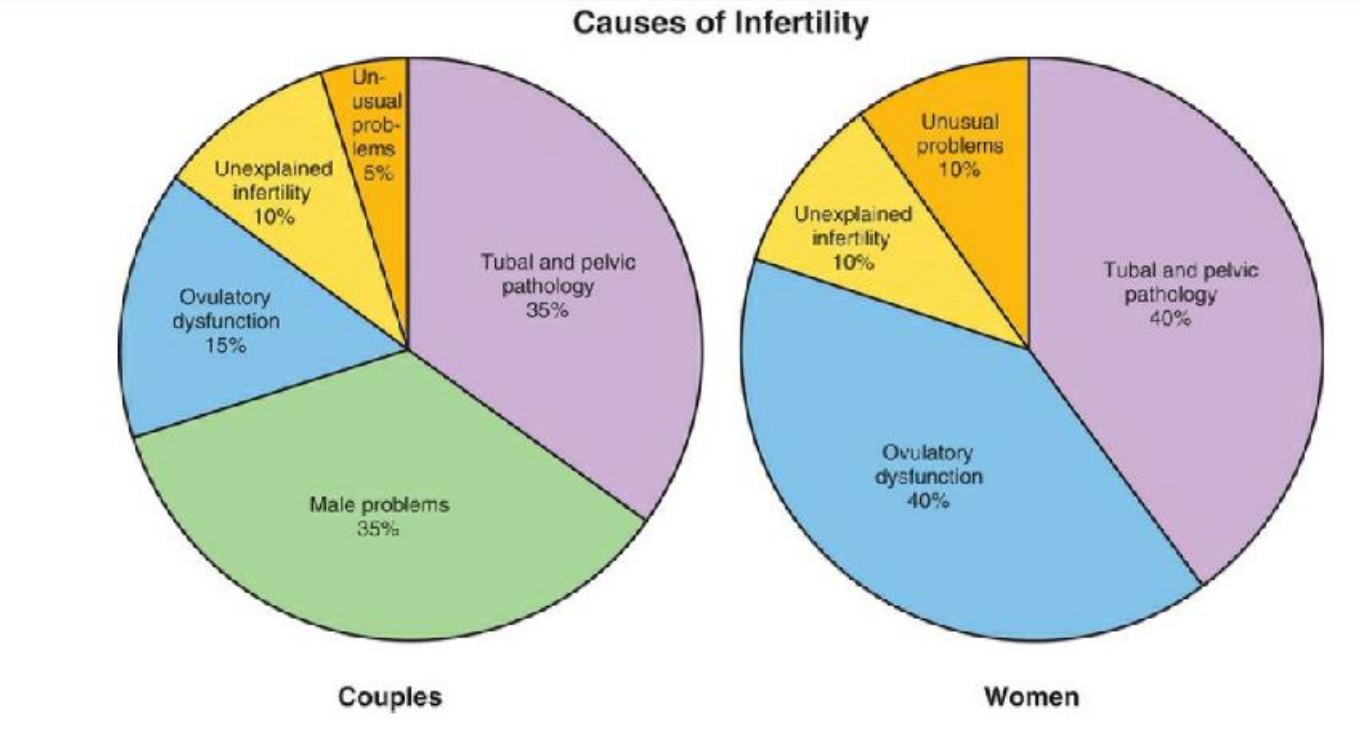
TUBAL INFERTILITY


Causes of Infertility
Un-
usual
prob-
lems
5%
Unexplained
infertility
10%
Ovulatory
dysfunction
15%
Tubal and pelvic
pathology
35%
Male problems
35%
Couples
Unusual
problems
10%
Unexplained
infertility
10%
Tubal and pelvic
pathology
40%
Ovulatory
dysfunction
40%
Women

Tubal and peritoneal pathology is among the most common causes of infertility and tubal pathology accounts for 25–35% of female infertility.

A history of pelvic inflammatory disease (PID), septic abortion, ruptured appendix, tubal surgery, or ectopic pregnancy strongly suggests the possibility of tubal damage.

