

# Salpingectomy for hydrosalpinx prior to in vitro fertilization

Practice Committee of the American Society for Reproductive Medicine in collaboration with The Society of Reproductive Surgeons

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Salpingectomy for hydrosalpinges before in vitro fertilization increases the success rate. (Fertil Steril® 2008;90:S66–8. ©2008 by American Society for Reproductive Medicine.)

In vitro fertilization (IVF) generally is accepted as the treatment of choice for women with distal tubal occlusive disease who wish to conceive; the role of tubal reconstructive surgery is quite limited. Whereas surgery still may be considered for selected young women (<age 35 years) with mild tubal disease and no other coexisting infertility factors and for those who reject or have no practical access to IVF, the outcomes achieved with surgery otherwise are almost uniformly poor (1). Evidence indicates that the presence of hydrosalpinges adversely affects results achieved with IVF, decreasing live birth rates by approximately 50% (2, 3). Whether these adverse effects are common to all hydrosalpinges or may be limited to those that are larger and thus visible with transvaginal ultrasonography remains uncertain (4). Treatment of hydrosalpinges by salpingectomy or by proximal tubal occlusion improves results achieved with subsequent IVF. The purpose of this document is to review these data and the pathophysiologic mechanisms that may explain the observations.

## **PATHOPHYSIOLOGY**

A number of mechanisms have been proposed to explain the adverse effects of hydrosalpinges on the live birth rate achieved with IVF. These include a direct embryotoxic effect (5), a decrease in endometrial receptivity, and the possibility that tubal fluid may mechanically flush the embryo from the uterus.

## **IMPACT OF HYDOSALPINX ON IVF SUCCESS**

Several early reports indicated that the presence of unilateral or bilateral hydrosalpinges adversely affects implantation and pregnancy rates achieved with IVF. Outcomes have been summarized in two meta-analyses. The first included over 6700 treatment cycles from 11 studies, four of which were published only as abstracts. The pregnancy rate observed among women with hydrosalpinges (165 pregnancies/1004 cycles; 16.4%) was 49% lower than that observed in women with tubal factor infertility without hydrosalpinges (1478 pregnancies/4736 cycles; 31.2%) (odds ratio [OR] 50.7; 95% confi-

dence interval [CI], 41.4–62.2) (2). The effect was observed in both fresh and frozen embryo transfer cycles. The likelihood of miscarriage also was 2.3-fold (95% CI, 1.6–3.5) higher among women with hydrosalpinges. The likelihood of ectopic pregnancy could not be evaluated precisely even in this data set, suggesting a small, if any, effect on ectopic rates. A second meta-analysis included nine published studies and five abstracts involving 5592 women, including many of the same studies used in the first meta-analysis (3). Delivery rates per cycle start were 13.4% in 1418 cycles with hydrosalpinx and 23.4% in 6735 cycles without hydrosalpinx (OR 0.58; 95% CI, 0.49–0.69).

## **EFFECTS OF TREATMENT**

The effect of interrupting proximal tubal patency or salpingectomy on the outcomes achieved with subsequent IVF has been assessed in three randomized controlled trials (RCTs). One was a pilot study that included 60 patients with hydrosalpinges or proximal tubal disease related to salpingitis isthmica nodosa (6) who underwent laparoscopy; 30 women were treated by salpingectomy, and, in the remaining 30, the tubes were left intact. Unfortunately, the results for patients with proximal occlusion do not address the primary question and reduce the power of the already small study. The pregnancy rates per cycle were 23.7% (14 of 59) after salpingectomy and 16.3% (8 of 49) without salpingectomy; the ongoing pregnancy rates per embryo transfer were 34.2% (13 of 38) after salpingectomy and 18.7% (6 of 32) without salpingectomy.

In a trial involving 204 patients with hydrosalpinges, the delivery rates were 28.6% in the 116 patients randomized to salpingectomy before IVF and 16.3% in the 88 who did not receive preliminary surgical treatment ( $P=.045$ ) (7). In a subgroup analysis limited to patients having hydrosalpinges that were visible with ultrasonography, the corresponding delivery rates with and without preliminary salpingectomy were 40.0% and 17.5%, respectively ( $P=.038$ ).

