GYNECOLOGIC SURGERY

Surgery on the female reproductive system that could result in infection and thus adhesions impairing fertility.

⚠️ Risk factor ♂ Female

About Gynecologic surgery

Gynecological surgery refers to surgery on the female reproductive system. It includes procedures for benign conditions, cancer, infertility, and incontinence. Most often complications after gynecologic surgery include infection and thus risk of adhesions. For example, myomectomy (surgery to remove fibroids), tubal surgery (to remove ectopic pregnancy), surgery on the ovary (to remove cysts) and surgery for endometriosis can cause adhesions.

There are several types of gynecological surgeries depending on the underlying cause:

- **gynecologic oncology** - offers diagnosis and treatment of women’s cancers (cervical, endometrial, ovarian, vaginal and vulvar cancer)
- **urogynecology and reconstructive pelvic surgery** - evaluates and diagnoses women with pelvic floor conditions (urinary and fecal incontinence, pelvic organ prolapse, vaginal fistulas and congenital uterine and vaginal anomalies such as absence of the vagina or developmental defects of the uterus)
- **minimaly invasive gynecologic surgery** (Pic. 1) - the option for range women with noncancerous gynecologic conditions including heavy menstrual periods (menorrhagia), irregular menstrual periods (metrorrhagia), pelvic pain, recurrent pregnancy loss and ovarian cysts

In general gynecology and reproductive gynecology, the robot is being increasingly used. Initially, traditional laparoscopy afforded less invasive approaches. However, not all surgeons are comfortable with the laparoscopic approach due to its steep and extended learning curve, nor are all patients and procedures amenable to traditional laparoscopy. In fact, the majority of advanced gynecologic surgeries are still being performed through an abdominal incision (laparotomy).

Despite the advantages of laparoscopic procedures, they do not come without risk and complications for the patient. As with laparotomy there is always danger for deep vein thrombosis, inflammation and creation of adhesions. It should be noted though that compared to laparotomy there is a higher risk of injury to the major blood vessels positioned in the pelvis and the urinary system, and that is why patients considered to be subjected to laparoscopy should be carefully chosen.

**Symptoms**

The results of studies about the surgical recovery process show that surgical patients may feel discomforts that could persist for years after the surgery, such as: pain, fatigue, problems with the surgical wound and mobility, among others that affect the resumption and performance of activities that maintain life, health and welfare. However, clinical symptoms are related to underlying indication for gynecologic surgery.

These problems can be related to incorrect/mistaken treatment, kind of surgery, the patient's low capacity of coping with stress and insufficient information provided by health professionals.

**Associated diseases**

Ovarian cysts
An ovarian cyst is a fluid-filled sac that develops on a woman’s ovary. Small ovarian cysts are usually asymptomatic and found incidentally clinically or on ultrasound. They may sometimes cause pain or discomfort. The most frequent complications of benign ovarian cysts are torsion, hemorrhage, and rupture. Large or persistent ovarian cysts, or symptomatic cysts, usually need to be removed by surgery. Also, surgery should be recommended if there are concerns that the cyst could be cancerous or could become cancerous.

Laparoscopy is considered the gold standard approach to manage benign ovarian cysts. The benefits of laparoscopy include reduced postoperative analgesic requirement, earlier mobilization reducing chances of deep venous thrombosis (DVT), cosmetic advantages, earlier discharge from the hospital, and return to normal activity. Huge ovarian cysts are conventionally managed by laparotomy.

The link between ovarian cysts and infertility is still the subject of debates. Moreover, surgical intervention on ovarian cysts may sometimes be more threatening than the cysts themselves, with respect to maintaining adequate ovarian capacity and fertility.

**Ectopic pregnancy**

Ectopic pregnancy (EP) is the result of implantation and maturation of the conceptus outside the endometrial cavity, which ultimately ends in the death of the fetus. Without timely diagnosis and treatment, EP can become a life-threatening situation.

In spite of the various recent advances in the management of ectopic pregnancy, conventional surgical treatment by laparotomy (Pic. 2) is still the most widely used modality of treatment in our institution. With appropriate and prompt management, maternal mortality due to ectopic pregnancy can be prevented, because previous pelvic operation may increase the risk of EP. Previous surgery in the pelvic area or on the tubes can cause adhesions. Adhesions form in the majority of women after gynecologic pelvic surgery.

**Endometrial cancer**

Endometrial cancer is the most common gynaecological cancer affecting women, and with an increasing incidence, a safe, cost effective, and tolerated management is important. The treatment remains removal of the uterus (hysterectomy, Pic. 3) and adnexa (ovaries and fallopian tubes), and this can be accomplished via laparotomy, vaginally, totally laparoscopic, laparoscopically assisted or robotically. The surgery is both diagnostic (staging) and therapeutic (80%) cure.

**Ovarian cancer**

Epithelial ovarian cancer accounts for 80% of all ovarian cancers, is more common in industrialized countries affecting middle and upper classes more commonly. Standard management is surgical staging in apparent early stage disease and adjuvant therapy for high risk early stage patients. Exploratory laparotomy and surgical cytoreduction, also known as debulking (reducing the number of tumor cells), is the mainstay of treatment in advanced stage disease.

**Cervical cancer**

Cervical cancer is a cancer arising from the cervix. It is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body. Early cervical cancers are treated surgically, by radical abdominal hysterectomy and pelvic lymphadenectomy. Mobilizing the ureter makes surgeon’s movements safer. However, the treatment of low-grade lesions may adversely affect subsequent fertility and pregnancy.