Unquestionably,

PID is the major cause of tubal factor infertility and ectopic pregnancies. Classic studies in women with PID diagnosed by laparoscopy revealed that the risk of subsequent tubal infertility increases with the number and severity of pelvic infections; overall, the incidence is approximately 10–12% after one episode, 23–35% after two, and 54–75% after three episodes of acute PID.

- The primary cause of tubal factor infertility is pelvic inflammatory disease caused by pathogens such as chlamydial or gonorrhea.
- Other conditions that may interfere with tubal transport include severe endometriosis, adhesions from previous surgery or nontubal infection (eg, appendicitis, inflammatory bowel disease),
- Pelvic tuberculosis, and salpingitis isthmica nodosa (ie, diverticulosis of the fallopian tube). Proximal tubal blockage may result from plugs of mucus and amorphous debris or spasm of the uterotubal ostium, but does not reflect true anatomic occlusion.

TUBAL INFERTILITY

- Proximai tubal dx
- Distal tubal dx
- Bipolar dx

DIAGNOSTIC TESTS

- A test to rule out tubal occlusion and assess the uterine cavity. We usually perform a **hysterosalpingogram (HSG),** or ***hysterosalpingo-contrast sonography (HyCoSy),*** which evaluates both the uterus and tubes, but **laparoscopy with chromotubation combined with hysteroscopy** may be more appropriate in women suspected of having endometriosis. Dilute methylene blue can be used for the chromotubation dye.

HYSTEROSALPINGO-CONTRAST SONOGRAPHY

Hysterosalpingo-contrast sonography (HyCoSy) ***uses ultrasound*** to view the uterus, tubes, and adnexa before and after transcervical injection of echogenic contrast media (either microbubble contrast or agitated saline). It is ***a safe, well tolerated, quick and easy method*** for obtaining information on tubal status, the uterine cavity, the ovaries, and the myometrium using conventional ultrasound. In a 2014 systematic review of studies that compared ***HyCoSy with HSG for diagnosis of tubal occlusion in subfertile women, both tests had high diagnostic accuracy compared with laparoscopy*** (reference standard), ***with no significant difference between them***. For HyCoSy, sensitivity was 0.92 (95% CI 0.82-0.96) and specificity was 0.95 (95% CI 0.90-0.97) per tube for diagnosing tubal occlusion. Tubal spasm and tubal fistula, as well as operator error could account for misdiagnoses. In our experience, ***patients tolerate HyCoSy better than HSG***, and it is increasingly utilized as an alternative method to image the uterus and determine tubal patency if available.

ROLE OF LAPAROSCOPY

The role of laparoscopy in the evaluation of infertility is controversial. Laparoscopy is invasive and expensive. Findings at laparoscopy usually do not alter the initial treatment of the infertile couple when the initial infertility evaluation is normal or when it shows severe male factor infertility. However, as endometriosis may be present in up to 50 percent of women who present with a complaint of infertility, the clinician must decide when women who present for the evaluation of infertility undergo surgical exploration for endometriosis and other pathology as part of their workup.

- Laparoscopy may be indicated in women in whom endometriosis or pelvic adhesions/tubal disease is suspected based on physical examination, HSG, or history (eg, current dysmenorrhea, pelvic pain, or deep dyspareunia; previous complicated appendicitis, pelvic infection, pelvic surgery, or ectopic pregnancy). When we perform laparoscopy, we also perform chromotubation to assess tubal patency and hysteroscopy to evaluate the uterine cavity. For this reason, if laparoscopy is planned, then HSG can be omitted

Treatment of tubal infertility

SURGERY OR IVF

- Age
- Ovarian reserve
- Prior infertility status
- Number of children desired
- Site and extent of tubal damage
- Presence or absence of other factor necessitating ivf
- Surgens experience
- Success rate of ivf
- Pt preference religious belif cost

IN VITRO FERTILIZATION

IVF is a proven method of treatment of tubal factor infertility and has the following advantages and disadvantages compared with tubal reconstruction.

