towards an increased duration of bleeding (35% increase v. 20% decrease and 34% increase v. 24% decrease in the electrocoagulation and tubal ring groups, respectively). Among discontinuers of the IUD, fewer women experienced an increase rather than a decrease in flow duration (14% increase v. 31% decrease and 12% increase v. 43% decrease in the electrocoagulation and tubal ring groups, respectively).

With the none/barrier/withdrawal group as controls, additional changes as a result of discontinuing the Pill and IUD were calculated for each of the six parameters. In this study it appears that approximately 10% (for dysmenorrhea) to 50% (for intermenstrual bleeding) of the menstrual pattern changes reported following sterilization can be attributed to discontinuation of the Pill or IUD.

Discussion

This study indicates that the more destructive electrocoagulation occlusive technique does not cause

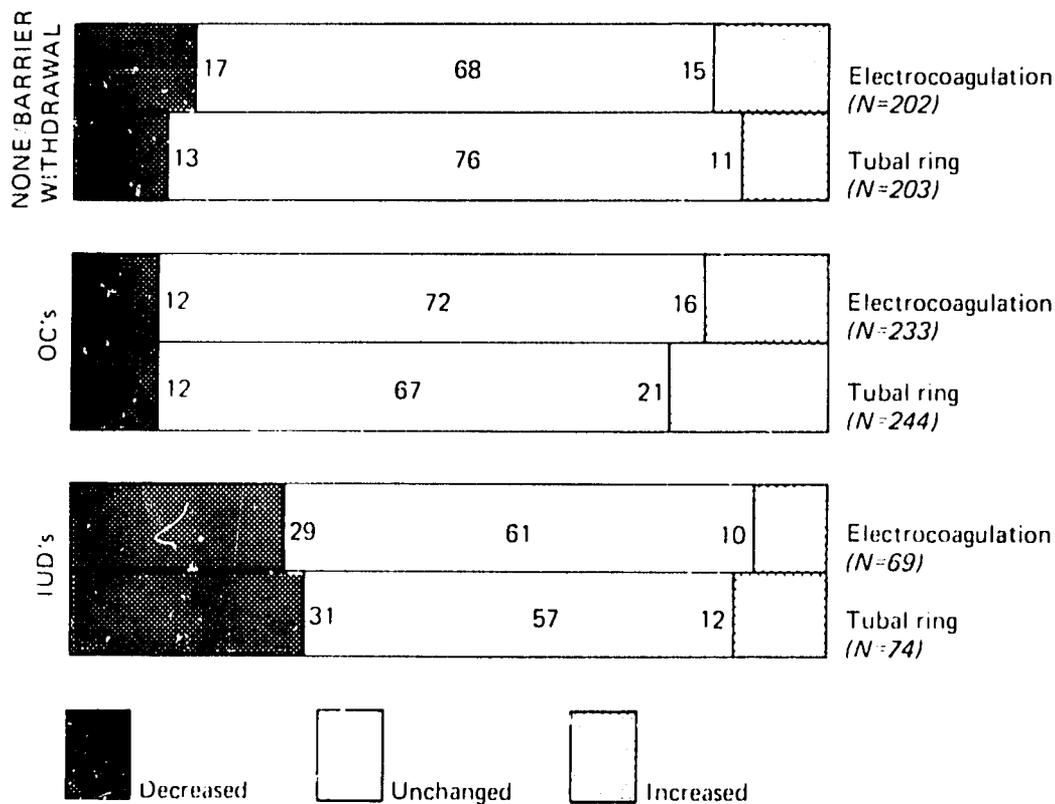


Figure 4
Comparative studies of electrocoagulation and the tubal ring. Percent of women with change in amount of menstrual flow from admission to six-month follow-up (N = 1,025).

