

Reconstructive tubal microsurgery and assisted reproductive technology

For the infertile woman with tubal damage, there are only two realistic options for achieving a pregnancy: reconstructive surgery or in vitro fertilization (IVF). Until the 1980s, reconstructive surgery was the only therapeutic option for infertility caused by tubal and peritoneal factors. Traditional techniques yielded poor outcomes, often as a result of extensive postoperative adhesions. This led to the development of gynecologic microsurgery in the early 1970s. In addition to the use of magnification, microsurgery introduced a broad concept of surgery designed to be more precise, to minimize trauma and tissue damage, and to avoid an acute inflammatory reaction in the peritoneal cavity to obtain better results and prevent postoperative adhesions.

The use of magnification, and especially the use of microsurgical tenets, not only yielded significantly improved outcomes, but also permitted the successful performance of more complex procedures, such as tubocornual anastomosis for pathologic cornual occlusion. Microsurgical tenets were applied also to surgery performed with laparoscopic access, which provides magnification by approximating the tip of the laparoscope to the site of interest. In addition to permitting the condition to be treated during the initial diagnostic procedure, laparoscopy offered the patient other advantages, now well recognized: less postoperative discomfort and analgesic requirement, shorter hospital stay and period of convalescence, reduced costs, and better cosmetic results. It did not take long to realize that laparoscopic surgery yielded results that were not dissimilar to those obtained via laparotomy—provided the techniques used were the same.

Experience with operative laparoscopy resulted in the modification of open interventions for more complex cases, such as tubocornual anastomosis; the formal laparotomy approach was replaced by a small minilaparotomy incision, permitting such procedures to be performed on an ambulatory basis. Despite this surgical evolution, the scene for reconstructive tubal surgery started to change once success rates with IVF reached more credible levels in the early 1990s, and facilities providing assisted reproductive technology (ART) services became commercialized and readily available. IVF was increasingly offered as the primary treatment option in most cases of tubal-factor infertility, resulting in a significant decline in the use and teaching of reconstructive microsurgery. In the United States (USA), the rate of births per initiated cycle of IVF reached 12.3% in 1990 and progressed to 25.4% in 1999. This rate seems to have reached a plateau around 28%–30% since 2002 (1).

ASSISTED REPRODUCTION

Assisted reproduction has dramatically changed the treatment of infertility for the better. It has offered couples the opportunity to attempt conception with the use of a new therapeutic modality, and, through development of intracytoplasmic sperm injection, with an effective way to overcome most types of male infertility. ART has also triggered the development of preimplantation genetic diagnosis. In

addition, it has permitted streamlining of the investigation of couples presenting with infertility.

Despite the significant improvement in IVF results, the cumulative probability of a live birth after three cycles of treatment is ~54% (at current rates of birth per initiated cycle in the USA). In addition, several studies have shown conclusively that a large proportion of couples do not complete three cycles of IVF, even when they are subsidized, as in several countries in Europe. Some infertile couples refuse to undergo IVF owing to religious or ethical reasons. Others may find the cost to be prohibitive when the procedure is not covered by insurance or the state. IVF is not covered by the provincial medical insurance plan in most Canadian provinces, whereas surgery is. Insurance or state coverage varies widely between countries, and even in different jurisdictions within the same country. This is an important factor that may influence the choice of treatment.

ART has been associated with a worrisome increase in multiple pregnancies and associated preterm births, with the important sequelae of perinatal mortality and morbidity, including cerebral palsy. The perinatal mortality in babies born after ART is almost double that of control subjects. In 2012 in the USA, the rates of preterm births for singleton pregnancies, singletons from multiple fetuses, twins, and triplets and higher-order multiple pregnancies were 11.1%, 17.4%, 57.8%, and 95.3%, respectively. The rates of low-birth-weight infants were similar for each category: 8.6%, 15.6%, 56.1%, and 92.3%, respectively (1).

In the USA in 2012, the 99,665 ART cycles begun with the use of fresh nondonor eggs or embryos resulted in 35,840 pregnancies, of which 26.4% were twins, 2% were triplets and higher-order multiples, and 6.5% were unable to be determined; of the resulting 29,307 live-birth deliveries, 26.4% were twins, and 1% were triplets and higher-order multiples. The live birth rate was 29.4% (1). This rate is significantly higher than rates reported from Europe. The high rate of multiple pregnancies is due to the number of embryos transferred. Because transferring more embryos improves the overall pregnancy rate, there is a temptation to do so. In many European jurisdictions the number of embryos to be transferred is limited by legislation; therefore, both the live birth and the multiple pregnancy rates are significantly lower. Live birth rates vary from 17% to 27%. The incidence of twins varies from 11.1% to 26.6%, and that of triplets and higher-order multiples varies from 0.4% to 3.9% (2).

The large proportion of multiple births, with the associated increase in obstetrical complications, neonatal complications, and deaths, causes great societal costs and significant financial burden and emotional costs for parents.

RECONSTRUCTIVE TUBAL MICROSURGERY

The goal of fertility-promoting surgery is to restore the anatomic and functional integrity of the reproductive organs. Restoration of anatomic integrity does not equate with restoration of functional integrity, because the latter depends on the extent of tubal, ovarian, and other damage that existed before surgery. We have known for a long time that one of the important factors influencing surgical outcome is the

degree of prior damage; this led to the development of various classifications. Proper selection of cases is a critical factor, affecting outcome. The presence of a credible alternative in the form of ART permits the reproductive surgeon of today to operate on cases with a better prognosis, which was not the case in the past. Operating on patients with better prognosis and with the use of a proper microsurgical technique translates into superior outcomes.