Advantages :

- Better per-cycle success rate than other fertility treatments
- Less surgically invasive than tubal surgery
- Can overcome other subfertility factors, if present (eg, male factor, cervical factor, decreased ovarian reserve)
- Site and extent of tubal damage are not important to outcome

Disadvantages:

- High per cycle cost and possible need for multiple cycles
- Need for IVF each time a pregnancy is desired
- Requires frequent injections and monitoring
- Increases risk of multiple gestation
- Increases risk of ovarian hyperstimulation syndrome
- Possibly slightly higher absolute risk of some adverse perinatal outcome than natural conception

- For patients with access to in vitro fertilization (IVF) services, IVF is first-line treatment for tubal factor infertility due to bilateral tubal obstruction.
- For women who cannot access or decline IVF, we offer surgical reconstruction to young patients with bilateral distal or proximal tubal obstruction.
- Counseling is provided regarding the success rates of different methods of repair compared with those using the assisted reproductive technologies and on the high risk of ectopic pregnancy. If surgery is successful, this approach has the advantages that additional treatment is not required for each attempt at conception, and it allows natural conception.

- **For women with severe tubal disease (bilateral hydrosalpinx, both proximal and distal occlusion, extensive adhesions) and for older women, we recommend IVF as the initial approach because tubal surgery is unlikely to be successful in these patients.**
- **It is important to make a definitive diagnosis of bilateral proximal tubal occlusion, as HSG may yield false positive results. This is in contrast to distal tubal occlusion, where findings from HSG and laparoscopic tubal lavage typically are concordant.**

TREATMENT OF PROXIMAL TUBAL OCCLUSION

- The incidence of true cornual occlusion is low and surgical treatment (ie, resection and anastomosis) is not highly successful.
- Diagnosis — Hysterosalpingographic findings suggestive of cornual or proximal tubal occlusion must be interpreted with caution as sensitivity and specificity are only 65 and 83 percent, respectively . In addition, we reported that repeat hysterosalpingogram in 98 women with hysterosalpingographic findings of bilateral proximal tubal occlusion revealed bilateral tubal patency in 14 women and patency of one of the tubes in 12 others; true occlusion was encountered in 72 patients (74 percent)

- **If the fallopian tubes are not visualized on hysterosalpingogram, a repeat procedure should be done to exclude the possibility of a random technical problem or tubal spasm. If the test remains abnormal, then selective tubal catheterization under fluoroscopic or hysteroscopic control is indicated to confirm the diagnosis and potentially open the tube**

- **Tubocornual anastomosis — Tubocornual anastomosis can be performed in women with true cornual obstruction. The cornual portion of the tube is resected followed by anastomosis . Depending upon the extent and severity of tubal damage, intrauterine pregnancy rates range from 16 to 55 percent and ectopic pregnancy rates are 7 to 30 percent . Since this procedure is traditionally performed by laparotomy, rather than laparoscopically, and the intrauterine pregnancy rate is relatively low, IVF is often a better alternative. Tubocornual anastomosis can be performed by laparoscopy; however, the number of reported cases is small**

PROXIMAL TUBAL OCCLUSION

- Reconstructive surgery for bilateral proximal tubal occlusion is not very effective, and the risk of subsequent ectopic pregnancy is high (as high as 20 percent)
- Therefore, IVF is preferable, if available. When IVF is not available or not acceptable, proximal tubal occlusion may be treated with hysteroscopic or fluoroscopic tubal catheterization or with tubocornual anastomosis by laparotomy (a laparoscopic approach is possible but requires significant expertise). An advantage of the minimally invasive hysteroscopic approach over fluoroscopy-directed selective salpingography is the capability to perform concomitant laparoscopy with tubal lavage, allowing the clinician both to confirm the diagnosis of proximal occlusion and to treat any coexisting tubal adhesions prior to performing hysteroscopic cannulation

UNILATERAL PROXIMAL TUBAL OCCLUSION

Unilateral proximal tubal occlusion can be treated medically initially with controlled ovarian hyperstimulation. A retrospective case-controlled study found that controlled ovarian hyperstimulation with intrauterine insemination (IUI) in women with unilateral proximal tubal occlusion resulted in pregnancy rates statistically similar to those in patients with unexplained infertility (31 versus 43 percent), while patients with unilateral mid-distal or distal tubal occlusion had significantly lower pregnancy rates (19 versus 43 percent)

Distal tubal obstraction

TREATMENT OF DISTAL TUBAL OCCLUSION

- Distal tubal obstruction is usually a sequela of salpingitis. Other causes are previous ectopic pregnancy, previous abdominal or pelvic surgery, and peritonitis.
- Diagnosis — Distal tubal occlusion is usually diagnosed by hysterosalpingogram that shows dilated distal tube (hydrosalpinx). The diagnosis is established at the time of laparoscopy; chromopertubation leads to dilated distal tube with no passage of the dye.

