

Reproductive outcome after tubal reversal in women 40 years of age or older*

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Objective: To determine the reproductive outcome of women who received a microsurgical tubal anastomosis operation at age 40 years or older.

Design: Multicenter retrospective cohort study.

Setting: Four university teaching hospitals.

Patients: Fifty-two women having undergone tubal sterilization reversal at age ≥ 40 years.

Main Outcome Measures: Pregnancy and live birth rate.

Results: Of the 52 women, 10 were lost to follow-up. Of those traced, 18 of 42 (42.8%) conceived. Of those 18, 6 patients had a live birth, 10 patients had a first trimester spontaneous abortion, 1 patient had an ectopic pregnancy, and 1 patient had an elective termination. Overall, the live birth rate was 14.3%, spontaneous abortion rate was 23.8%, and ectopic pregnancy rate was 2.4%.

Conclusions: Microsurgical tubal anastomosis is a justifiable alternative to IVF-ET in women age 40 years or older. *Fertil Steril* 1996;65:863-5

Key Words: Tubal reversal, anastomosis, age 40 years, reproductive outcome

There is a marked decrease in fertility during the fifth decade of life. Based on historic estimates, the ability to bear a child in the 40- to 44-year age group is between 40% and 55% lower than in the 35- to 39-year age group (1). Women seeking fertility services, who present with advanced reproductive age and prior tubal sterilization, are often directed to IVF-ET. Although pregnancy rates (PRs) in IVF-ET for

women <40 years of age are encouraging, the 1992 Society for Assisted Reproductive Technology registry for women \geq age 40 years with no male factor reports a 7.2% delivery rate per retrieval (2). Given this, it seems appropriate to determine whether a tubal reversal procedure is justifiable in this age group. The purpose of this report is to provide information on the reproductive outcome of women after a microsurgical tubal anastomosis operation performed at or above age 40 years.

MATERIALS AND METHODS

The medical records of women who received a tubal anastomosis procedure at age ≥ 40 years at the Medical Center Hospital of Vermont, New England Baptist Hospital, Brigham and Women's Hospital, University of North Carolina Hospital, and Yale-New Haven Hospital were reviewed. Over a 15-year period, there were 52 women \geq age 40 years with a documented microsurgical tubal anastomosis operation. Mean age was 41.4 ± 0.28 years (range, 40 to 47 years), gravidity 2.8 ± 0.2 (range, 1 to 7), and

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Table 1 Final Reproductive Outcome by Age at Time of Tubal Reversal in 42 Women

	Age (y) at surgery							Total*
	40	41	42	43	44	46	47	
No. of women conceiving†	8/20	4/7	2/6	2/5	1/2	0/1	0/1	18/42 (42.8)
Live birth	4	1	—	1	—	—	—	6/42 (14.3)
Spontaneous abortion	4	3	1	1	1	—	—	10/42 (23.8)
Ectopic	—	—	1	—	—	—	—	1/42 (2.4)

* Values in parentheses are percents.

† Includes one woman with an elective termination, not shown.

parity 2.2 ± 0.2 (range, 0 to 6). Of the 52 surgeries performed, 38 of 52 (73%) resulted in a bilateral anastomosis, and 14 of 52 (27%) resulted in a unilateral anastomosis. Included in the 38 bilateral procedures were 20 isthmic-ampullary, 8 isthmic-isthmic, 4 cornual-ampullary, 2 cornual-isthmic, 1 cornual-ampullary and isthmic-isthmic, 1 isthmic-isthmic and isthmic-ampullary, 1 ampullary-ampullary and isthmic-ampullary, and 1 woman with a cornual-isthmic and isthmic-ampullary anastomosis. Included in the 14 women with a unilateral procedure were 12 isthmic-ampullary and 2 isthmic-isthmic anastomosis. The type of tubal sterilization procedure was documented in 45 of 52 (86.5%) women and included the Pomeroy technique in 20 (44.4%), monopolar or bipolar coagulation in 15 (33.3%), Falope ring in 6 (13.3%), and Hulka clip in 4 (9%) women. The mean tubal length at completion of surgery was 5.6 ± 0.2 cm (range, 3 to 9 cm). Twenty-three of 52 (44.2%) women had a hysterosalpingogram within 1 year of surgery; all 23 demonstrated bilateral or unilateral patency. A serum cycle day 3 FSH was recovered in 18 of 52 (34.6%) women with a mean value of 6.1 ± 0.6 mIU/mL and range that extended from 1.9 to 10.9 mIU/mL (conversion factor to SI unit, 1.00). The mean time between tubal sterilization and anastomosis was 8.4 ± 0.8 years (range, 1 to 19 years). Follow-up was based on studying the hospital records for evidence of subsequent pregnancy, private physicians were contacted, and patients were contacted by telephone. Conception and nonconception women were compared using *t*-tests with respect to age, tubal length, and time between tubal sterilization and reversal. Statistical significance was determined using $\alpha = 0.05$.