Distal Tubal Disease

Distal tubal disease is usually due to pelvic inflammatory disease but may also be caused by peritonitis. As a result, the fallopian tube and/or ovary may be covered by adhesions, the fimbriae may become agglutinated (phimosi), or the distal end of the fallopian tube may be totally occluded (hydrosalpinx); these are processes that preclude oocyte transport into and through the tube. These conditions are amenable to treatment by laparoscopy, with the use of a microsurgical approach, as part of a confirmatory diagnostic procedure.

If other fertility parameters are normal, and periadnexal adhesions are the sole lesion, laparoscopic division of shallow adhesions and excision of broad ones (salpingo-ovariolysis) will restore normal anatomy. This procedure yields cumulative intrauterine pregnancy rates from 50% to >60%; this author reported one or more live births in 54 (59%) of 92 patients after surgery (3).

Fimbrial phimosi necessitates a fimbrioplasty; this condition often coexists with periadnexal adhesions, which must be dealt with first. The reported cumulative intrauterine pregnancy rates after laparoscopic fimbrioplasty range from 40% to 50%; in a series of 40 such cases, reported by this author, 19 women (48%) had live births (3).

Periadnexal adhesions are also often present with hydrosalpinges; a preliminary salpingo-ovariolysis would be followed by salpingostomy (salpingoneostomy). Liberal use of laparoscopic salpingostomy will yield live birth rates of 20%–30%. With favorable (mild) cases, these rates are significantly higher. In a series of 90 women whose surgery was performed by this author, 19 (21%) were lost to follow-up, 27 had one or more intrauterine pregnancies, and 23 had one or more live births. This represents a live birth rate of 32.4% among the patients followed, and a rate of 25.6% if we include all lost to follow-up as failures. Based on the American Fertility Society classification, 73 of these cases had severe tubal damage and 13 (17.8%) of these had live births, whereas in the 17 whose damage was classified as mild, 10 (58.8%) had one or more births (3, 4).

With all of these conditions, the outcome depends on the prior degree of damage to the ciliary mucosa of the fallopian tubes, the degree of scarring of the myosalpinx, and the surgical technique used. This clearly demonstrates the importance of the preliminary investigation of the patient and assessment of the tubes.

The deleterious effect of large hydrosalpinges (visible at sonography) on IVF results has been well established. Significant improvement in outcomes is achieved by salpingectomy or proximal tubal occlusion before IVF, and both of these

require laparoscopy. It has been demonstrated that prior salpingostomy, instead, provides an equally beneficial effect with IVF, and it offers the woman the potential of achieving a pregnancy naturally (4). The American Society for Reproductive Medicine's (ASRM's) most recent committee opinion (5) in this regard reads as follows: "Although IVF is preferred over salpingostomy for mild hydrosalpinges in older women and for those with male factor or other infertility factors, salpingostomy before IVF may improve the subsequent likelihood of success of IVF while still giving the patient the option to attempt spontaneous conception. ... Patients with poor-prognosis hydrosalpinges are better served by salpingectomy followed by IVF" (5).

Tubal Anastomosis

Tubal anastomosis may be undertaken to overcome an occlusion located anywhere along the tube. Most occlusions are caused by a disease process; rarely they are congenital or due to remains of an old tubal pregnancy. The other common indication is reversal of previous tubal sterilization.

Tubal Anastomosis for Reversal of Sterilization

Microsurgery finds its ultimate application in tubotubal anastomosis. The precision afforded by the microsurgical technique, and the healthy status of the available tubal segments, leads to an anatomically and physiologically normal, albeit shortened, fallopian tube after surgery.

Women who are ≤ 35 years of age with normal ovarian function and a fertile male partner can anticipate a cumulative live birth rate of $\sim 70\%$ – 75% , with most pregnancies occurring within 12 months after surgery. Those > 35 years old can anticipate a cumulative live birth rate of 50%. The birth rate in those > 40 years old is not negligible. In a multicenter survey carried out in the Netherlands in 1990, the birth rate among 78 women aged ≥ 40 years after a minimum period of 1 year of follow-up was 44%. Recent publications support that evidence.

The procedure can be performed with laparoscopic access as well as robotic assistance. With both of these there is a great variation in reported results, as is the case for access by minilaparotomy with the use of an operating microscope. The principal factors that affect the outcome are: the age of the woman, which plays a paramount role in fertility regardless of the mode of treatment; the length of the available tubal segments; the degree of excellence of the microsurgical technique; and the selection of patients. Therefore, the outcome depends on the degree of rigor in the microsurgical technique and in patient selection criteria. With a precise microsurgical technique, the tubal pregnancy rate is low, $\sim 2\%$ (3, 4).

A relatively recent study analyzed the delivery rates of two groups with similar characteristics: One of the groups underwent IVF ($n = 79$) and the other surgical reversal of sterilization ($n = 84$). The cumulative delivery rate over 72 months in the IVF and reversal groups were 52% and 59.5%, respectively. In those < 37 years of age, they were 52.4% and 72.2%,

Download English Version:

<https://daneshyari.com/en/article/3935362>

Download Persian Version:

<https://daneshyari.com/article/3935362>

[Daneshyari.com](https://daneshyari.com)