

Tubal Reversal versus IVF: Which is the best choice?

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Sterilization is the most common contraceptive method utilized by couples in the United States. Approximately 27% of fertile women choose tubal sterilization as their method of contraception. About half of these surgeries are performed within 48 hours post-partum and the other half as interval procedures remote from a pregnancy. The procedures are meant to be permanent and most women enter into the decision with a sincere intention to prevent additional pregnancies.

But life is full of surprises. Circumstances change, relationships change and family-building goals may change accordingly. Despite having consented to permanent sterilization, up to 14.3% of sterilized women request information regarding fertility options within 14 years of the procedure. What are the options couples who desire pregnancy following tubal sterilization?

The answer to that question is as varied as the couples asking it. Many factors may influence the decision-making process. Generally speaking, the categorical options are either surgery to reverse the sterilization (tubal reversal) or *in vitro* fertilization (IVF). Which process is the least expensive? Which is the easiest and least risky? Which is the best choice based on female age? Most importantly, which is the most likely to result in a successful conception?

Tubal Reversal

In most instances the technique is an outpatient or "short-stay" procedure using a small abdominal incision and micro-surgical techniques to restore the connection between the interrupted tubal segments. As with any surgery, there are risks involved including infection, poor tissue healing, further damage to the fallopian tubes, uterus or ovaries as well as other surrounding tissues, and anesthetic complications. Furthermore, one must consider the post-operative recovery period and time off from work, usually relatively minimal but possibly prolonged. Each patient must determine these risks with her surgeon based on her individual circumstance. Keep in mind that the tubes will always be somewhat damaged following any type of surgery and the risk of ectopic (tubal) pregnancy is ever present. If a reversal is successful there is also the need to again consider post-partum contraception options.

Not all types of tubal sterilizations are reversible. If the remaining fallopian tube segments are not healthy due to previous damage or the segments are extremely short, successful reversal is not feasible. Some types of tubal sterilizations are not technically reversible such as distal fimbriectomy and trans-cervically placed proximal coils (Essure). Others, such as the Irving and Uchida techniques or those in which very large tubal segments were damaged or removed, may be technically reversible but the observed post-operative pregnancy rates are so dismally low that most surgeons do not recommend attempting it. Therefore, it is extremely important to know what sort of sterilization procedure was performed when considering surgery. Patients should obtain a copy of their sterilization operative note and pathology report (if tubal segments were removed) for review with their surgeon. A semen analysis for the male partner should always be done prior to surgery; if the findings are significantly abnormal, tubal reversal is extremely unlikely to result in a successful conception. Ruling out a significant male factor avoids unnecessary and costly surgery with its attendant risks.

The cost of tubal reversal is widely variable depending on the surgeon, hospital and region. Insurance policies very rarely cover the procedure. In some areas, the cost of tubal reversal exceeds IVF which then directly affects the procedure's availability. In other areas, surgeons performing tubal reversals have set up high-volume outpatient surgery clinics which allow costs to be kept to a relative minimum. Keep in mind that the experience of the surgeon is critical to the likelihood of success. Microsurgery requires extensive further training beyond a general OB-GYN or surgery residency; look for a surgeon with such training and experience.

IVF

In vitro fertilization has become the dominant technique for achieving pregnancy in women with abnormal or blocked fallopian tubes. Since its introduction in the late 1970's, the technique has been refined, success rates have improved dramatically and its use is now applied to many additional fertility problems such as severe male factor and unexplained infertility. In essence, the technique involves intentionally hyper-stimulating the ovaries, obtaining the oocytes via needle-aspiration, combining them with the sperm in the laboratory and selection among resultant embryos for transfer back to the uterus. The events which ordinarily occur in the fallopian tubes thus occur in the laboratory, providing a sort of "tubal bypass". IVF allows selection of the healthiest embryos for transfer and often a choice among several embryos. It is less invasive than surgery and associated post-procedure down-time is minimal. Its greatest risks are ovarian hyperstimulation syndrome (occurring in 1-5% of patients) and multiple gestations.

As with any medical process it is extremely important to choose an IVF clinic with care. The outcomes for each clinic vary widely based upon the patient population attending the clinic as well as the experience and techniques employed by the IVF physicians and embryologists. Costs vary widely by region and clinic. Likewise, insurance coverage is notoriously variable and fluctuates widely depending on the individual policies, employers and insurance companies.

Success Rates

Live birth rates following microsurgical tubal reversal have been reported to range between 55-81% in several reported series. These rates are most strongly influenced by the age of the patient at the time of the reversal. Among women younger than 35 years of age with no other significant cause of infertility, a cumulative pregnancy rate of approximately 70% within 18 months of surgery was reported in one review. If viewed from a cost-per-cycle perspective, tubal reversal is relatively efficient. When viewed from a success-per-cycle perspective, however, the rates following tubal reversal are rather low: less than 5% in most series. This implies that many cycles are often necessary to eventually achieve a success. An additional problem rests with the interval of time from surgery to conception: with each year of failed conception following surgery the chance that a pregnancy will be ectopic, should it ever occur, becomes very high.

The problem thus lies with the impact of advancing age on the likelihood of successful conception. As many couples considering pregnancy following tubal reversal are doing so in the context of a new marriage or relationship after completing their first families, the woman is often at an age where fertility is naturally and significantly diminishing. As age continues to advance, the likelihood of success-per-cycle diminishes to ever lower levels. If pregnancy does not occur in a timely manner following tubal reversal the only other option is to consider IVF. A dilemma arises if tubal reversal fails as the woman has aged even further,

diminishing her chances of success with IVF, and the costs of the procedures are thus combined if the couple must resort to both.

IVF success rates are also profoundly affected by the age of the female. In the United States, overall live births rates generally range widely between 20 and 35% per cycle. Most reputable IVF centers report success-per-cycle rates for women under 35 of at least 35-40% and are often higher. Rates for women over age 35 are somewhat less and drop precipitously by age 40-42 and beyond. Most IVF pregnancies are singletons but the rates of multiple gestations are much higher than those seen in spontaneous conceptions: approximately 30% of all pregnancies occurring via IVF are multiples, the majority being twins. If viewed from a cost-per-cycle perspective, IVF may be relatively expensive. When viewed from a success-per-cycle perspective, however, the IVF success rates are much higher than those for tubal reversal.

Which is the best choice: IVF or tubal reversal?

Obviously the decision between IVF and tubal reversal is difficult. In addition to costs and success rates, one should also consider long range plans. How many more children are desired? If multiple children are desired and the woman is young, tubal reversal is perhaps a better choice. If only one more child is desired and the woman is older than 35 years of age, perhaps IVF is the best choice. Beyond age 42-43, the likelihood of success with either tubal reversal or IVF is extremely low and approximately equal: less than 1-3% in most reports. In this case, tubal reversal often becomes the more cost-effective option. In a retrospective Belgian study published in 2007, the difference in pregnancy rates between IVF and tubal reversal were statistically insignificant until they were examined by age of the woman. It became clear that cumulative pregnancy rates for women under 37 were significantly better for tubal reversal; for women over age 37 the rates were better for IVF. However, for all age groups in all published reports the success-per-cycle rates in IVF are better than those for tubal reversal.

The decision between IVF and tubal reversal is highly complex and profoundly affected by the factors of age, cost and time as well as the presence of other potential infertility problems. Each couple facing this decision must be assessed and counseled individually to ensure selection of the treatment option best suited to them.