**Clinical Technical Manual**

**Fertility, Rejuvenative, ART, and Obstetric Procedures**

**A. Fertility-Related Laparoscopic Procedures**

**1. Diagnostic Hysterolaparoscopy**

**Overview:**  
Minimally invasive dual procedure combining hysteroscopy and laparoscopy for comprehensive evaluation of uterus, fallopian tubes, and ovaries. Enables both diagnosis and simultaneous therapeutic intervention.

**Indications:**

* Unexplained infertility
* Suspected endometriosis, pelvic adhesions, or uterine abnormalities

**Complications:**

* Hemorrhage, infection, injury to pelvic organs
* Shoulder pain due to insufflation gas

**Procedure (Steps):**

1. General anesthesia administered.
2. Periumbilical incision for laparoscope insertion.
3. Accessory port placed for instruments if required.
4. Chromopertubation performed using cervical dye injection to assess tubal patency.
5. Hysteroscope introduced transvaginally for uterine cavity inspection.

**2. Hysteroscopic Septal Resection**

**Overview:**  
Corrective hysteroscopic procedure for congenital uterine septum, restoring cavity shape to reduce miscarriage risk and enhance fertility.

**Indications:**

* Recurrent pregnancy loss due to uterine septum
* Infertility associated with uterine septum

**Complications:**

* Uterine perforation
* Hemorrhage, infection

**Procedure (Steps):**

1. Performed under general or local anesthesia.
2. Hysteroscope advanced via cervix.
3. Resection of septum with specialized cutting instruments.
4. Post-op management: prophylactic antibiotics, hormonal support.

**3. Laparoscopic Myomectomy**

**Overview:**  
Fibroid excision preserving uterine integrity and fertility. Preferred for women desiring conception.

**Indications:**

* Symptomatic large fibroids causing infertility, pain, or menorrhagia

**Complications:**

* Uterine adhesions/scarring
* Hemorrhage, infection

**Procedure (Steps):**

1. General anesthesia administered.
2. Multiple small abdominal incisions for laparoscope and instruments.
3. Excision of fibroids with careful dissection.
4. Uterine wall reconstructed via laparoscopic suturing.

**4. Laparoscopic Cystectomy**

**Overview:**  
Excision of ovarian cysts with maximal preservation of healthy ovarian tissue.

**Indications:**

* Ovarian cysts causing infertility or pelvic pain

**Complications:**

* Ovarian damage
* Bleeding, infection

**Procedure (Steps):**

1. General anesthesia administered.
2. Laparoscopic entry through abdominal ports.
3. Cyst carefully dissected and removed, preserving normal ovarian tissue.

**5. Laparoscopic Tubal Recanalisation**

**Overview:**  
Restoration of patency in blocked fallopian tubes to enable natural conception.

**Indications:**

* Bilateral tubal block leading to infertility

**Complications:**

* Ectopic pregnancy risk
* Re-scarring of tubes

**Procedure (Steps):**

1. Laparoscope introduced to identify obstruction.
2. Microinstruments employed to clear tubal lumen.

**6. Laparoscopic Tubal Recanulation**

**Overview:**  
Targeted intervention for proximal tubal obstruction using catheter-based approach.

**Indications:**

* Proximal tubal blockages

**Complications:**

* Tubal trauma
* Infection

**Procedure (Steps):**

1. Catheter or cannula inserted laparoscopically.
2. Precision reopening of obstructed segment.

**7. Laparoscopic Salpingectomy**

**Overview:**  
Surgical removal of a diseased or damaged fallopian tube. Enhances IVF outcomes in hydrosalpinx cases.

**Indications:**

* Ectopic pregnancy
* Severe tubal pathology (hydrosalpinx)

**Complications:**

* Hemorrhage, infection
* Injury to adjacent pelvic organs

**Procedure (Steps):**

1. Performed under general anesthesia.
2. Diseased tube identified, dissected, and removed laparoscopically.

**8. Laparoscopic Salpingostomy**

**Overview:**  
Creation of a distal tubal opening to restore fertility in hydrosalpinx or distal obstruction.

**Indications:**

* Mild hydrosalpinx
* Distal tubal occlusion

**Complications:**

* Infection
* Recurrence of obstruction

**Procedure (Steps):**

1. Laparoscopic access to fallopian tube.
2. Distal incision created to establish a functional opening.

**B. Advanced Rejuvenative Therapies**

**1. Sub-Endometrial PRP Therapy**

**Overview:**  
Platelet-rich plasma injection into endometrium to enhance receptivity and endometrial thickness.

**Indications:**

* Thin endometrium
* Repeated implantation failures

**Complications:**

* Rare infection at injection site

**Procedure (Steps):**

1. Autologous blood sample collected and centrifuged for PRP.
2. PRP injected into endometrium under ultrasound guidance.

