CONGENITAL TUBAL OBSTRUCTION

Congenital Fallopian Tube Obstruction, Congenital Tubal Occlusion

Fallopian tube(s) blocked from birth unabling to let the ovum and the sperm converge, thus making fertilization impossible.

ℹ️ Diagnosis ⚪ Female

About Congenital tubal obstruction

Congenital tubal obstruction is a rare cause of blocked fallopian tubes, present from birth. The occluded tube (or tubes) is unable to let the ovum and the sperm converge, thus making fertilization impossible. If only one Fallopian tube is obstructed, only a subfertility condition results, with the other tube allowing for sperm to converge with an egg. If both Fallopian tubes are blocked, female infertility results if untreated.

Congenital tubal obstruction may result from defective development of Müllerian duct – the embryonic basis for the fallopian tube, uterus and a portion of vagina (Pic. 1). If only one Müllerian duct fails to develop normally, obstruction or absence of only one Fallopian tube results. Complete failure of the Müllerian system development leads to the absence of both Fallopian tubes, often together with absence of the uterus, cervix and most of the vagina. Such complete maldevelopment of the female reproductive tract is called Rokitansky-Küster-Hauser syndrome.

Obstruction of Fallopian tubes linked with Müllerian system maldevelopment is often associated with other congenital defects, commonly affecting the kidneys and the urinary tract. Isolated Fallopian tube malformations, including atresia (obstruction), are rare conditions. They may be caused by any disruption to the process of development, differentiation and maturation of the embryonic structures that eventually give rise to Fallopian tubes. In addition, exposure of an embryo to diethylstilbestrol, a formerly used oral contraceptive which is now considered teratogenic (harmful to embryo development), can cause under-developed and abnormally narrow fallopian tubes.

Congenital tubal obstruction may be completely asymptomatic for a long time. In women with only one blocked fallopian tube, the condition may go completely unnoticed. In cases of both fallopian tubes being obstructed, infertility may be the only symptom. The condition may sometimes present with lower abdominal pain if the patient develops hydrosalpinx (Pic. 2). A hydrosalpinx is a distally blocked fallopian tube filled with clear fluid. The blocked tube may become substantially distended giving the tube a characteristic sausage-like or retort-like shape. The condition is often bilateral and the affected tubes may reach several centimeters in diameter.

The diagnosis of tubal obstruction is possible through a specific X-ray regimen, called a hysterosalpingogram (Pic. 3), when radiopaque fluid (a solution that appears bright on an X-ray image) is injected into the uterine cavity and subsequently fills the fallopian tubes. A hysterosalpingogram will demonstrate that tubes are open when the radiopaque dye spills into the abdominal cavity. Sonography can demonstrate tubal abnormalities such as a hydrosalpinx indicative of tubal occlusion. During surgery, typically laparoscopy, the status of the tubes can be inspected and a dye such as methylene blue can be injected in a process termed chromotubation into the uterus and shown to pass through the tubes when the cervix is occluded. Laparoscopic chromotubation has been described as the gold standard of tubal evaluation.

Fallopian tube obstruction has traditionally been treated with fallopian tubal surgery (tuboplasty) with a goal of restoring patency to the tubes and thus possibly normal function. A common modern day method of treatment is in vitro fertilization as it is more cost-effective, less invasive, and results are immediate. Treatments such as assisted reproductive technologies are used more often than surgery.
Associated diseases

- Müllerian system abnormalities
- Rokitansky–Küster–Hauser syndrome
- fallopian tube aplasia (absent fallopian tube)
- hydrosalpinx
- ectopic pregnancy

Complications

Hydrosalpinx

A distally blocked fallopian tube filled with serous (yellowish or transparent fluid, consisting of water and proteins) or clear fluid. The blocked tube may become substantially distended giving the tube a characteristic sausage-like or retort-like shape. The condition is often bilateral and the affected tubes may reach several centimeters in diameter. The blocked tubes cause infertility.