DISTAL OBSTRUCTION

- Surgery for the treatment of tubal factor infertility is most successful in women with distal tubal obstruction. Fimbrioplasty, the lysis of fimbrial adhesions or dilatation of fimbrial strictures, and neosalpingostomy, the creation of a new tubal opening in a distally occluded tube, may be performed via laparotomy or laparoscopy.

- **Fimbrioplasty — Fimbrioplasty is performed for treatment of fimbrial phimosis, which is a partial obstruction of the distal end of the fallopian tube. The tube is patent, but there are adhesive bands that surround the terminal end. The longitudinal folds of the tube are usually preserved. Fimbrioplasty involves dividing the peritoneal adhesive bands that surround the fimbria. Gentle introduction of an alligator laparoscopic forceps into the tubal ostium followed by opening and withdrawal of the forceps helps to stretch the tube and release minor degrees of fimbrial agglutination**
- **In a series including 434 patients with distal tubal occlusion who underwent laparoscopic fimbrioplasty (enlargement of the ostium) or neosalpingostomy (creation of a new ostium) by a single surgeon, five-year actuarial delivery rates decreased as the severity of tubal occlusion increased: 53, 43, 24, and 23 percent, respectively; the ectopic rate was stable at about 15 percent. These results are inferior to those of IVF (29 percent of IVF cycles result in a live birth and 0.7 percent result in ectopic pregnancy). The authors concluded that fimbrioplasty/neosalpingostomy was an appropriate alternative to IVF for women with less severe tubal occlusion (stage 1 or 2), but IVF was the better option for women with more severe disease (stage 3 or 4). Time is also a consideration: half of the pregnancies occurred in the first 11 months after surgery and 75 percent occurred in the first 21 months.**

HYDROSALPINX

- After PID resolves, the damaged fallopian tube can become blocked, fill with sterile fluid, and become enlarged. Damage to the fallopian tube from previous surgery or adhesions can also result in hydrosalpinx.
- Hydrosalpinx may be associated with pain or may be asymptomatic except for tubal factor infertility.
- Hydrosalpinx in patients undergoing in vitro fertilization (IVF) has negative consequences on the rates of pregnancy, implantation, early pregnancy loss, preterm birth, and live delivery

SALPINGECTOMY BEFORE IN VITRO FERTILIZATION

- Several reports have described a detrimental effect of hydrosalpinx on implantation and pregnancy rates. The leakage of hydrosalpingeal fluid from the tube into the uterine cavity may impede implantation either by flushing the embryos out of the cavity or disrupting the endometrium at the implantation site. Furthermore, hydrosalpinx fluid contains microorganisms, debris, toxins, cytokines, and prostaglandins that may impair endometrial receptivity and possibly reduce the percentage of motile spermatozoa

On a molecular level, one group demonstrated decreased endometrial HOXA10 expression in response to hydrosalpinx fluid, with restoration of HOXA10 expression after salpingectomy . Since HOXA10 is an important transcription factor for implantation of the embryo, impaired expression of this gene may be a mechanism for the deleterious effect of hydrosalpinges on implantation during IVF.

INTERVENTIONS AGAINST HYDROSALPINX IN CONJUNCTION WITH IVF

- **According to the theory that the hydrosalpingeal fluid plays a causative role in impairing implantation and/or embryo development, any surgical intervention interrupting the communication to the uterus would remove the leakage of the hydrosalpingeal fluid and restore pregnancy rates.**

- presence of **bilateral** as opposed to **unilateral** hydrosalpinx was associated with significantly lower pregnancy (12% vs. 24%) and implantation rates (5% vs. 11%)

- **Pregnancy rates were significantly lower (15%) in patients with visible hydrosalpinges compared with patients in whom the hydrosalpinges were not visible.**

- **Treatment with salpingectomy prior to IVF is the only surgical method that has been evaluated in a sufficiently large randomized controlled trial (RCT), supplying us with a high level of evidence to formulate our recommendation.**

Salpingectomy

- **Salpingectomy is the only method of prophylactic surgery in patients with hydrosalpinx**

- A multicenter study in Scandinavia **compared laparoscopic salpingectomy to no intervention** prior to the first IVF cycle.

