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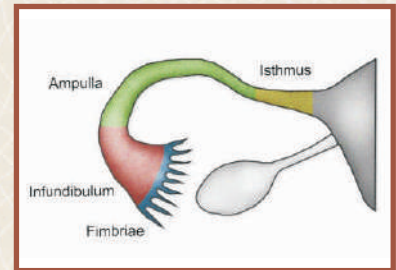
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TUBAL FACTORS IN INFERTILITY

Tubal factors are responsible for 11-30% percent of infertility in general population. 25-35% of female factor infertility is due to tubal disease. Fallopian tube damage can be intrinsic (salpingitis) or extrinsic (pelvic surgery, peritonitis endometriosis) take several forms:

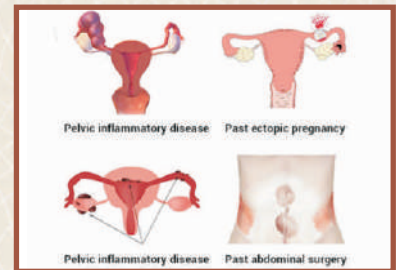
1. Proximal occlusion: Obliterative fibrosis, salpingitis isthmica nodosa, tubal polyps, cornual fibroids
2. Midsegment occlusion: Segmental salpingectomy for sterilization or for ectopic pregnancy, congenital segmental absence
3. Distal tubal occlusion
 - Nonocclusive, preserved fimbria: Fimbrial agglutination, mild prefimbrial phimosis, perifimbrial adhesions
 - Occlusive, absent fimbria: Hydrosalpinx, post-distal salpingectomy for sterilization or ectopic pregnancy



CAUSES :

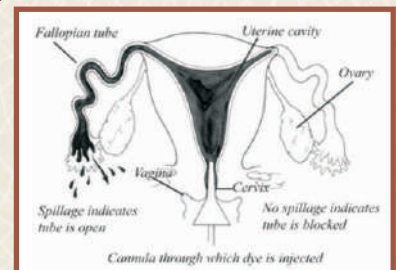
Mostly Acquired

1. PID (chlamydia trachomatis, gonorrhea, multibacterial)
2. Tuberculosis
3. Endometriosis related adhesions or direct involvement
4. Peritonitis due to any other cause
5. Previous surgery such as tubal ligation, ectopic pregnancy, tubo-ovarian masses
6. Cornual polyp
7. Intrauterine synechieae



EVALUATION OF TUBES :

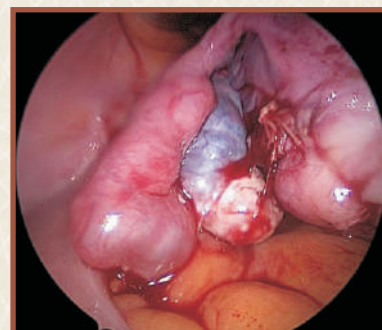
1. History and examination normal , Trans vaginal scan normal and no other associated male factor then tubal patency can be postponed for 3 to 6 months. Timed intercourse and basic ovulation induction can be planned without HSG/SSG.
2. First line basic tubal patency test is hysterosalpingography (HSG). Saline-Sonohysterosalpingography (SSG) is an effective alternative wherever available. Hysterosalpingo contrast sonography (HyCoSy) has the same efficacy as HSG.
3. Chlamydia antibody titre testing (CAT) – is cheap, less invasive option over tubal patency test and can be performed any time in cycle. A negative test rules out tubal disease.



4. Laparoscopy is the procedure of choice when comorbidities or associated pathologies like PID, history of ectopic pregnancy, endometriosis adnexal masses are present.
5. Ultrasonography: Normal tubes are not visualized on ultrasound. All sonologically detectable hydrosalpinges are significant. Best method to evaluate Hydrosalpinx is 2D TVS.
6. Tuberculosis testing such as Bactec, PCR, AFB staining
7. PID diagnosis according to CDC guidelines.

MANAGEMENT :

1. **Reconstructive Surgery :** In the hands of skilled reproductive surgeon and depending upon site and extent of tubal damage impressive pregnancy rates are possible. Tubal repair under magnification (operating microscope, loupes), accurate apposition of anatomic layers, fine sutures (6-0 to 10-0), gentle handling of tissues, and good hemostasis, and more recently with robotic surgery tubal repair shows promising future.



Proximal tubal disease: Surgical options are a laparotomy with macrosurgical tubal reimplantation or microsurgical tubocornual anastomosis, transcervical tubal catheterization under fluoroscopic control or hysteroscopic visualization. There is approximately 9% risk of ectopic and 2 % risk of tubal perforation.

Distal tubal occlusion disease or hydrosalpinx: Neosalpingostomy is an option with improved results with use of CO₂ or yttrium aluminium garnet laser for couples keen for natural conception. But high risk of ectopic pregnancy, upto 70% risk of recurrence of hydrosalpinx and poor pregnancy rates need to be counseled.

Outcome of patients requiring sterilisation reversal (mostly responsible for midsegment tubal occlusion) is dependant on the technique used for sterilization. Laparoscopic sterilization with clipping or ring has the best prognosis with as much as 50% chance of conception after successful surgery. Tubal reanastomosis on laparotomy with microsurgical repair or robotics assisted laparoscopy show best results.

Non occlusion disease: Laparoscopic fimbrioplasty and fimbriolysis

2. Destructive surgery followed by IVF. In severely damaged tubes with visible hydrosalpinx women older than 35 years destructive surgery like laparoscopic salpingectomy or laparoscopic or transcervical tubal occlusion has improved pregnancy rates and Live Birth Rates with IVF.
3. Direct IVF: In the absence of hydrosalpinges and when other contributing factors are seen to impair fertility direct IVF should be considered.

CONCLUSION :

Reconstructive tubal surgeries have the chance of restoring natural fertility of couples and reduce the financial and psychological burden of failed IVF. But Monthly fecundity rates and cumulative pregnancy rates after 3 IVF cycles (35% and 72%) far outnumber natural fecundity after successful tubal surgery (7 to 15% and 25 to 50% respectively) . Therefore in the era of ART, with modest success rates of tubal surgery and increased risk of ectopic pregnancy merits judicious selection of cases. The risk of decreasing ovarian reserve, losing precious fertile years and delaying time to pregnancy especially in the presence of other coexisting factors all options should be weighed and considered properly when selecting ART or reconstructive tubal surgery.