Ectopic pregnancy

Women with abnormal fallopian tubes are at greater risk of developing ectopic pregnancy.

Infertility

When both fallopian tubes are blocked, the sperm cannot reach the egg and therefore, conception and pregnancy is impossible.

Risk factors

- diethylstilbestrol exposition in utero (during embryonic development in the uterus)
- Mülllerian duct maldevelopment

Impact on fertility

Unhindered passage of both egg and sperm through the fallopian tube is crucial for conception and subsequent pregnancy. The effect of tubal blockage on fertility depends on whether it affects one or both the tubes. If only one fallopian tube is affected, only a condition of lower fertility results, with a preserved possibility of a pregnancy because of the remaining functional fallopian tube. If both the tubes are blocked or aplastic (absent), complete female infertility results and if the condition cannot be cured surgically, the only option for the patient to get pregnant is using the assisted reproduction technology (ART).

Prevention

Because this condition is present from birth, possible prevention is very limited. Avoiding exposure to teratogenic agents, e.g. diethylstilbestrol, during pregnancy, lowers the risk of disrupting organ development and of potential congenital anomalies.

Symptoms

- few or none
- infertility
- lower abdominal pain
- menstrual pain

Therapies

Self therapy
For fallopian tube obstruction, alternative medicine has been used as a form of fertility treatment. A number of various approaches is available. A popular method is herbal treatment. Many herbs are believed to have effect on the health of Fallopian tubes - these include goldenseal root, ginger root, hawthorn, peony root or wild yam root. Another popular method is the traditional Chinese medicine recipe called Fuyan pill. Also, a number of massage techniques are used to open the obstructed fallopian tubes. For example, the Self Fertility massage can be applied by the patients themselves. Other massage techniques include Clear Passages therapy or Mercier therapy. Another option is the Castor oil therapy, which utilizes pieces of cloth soaked in castor oil and applied externally. They promote healing of the fallopian tubes by increasing circulation and softening the surrounding tissues. Additionally, the Systemic enzyme therapy is also used to promote healing and remove the obstruction of the fallopian tubes.

### Conventional medicine

Treatment of fallopian tube obstruction has traditionally been treated with fallopian tubal surgery (tuboplasty) with a goal of restoring patency to the tubes and thus possibly normal function. A common modern day method of treatment is in vitro fertilization as it is more cost-effective, less invasive, and results are immediate. Treatments such as assisted reproductive technologies are used more often than surgery. Pharmacotherapy is of limited use in the treatment of congenital tubal obstruction.

### Pharmacotherapy

Pharmacotherapy is generally not used to treat congenital tubal obstruction, as by the time of the diagnosis, there is usually no process that can be pharmacologically averted. Treatment with antibiotics can, however, be used in women with the risk of developing tubal obstruction due to Pelvic inflammatory disorder.

### Surgical therapy

#### Tuboplasty

Tuboplasty refers to a number of surgical operations that attempt to restore patency and functioning of the fallopian tube(s) so that a pregnancy could be achieved. As tubal infertility is a common cause of infertility, tuboplasties were commonly performed prior to the development of effective in vitro fertilization (IVF).

Different types of tuboplasty have been developed and can be applied by laparoscopy (via small punctures in the abdominal wall) or laparotomy (via an incision in the abdominal wall). They include lysis of adhesions (fibrous tissue inside the fallopian tube, or attaching it to other structures), fimbrioplasty (repairing the fimbriated end of the tubes), salpinostomy (creating an opening for the tube), resection and reanastomosis (removing a piece of blocked tube and reuniting the remaining patent parts of the tube), and tubal reimplantation (reconnecting the tube to the uterus).

Further, proximal tubal occlusion (closer to the uterine opening of the tube) can be overcome by unilateral (on one side) or bilateral (on both sides) selective tubal cannulation, a procedure where a thin catheter is advanced through the proximal portion of the fallopian tube os to examine and possibly restore tubal patency, salpinostomy (creating an opening for the tube) or fallopscopy (inspection of the fallopian tubes through a micro-endoscope).