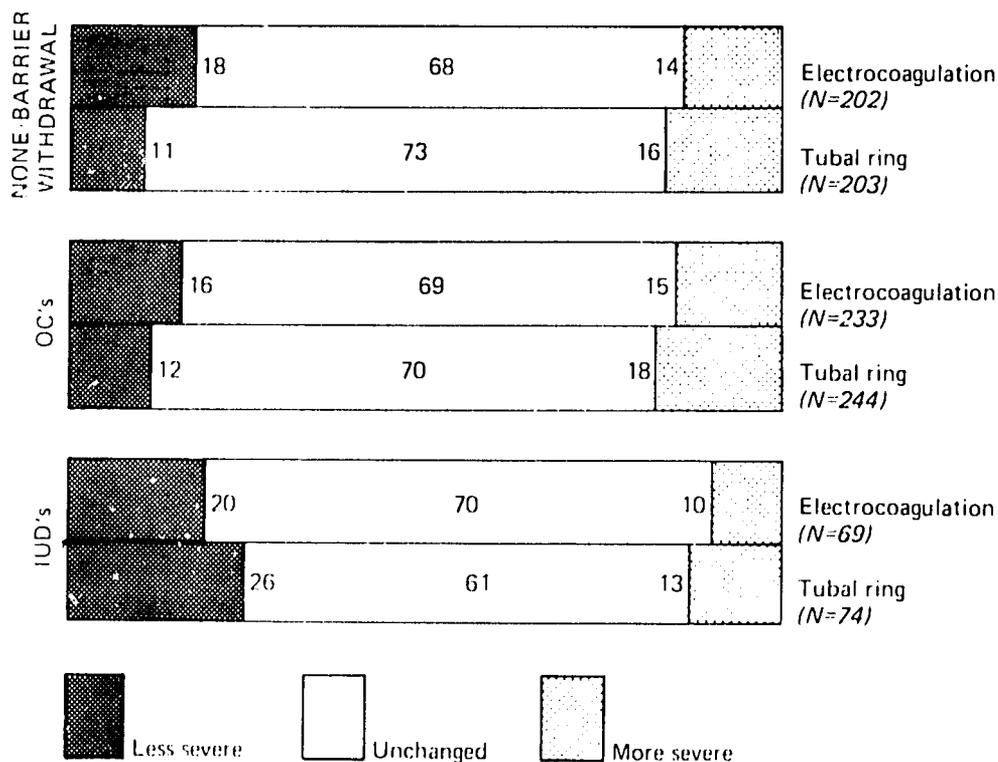


Figure 5
Comparative studies of electrocoagulation and the tubal ring. Percent of women with change in dysmenorrhea severity from admission to six-month follow-up (N = 1,025).

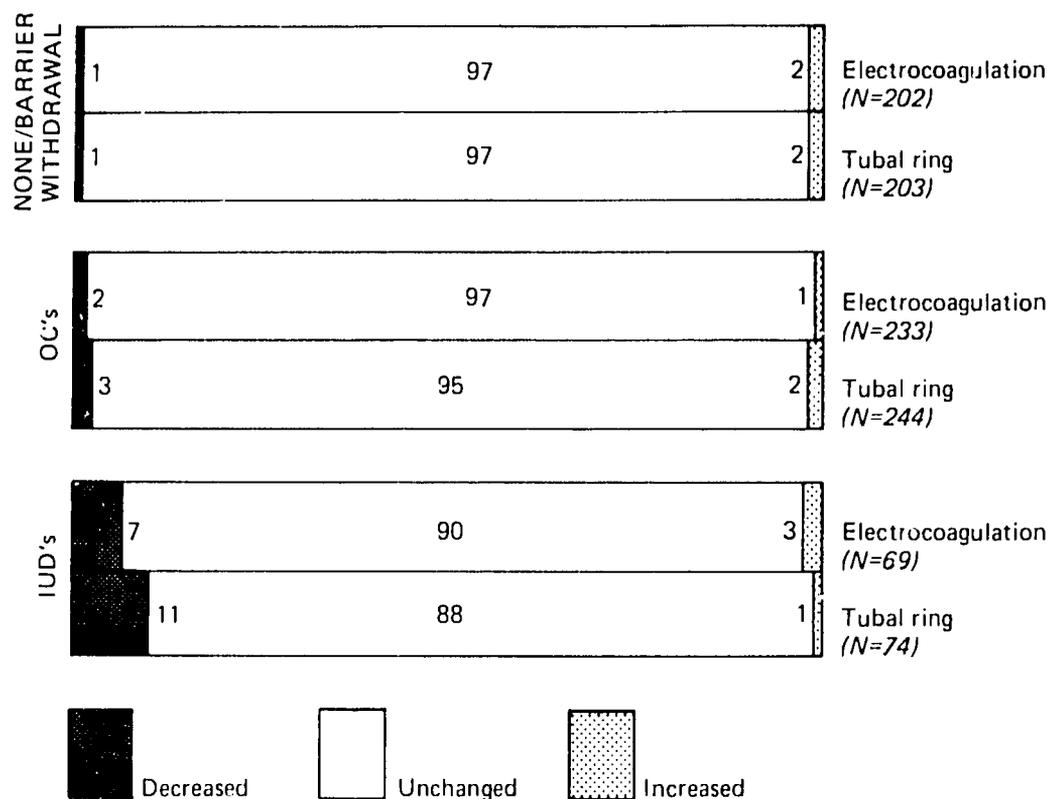


Figure 6
Comparative studies of electrocoagulation and the tubal ring. Percent of women with change in intermenstrual bleeding from admission to six-month follow-up (N = 1,025).

more menstrual pattern changes than does the tubal ring technique. The theory that sterilization causes menstrual pattern changes rests on the assumption that the greater the damage to the uteroovarian vascular anastomosis, the greater the changes in menstrual patterns. Theoretically, unipolar electrocoagulation would cause the greater destruction of the two occlusion techniques studied, yet our data suggest that this technique does not cause more menstrual changes than the tubal ring technique.

In a companion study of 10,004 cases² we compared menstrual pattern changes following laparoscopic sterilization with four occlusion techniques: electrocoagulation, the tubal ring, the prototype spring-loaded clip (prototype Hulka-Clemens) and the Rocket clip. A similar method was used except that the analysis included 12-month follow-up data for all four occlusion techniques and 24-month follow-up data for the electrocoagulation and tubal ring groups. The differences in the proportions of women experiencing change in the different time periods (0 to 6 months, 6 to 12 months and 12 to 24 months) and the cumulation of proportions of women experiencing changes over time (0 to 6 months, 0 to 12 months and 0 to 24 months) were examined. The effects of cultural differences and of age were also examined.

We found that the majority of women do not experience a change in menstrual patterns following sterilization. Among the women who do, about one-third to one-half of the changes can be attributed to the discontinuation of the Pill or IUD. The remaining women experience changes about equally in both directions. The data suggest that in a larger group of women the menstrual patterns are in a constant state of flux, with the proportion of women experiencing change in one direction approximately equaling the proportion of women experiencing change in the opposite direction. Furthermore, this companion study indicates that there are no differences in menstrual pattern changes among the four occlusion techniques studied.

The findings of the study reported here are consistent with and supportive of the companion report, to be published shortly.² Collectively, both studies strongly suggest that laparoscopic sterilization does not cause changes in menstrual patterns.

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