- **significant improvement in pregnancy and birth rates after salpingectomy in patients with hydrosalpinges that were large enough to be visible on ultrasound**

- **Benefit of salpingectomy is only evident if the tube is fluid filled.**

- **Cochrane review**, suggests that all patients with hydrosalpinx, regardless of size or fluid accumulation, should undergo salpingectomy.

HOWEVER

- **Scandinavian study** revealed that the benefit of salpingectomy mainly affected patients with hydrosalpinges visible on ultrasound.

Other suggested treatments for hydrosalpinx prior to IVF:

- ✓ Tubal ligation
- ✓ Transvaginal aspiration

Transvaginal aspiration

- **Since laparoscopic salpingectomy has been shown to be an effective pre-IVF method to improve pregnancy rates, the search for less invasive methods has continued**

There is a **rapid reoccurrence** of fluid that is already noticeable at the time of transfer in many cases, which most likely compromises any beneficial effect of drainage

- **It has been clearly shown that aspiration before ovarian stimulation has started is not effective, possibly due to high recurrence rate.**

- To overcome the problem of the high recurrence rate after transvaginal aspiration of hydrosalpinx fluid, ethanol **sclerotherapy** has been introduced

- **mechanism of ethanol is to coagulate the endothelial cells lining the hydrosalpinx to harden the salpingeal wall and reduce secretion.**

Tubal occlusion by laparoscopy

- **Surgical treatment requiring laparoscopy also includes proximal ligation and salpingostomy**

- There was no significant difference in clinical pregnancy rate when salpingectomy was compared with proximal tubal occlusion

Salpingostomy

- Salpingostomy is naturally the method of choice if the tube is suitable for reconstructive surgery.

- **Terminal salpingostomy — Terminal salpingostomy is performed to relieve tubal obstruction associated with hydrosalpinx. Efficacy for improving fertility is generally poor, but depends upon tubal wall thickness, ampullary dilation, presence of mucosal folds, percentage of ciliated cells in the fimbrial end, and peritubal adhesions. The average pregnancy rate following salpingostomy is nearly 30 percent, with an ectopic pregnancy rate of 10 percent . However, the pregnancy rate can be as low as zero if the tube is rigid and thick without rugae, and as high as 80 percent when tubal damage is absent or minimal by hysterosalpingogram, salpingoscopy, or inspection at surgery**

Tubal occlusion by hysteroscopy

- Tubal occlusion through hysteroscopy has been suggested when laparoscopy is contraindicated, like in cases with severe obesity or frozen pelvis.

use of the microinsert sterilization device (Essure)

TUBAL REANASTOMOSIS

- Indications for tubal anastomosis include reversal of sterilization, midtubal block secondary to pathology, tubal occlusion from ectopic pregnancy, and salpingitis isthmica nodosa. The goal is to remove abnormal tissue and reapproximate the healthy tubal segments with as little adhesion formation as possible. The technique involves microsuturing using 6-0 to 10-0 sutures.
- Sterilization reversal, although not always successful, is the most successful surgical reconstructive procedure for improving fertility. Factors that may influence the success rate of tubal reanastomosis include the age of the patient, time from sterilization, and sterilization technique.

- In one large series, pregnancy rates after sterilization reversal among women aged 15 to 30 years, 30 to 33 years, and 34 to 49 years were 73, 64, and 46 percent, respectively . Most pregnancies occurred within two years after reversal. Of interest, 23 percent of patients subsequently underwent another sterilization. In another series, tubal anastomosis resulted in live births in 41 percent of women with a previous electrocautery procedure, 50 percent of those who had a Pomeroy tubal ligation, 75 percent of women with rings, and 84 percent of those with clips

TUBAL REVERSAL

- Age before 37
- Final tubal length more than 4 cm
- Larascopy or laparotomy same result
- Most of preg in first 24m month after sx
- Rate of EP is equal


THANK
YOU