### Assisted reproduction

Assisted reproduction technology such as in vitro fertilization (IVF) are today used more often than surgical treatment, as it is less invasive and more reliable. In many cases of congenital tubal obstruction, and especially in cases of tubal aplasia, surgical reconstruction of functional fallopian tubes is not feasible. In patients affected with bilateral tubal obstruction (affecting both fallopian tubes) that cannot be treated surgically, assisted reproduction treatment (ART) is the method of choice to restore fertility.

Assisted reproductive technology (ART) is the technology used to achieve pregnancy in procedures such
as fertility medication, artificial insemination, in vitro fertilization and surrogacy. It is reproductive technology used primarily for infertility treatments, and is also known as fertility treatment. It mainly belongs to the field of reproductive endocrinology and infertility, and may also include intracytoplasmic sperm injection (ICSI) and cryopreservation. Some forms of ART are also used with regard to fertile couples for genetic reasons (preimplantation genetic diagnosis). ART is also used for couples who are discordant for certain communicable diseases, for example, HIV to reduce the risk of infection when a pregnancy is desired.

If conservative medical treatments fail to achieve a full term pregnancy, the physician may suggest the patient undergo in vitro fertilization (IVF). IVF and ART generally start with stimulating the ovaries to increase egg production. Most fertility medications are agents that stimulate the development of follicles in the ovary. Examples are gonadotropins and gonadotropin releasing hormone. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman’s reproductive tract, in a procedure called embryo transfer.

Infertile couples may also resort to egg donation or embryo donation when the female partner cannot have genetic children because her own eggs cannot generate a viable pregnancy. Surrogacy via a gestational carrier is also an option when a patient’s medical condition prevents a safe pregnancy, when a patient has ovaries but no uterus due to congenital absence or previous surgical removal, and where a patient has no ovaries and is also unable to carry a pregnancy to full term. The rate of success for IVF is correlated with a woman’s age. More than 40 percent of women under 35 succeed in giving birth following IVF, but the rate drops to a little over 10 percent in women over 40.
The fate of Müllerian duct in male and female embryo. In female, the Müllerian ducts (or Müllerian system) give rise to fallopian tubes, uterus and most of the vagina. In male, the duct regresses and is replaced by structures of the Wolffian duct.

Ultrasound examination showing a hydrosalpinx: the dark (hypoechoic) tubular structure represents the fallopian tube, dilated by the accumulated fluid.

In this hysterosalpingogram, the contrast fluid is seen as black. The contrast fluid is seen spilling into the abdominal cavity on both sides. Therefore, both of the fallopian tubes are unobstructed.

Sources

“Diethylstilbestrol” —sourced from Wikipedia licensed under CC BY-SA 3.0

“Hydrosalpinx” —sourced from Wikipedia licensed under CC BY-SA 3.0

“The Value of Hysterosalpingography following Medical Treatment with Methotrexate for Ectopic Pregnancy” —by Grau et al. licensed under CC BY 3.0

“Comparison of hysterosalpingograms with laparoscopy in the diagnostic of tubal factor of female infertility at the Yaoundé General Hospital, Cameroon” —by Ngowa et al. licensed under CC BY 2.0

“Left Vaginal Obstruction and Complex Left Uterine Horn Communication in a 12 Year Old Female” —by Perlman et al. licensed under CC BY 4.0

“Assisted reproductive technology” —sourced from Fertilitypedia licensed under CC BY 4.0

“Fallopian tube” —sourced from Wikipedia licensed under CC BY-SA 3.0

“Sexual Differentiation-02” —by OpenStax College licensed under CC BY 3.0

“Hydrosalpinx_(left)” —by Ekem licensed under CC BY-SA 3.0