**Endometriosis**

Endometriosis is an often painful disorder in which tissue that normally lines the inside of your uterus (endometrium) grows outside the uterus. Endometriosis seems to be responsible for most pathological cases of chronic pelvic pain and also for the highest percentage of cases who are referred with primary and secondary infertility.

While primary infertility is defined as the inability to conceive or carry a pregnancy successfully to full term, secondary infertility is defined as difficulty in conceiving after already having previously conceived (either carrying a pregnancy to term or a miscarriage).
Laparoscopy (Pic. 4) holds a special place in the diagnosis of this problem as it is the gold standard diagnostic test in clinical practice for the accurate diagnosis of endometriosis.

Complications

Infection

The development of surgical site infection remains the most common complication of gynecologic surgical procedures and results in significant patient morbidity. Gynecologic procedures pose a unique challenge in that potential pathogenic microorganisms from the skin or vagina and cervix may migrate to operative sites.

Multiple host and surgical risk factors have been identified as risks that increase infectious sequelae after pelvic surgery. The risk of infection is significantly elevated when there is an increased concentration and virulence of contaminating bacteria.

Adhesions

Adhesions are defined as abnormal attachments between tissues and organs. Factors associated with the formation of post-surgical adhesions include tissue trauma, infection, ischaemia (local deficiency of blood supply), reaction to foreign bodies (sutures, powder from gloves, gauze particles etc.), haemorrhage (bleeding), tissue overheating or desiccation and exposure to irrigation fluids.

The incidence of intra-abdominal adhesions ranges from 67% to 93% after general surgical abdominal operations and from 60% to 90% after gynecological procedures.

Not unexpectedly, adhesion formation is considered one of the most common post-operative complications. Post-surgically, many adhesions may be asymptomatic or can lead to a broad spectrum of clinical problems, including intestinal obstruction, chronic pelvic or abdominal pain and female infertility, requiring re-admission and often additional surgery, while at the same time they can complicate future surgical procedures.

Adhesion-related re-operations are a common consequence of gynecological procedures and adhesiolysis is followed by a high incidence of adhesion reformation and de-novo adhesion formation.

Uterine perforation

Uterine perforation is a condition resulting from the accidental piercing of the full thickness of the uterine wall. Perforation of the uterus is a potential complication of all intrauterine procedures and may be associated with injury to surrounding blood vessels or viscera, such in bladder, bowel. In addition, uterine perforations and associated complications that are not diagnosed at the time of the procedure can result in hemorrhage or sepsis.

Risk factors

- gynecologic cancers
- adhesions
- ovarian cysts
- ectopic pregnancy
- obesity
- surgical site infection
- uterine perforation

Prevention

Evaluation for preoperative and postoperative risk factors and managing modifiable risk factors can decrease infection rates.

After the operation, it is necessary to monitor the symptoms of any complications and to seek medical attention if anything is observed.
How it can affect fertility

Postoperative vaginal cuff cellulitis, pelvic cellulitis and pelvic abscesses are among the most common complications of gynecologic surgeries.

**Vaginal cuff cellulitis** is the infection that involves only the skin and subcutaneous tissue of the incision. The infection involving deep soft tissue (e.g., muscle) is called **pelvic cellulitis**. **Pelvic abscess** involves any part of the anatomy (e.g., organs and spaces) other than the incision. A pelvic abscess is the end stage in the progression of a genital tract infection and is frequently an unnecessary complication. The abscess may fill the pelvis and occasionally the lower abdomen, and is usually posterior (rear) to the uterus.

The association between infection and infertility has been long known. The infections that lead to asymptomatic infections are more damaging as lack of symptoms prevents a patient from seeking timely medical intervention and consequently chronic damage to pelvic organs. Chronic inflammation of the cervix and endometrium, alterations in reproductive tract secretions, induction of immune mediators that interfere with gamete or embryo physiology, and structural disorders such as intrauterine synechiae all contribute to female infertility.

Adhesions are a frequent cause of infertility and pelvic pain in women. Pelvic adhesions impair fertility by disrupting normal tubal-ovarian relationships.

Uterine perforation could pose a risk of uterine rupture during labor and contractions due to the scar tissue in uterine wall. Typically, uterine rupture occurs suddenly and requires immediate critical emergency care for mothers, fetuses, or neonates.

Prognosis

As women postpone motherhood, preservation of fertility is a frequent concern of the gynecological surgeon. Surgical recovery is a complex matter due to its multidimensional nature. The return of patients to their daily activities does not always occur as expected neither has the same quality intended. After a thorough analysis of the patients' reproductive status such as age, duration of infertility and other infertility causes, surgery and a prompt attempt at natural conception with sufficient time (at least six months) is advisable.

Women with a pelvic abscess have the highest (85% to 90%) rate of subsequent infertility. Indeed, timely management of infections goes a long way in preventing damage, disability, chronic pelvic pain, altered tubo-ovarian relationship and consequently helps in maintaining fertility.
Hysteroscopy is the inspection of the uterine cavity by endoscopy with access through the cervix. It allows for the diagnosis of intrauterine pathology and serves as a method for surgical intervention (operative hysteroscopy).

(A) Left tubal ectopic pregnancy at laparoscopy and (B) tubal ectopic pregnancy has been removed by salpingectomy (surgical removal of fallopian tube).

(Hysterectomy is the surgical removal of the uterus. It may also involve removal of the cervix, ovaries, fallopian tubes and other surrounding structures.

Cumulative intrauterine pregnancy rate in the 12 months after laparoscopy in women with endometriosis.

Sources

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