**2. Ovarian PRP / Rejuvenation**

**Overview:**  
Intra-ovarian PRP injection to activate dormant follicles and enhance ovarian reserve.

**Indications:**

* Diminished ovarian reserve
* Early menopause

**Complications:**

* Minimal risk of infection, transient pelvic pain

**Procedure (Steps):**

1. Autologous PRP prepared.
2. Injection into ovarian cortex under guidance.

**3. Stem Cell Therapy (Experimental)**

**Overview:**  
Application of stem cells for ovarian regeneration in cases of insufficiency. Currently investigational.

**Indications:**

* Ovarian insufficiency
* Damaged ovarian tissue

**Complications:**

* Immunological reaction
* Infection risk

**Procedure (Steps):**

1. Stem cells isolated and prepared in laboratory.
2. Intra-ovarian transplantation performed.

**4. Testicular PRP Therapy**

**Overview:**  
Application of PRP to testes for improving spermatogenesis.

**Indications:**

* Oligospermia
* Asthenospermia

**Complications:**

* Minor injection-site infection or discomfort

**Procedure (Steps):**

1. PRP prepared from patient’s blood.
2. Ultrasound-guided testicular injection.

**C. Assisted Reproductive Technology (ART) Procedures**

**1. Oocyte Retrieval**

**Overview:**  
Transvaginal ultrasound-guided follicular aspiration of mature oocytes, critical to IVF.

**Indications:**

* Oocyte collection in IVF cycles

**Complications:**

* Ovarian hyperstimulation
* Minor bleeding

**Procedure (Steps):**

1. Sedation or anesthesia administered.
2. Needle-guided aspiration of follicles.

**2. TESA / PESA**

**Overview:**  
Minimally invasive retrieval of sperm in azoospermia cases.

**Indications:**

* Obstructive and non-obstructive azoospermia

**Complications:**

* Bruising, transient pain, infection

**Procedure (Steps):**

* **TESA:** Needle aspiration of testicular tissue.
* **PESA:** Needle aspiration of sperm from epididymis.

**3. Micro TESE**

**Overview:**  
Microsurgical dissection of testicular tissue to locate viable sperm in severe male infertility.

**Indications:**

* Severe non-obstructive azoospermia

**Complications:**

* Pain, scarring, infection

**Procedure (Steps):**

1. Performed under anesthesia.
2. High-power microscopy guides selective tissue extraction.

**4. Embryo Transfer**

**Overview:**  
Placement of embryos into uterine cavity to achieve implantation.

**Indications:**

* Final step of IVF cycle

**Complications:**

* Rare uterine cramping, spotting

**Procedure (Steps):**

1. Embryos loaded into catheter.
2. Ultrasound-guided intrauterine deposition.

**5. Embryo Freezing**

**Overview:**  
Cryopreservation of surplus embryos for future cycles.

**Indications:**

* Fertility preservation
* Future pregnancy planning

**Complications:**

* Rare freezing/thawing failure

**Procedure (Steps):**

1. Embryos vitrified using cryopreservation.
2. Storage in liquid nitrogen tanks.

**6. Semen Freezing**

**Overview:**  
Cryopreservation of sperm for fertility preservation.

**Indications:**

* Pre-chemotherapy, radiotherapy
* Planned delayed parenthood

**Complications:**

* Minimal risk of sample degradation

**Procedure (Steps):**

1. Ejaculated semen collected and processed.
2. Cryostorage in liquid nitrogen.

**7. Oocyte Freezing**

**Overview:**  
Elective fertility preservation through vitrification of unfertilized oocytes.

**Indications:**

* Women delaying childbearing
* Pre-oncological treatment preservation

**Complications:**

* Ovarian hyperstimulation during collection

**Procedure (Steps):**

1. Oocyte retrieval performed.
2. Cryopreservation by vitrification.

**D. Obstetric Surgical Interventions**

**1. Lower Segment Caesarean Section (LSCS)**

**Overview:**  
Surgical delivery of fetus via lower abdominal and uterine incision.

**Indications:**

* Fetal distress
* Cephalopelvic disproportion
* Failed labor progression

**Complications:**

* Hemorrhage, infection
* Prolonged recovery

**Procedure (Steps):**

1. Regional or general anesthesia.
2. Low transverse abdominal and uterine incision.
3. Delivery of fetus and placenta.

**2. Cervical Cerclage**

**Overview:**  
Cervical reinforcement with suture to prevent mid-trimester pregnancy loss due to incompetence.

**Indications:**

* History of cervical insufficiency
* Short cervix on ultrasound
* Recurrent 2nd trimester losses

**Complications:**

* Infection, bleeding
* Preterm rupture of membranes
* Preterm labor

**Procedure (Steps):**

1. Preoperative evaluation with USG.
2. Regional/general anesthesia.
3. Placement of suture at internal os (McDonald or Shirodkar technique).
4. Post-procedure monitoring for contractions, infection.
5. Elective removal at 36–37 weeks or earlier if labor ensues.