A third RCT involving 115 patients compared the results observed after laparoscopic salpingectomy or proximal tubal occlusion with those in control women who received no surgical treatment (8). The ongoing pregnancy rates after the first embryo transfer were 37.8% with 45 transfers after

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salpingectomy, 48.9% with 47 transfers after proximal tubal occlusion, and 7.1% after 14 transfers in control patients. Both procedures produced statistically significantly better results than no surgical intervention, and the outcomes achieved with the two surgical treatments were not materially different ( $P=.20$ ) (8). Whether proximal tubal occlusion may induce expansion of hydrosalpinges that may require later and more extensive surgical treatment is unknown.

Based on results from the three trials, the ongoing pregnancy rate after laparoscopic salpingectomy or tubal occlusion (34%) is twofold higher than in controls (17%) (Fig. 1). The 17% rate difference implies that for every six (95% CI, 3–9) women with hydrosalpinges, one more ongoing pregnancy will be achieved if salpingectomy or tubal occlusion is performed before IVF.

## OTHER OPTIONS

Options other than salpingectomy or proximal tubal occlusion have not been adequately evaluated in RCTs. Transvaginal aspiration of the hydrosalpinges during oocyte retrieval was unsuccessful in one study (9) and possibly helpful in another (10). Another RCT observed that clinical pregnancy rates were 31.3% (10 of 32) after aspiration and 17.6% (6 of 34) without (RR = 1.8; 95% CI, 0.8–4.3;  $P=.2$ ) (11). Two reports have described three women with hydrosalpinges who conceived via IVF after hysteroscopic placement of the Essure<sup>®</sup> (Conceptus, Mountain View, CA) microinsert device (12, 13). A small case series found that bilateral placement of the Essure<sup>®</sup> device could be accomplished only in two of five patients with hydrosalpinges; neither of the two women who subsequently underwent IVF conceived (14). There is also the possibility that the portion of the device

residing within the uterine cavity may exert a contraceptive effect similar to that of an intrauterine device. A small observational study found that eight of 17 patients (47%) with hydrosalpinges who were treated with doxycycline for 1 week before and after oocyte retrieval achieved a live birth, compared with 11 of 25 (44%) patients with proximal tubal occlusion or pelvic adhesions and 12 of 22 (55%) women with endometriosis or unexplained infertility who received no such treatment (15). At least in theory, neosalpingostomy may effectively negate the adverse effect of hydrosalpinges on IVF outcomes while also permitting the possibility of natural conception, but no clinical studies have examined the question.

## SUMMARY AND CONCLUSIONS

1. The live birth rate achieved with IVF among women with hydrosalpinges is approximately one half that observed in women without hydrosalpinges.
2. In women with hydrosalpinges, preliminary laparoscopic salpingectomy or proximal tubal occlusion improves subsequent pregnancy and live birth rates achieved with IVF. For every six women with hydrosalpinges, one more ongoing pregnancy will be achieved if salpingectomy or tubal occlusion is performed before IVF.
3. Data are insufficient to permit recommendations regarding the effectiveness of alternative treatments such as laparoscopic neosalpingostomy, transvaginal aspiration of hydrosalpingeal fluid, hysteroscopic tubal occlusion, or antibiotic treatment.

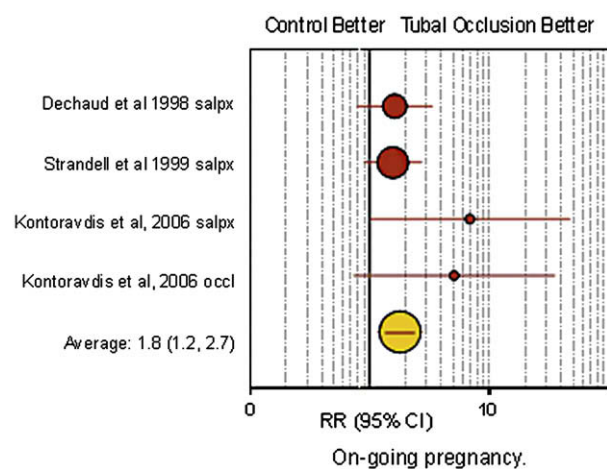
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**FIGURE 1**

Effect of treating hydrosalpinges before in vitro fertilization.



Total patients: 379. ITT analysis

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