RESULTS

Ten of the 52 women identified as having undergone a tubal reversal procedure at or above age 40 years were lost to follow-up. Of those traced, 18 of 42 (42.8%) conceived with a mean follow-up time of 5.1 ± 0.6 years (range, 8 months to 8 years). Of these 18, 6 women ultimately had a live birth, 10 women had a first trimester spontaneous abortion, 1 woman

had an ectopic pregnancy, and 1 woman had an elective termination. Two women had two live births each, 1 woman had a spontaneous abortion followed by a live birth, 1 woman had an elective termination followed by a live birth, and 1 woman had three spontaneous abortions. The mean time to first clinical pregnancy was 12.6 ± 1.6 months (range, 3 to 24 months). No conception occurred in women whose surgery occurred after age 44 years, no live births occurred when surgery was performed beyond the age of 43 years, and the oldest age at the time of delivery was 45 years. Pregnancy outcome for each age group is detailed in Table 1.

There were no differences between age (41 ± 0.34 versus 41.7 ± 0.36 years (mean \pm SEM)), tubal length (5.7 ± 0.2 versus 5.6 ± 0.2 cm), or time from tubal sterilization to reversal (7.3 ± 0.6 and 8.1 ± 0.8 years) between conception patients and patients who did not conceive. Within the conception group, the tubal ligation procedures included the Pomeroy technique ($n = 7$), coagulation ($n = 8$), Falope ring ($n = 1$), and Hulka clip ($n = 1$). Three of 9 (33.3%) women conceived after a unilateral isthmic-ampullary procedure. Fifteen of 33 (45.5%) conceived after a bilateral procedure. In these women, the site of anastomosis included: isthmic-ampullary ($n = 8$), isthmic-isthmic ($n = 2$), cornual-isthmic ($n = 2$), isthmic-isthmic and isthmic-ampullary ($n = 1$), ampullary-ampullary and isthmic-ampullary ($n = 1$), and cornual-ampullary and isthmic-isthmic ($n = 1$).

DISCUSSION

There is little guidance in the current literature on the results that can be expected from tubal reversal procedures performed on women of advanced reproductive age. Our results of a 40.5% intrauterine PR and 2.4% ectopic PR are comparable with the findings of Trimbos-Kemper (3) who reports a 45% intrauterine PR and 4% ectopic PR in a similar group of patients in the Netherlands. In contrast, we report a 14.3% live birth rate compared with a 33.3% live birth rate reported by the same author. This difference cannot be explained by age alone, because 20 of 42 (47%) women were age 40 years in the present

study compared with 36 of 78 (46%) reported by Trimbos-Kemper (3). Further, our data may overestimate the crude PR because 10 patients were lost to follow-up.

The subjects of our study are largely parous women with no documented history of infertility. Ideally, our study group should be compared with parous women \geq age 40 years who have undergone IVF-ET for tubal factor infertility based solely on prior tubal sterilization. Unfortunately, this IVF-ET data have not been published but may represent a subset of women whose reproductive potential exceeds the current IVF live birth rate of 7.2% per retrieval in women \geq age 40 years without male factor (2).

To our knowledge, there has been only one prior publication that describes the reproductive outcome in the select group of women \geq age 40 years at the time of tubal reversal. Our results clearly support the microsurgical tubal anastomosis operation as an

alternative to IVF-ET in women 40 years of age. Between the ages of 41 and 43 prospective patients must be counseled that the potential for a live birth is small. Microsurgical tubal anastomosis should not be performed in women >43 years or with elevated FSH levels on the basis of our data. Further assembly of IVF-ET data specifically looking at the reproductive outcome of women whose sole cause of infertility is tubal sterilization would provide the best opportunity to most appropriately counsel patients.

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