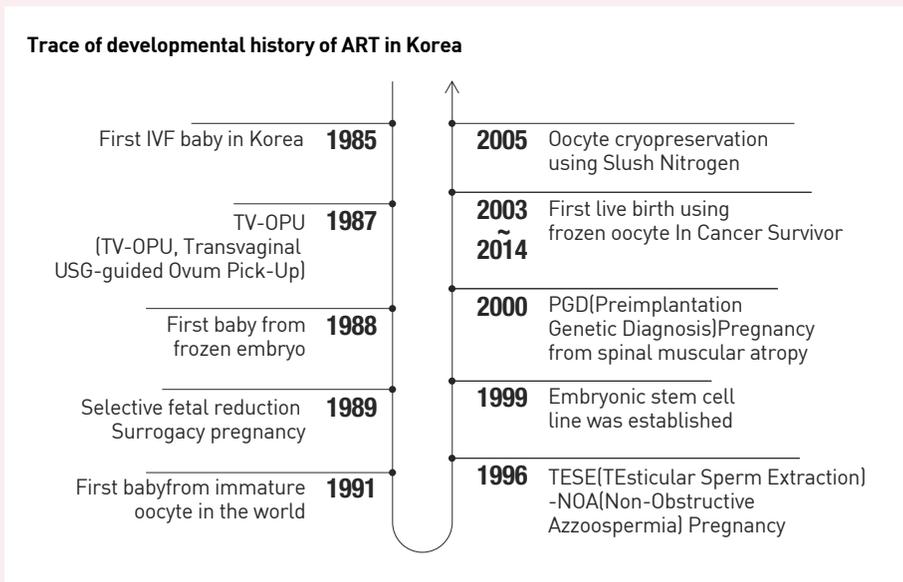


The history of Assisted Reproductive Technology(ART) development in Korea

In Korea, the first IVF(In Vitro Fertilization) baby was reported in 1985 by Prof. Chang Yoon Seok at Seoul National University Hospital, then, Korea was recorded as the 10th country succeeded in live birth from IVF in the world.



Why Korea?

1. With the introduction of the latest technology and creative research, IVF technology is excellent and pregnancy rate is high.
2. The success rate of pregnancy is high through intensive treatment especially in patients with repeated IVF failure and the advanced maternal age.
3. Highly qualified medical services: delicate care, transparent IVF cost
4. Provide donation and surrogate programs
5. Closely connection with medical staffs before and after the procedure
6. Environment is convenient and pleasant - sightseeing the city sightseeing

Advanced treatments of ART in Korea

01 In Vitro Maturation using immature oocyte-In Vitro Fertilization(IVM-IVF)

IVM refers to aspiration and in vitro maturation of immature oocytes from small antral follicles at the stage prior to selection and dominance. In this infertility treatment, immature oocytes are retrieved from the unstimulated or minimally stimulated ovaries and matured in a maturation medium supplemented with follicular fluid and gonadotropins.

Patients can benefit from IVM procedure reducing the risk of OHSS(ovarian hyperstimulation syndrome), avoiding potential side effects of COH(Controlled Ovarian Hyperstimulation) using gonadotropic releasing hormone and gonadotropins and reducing the cost for COH.

02 Cryopreservation & Fertility Preservation

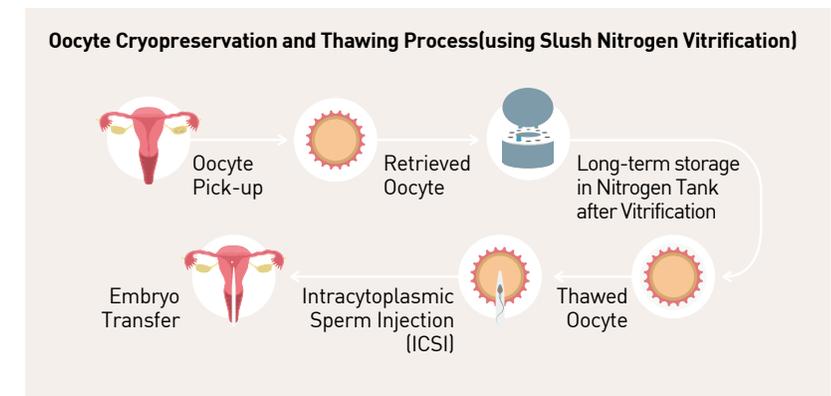
Korea has been the pioneer in the field of reproductive medicine using cryopreservation techniques such as vitrification for over 20 years introducing cutting-edge technology year after year and bringing hope and new life into the homes of countless families.

Embryo cryopreservation

- 1) For infertility patients
- 2) For cancer patients

Embryo freezing before cancer treatments for a married woman diagnosed with cancer

Social Oocyte Banking (freezing) for single women



03 Blastocyst Transfer

There are two possibilities for embryo transfer in IVF: either a ① cleavage-state embryo or ② a blastocyst embryo can be transferred.

* Advantages of Blastocyst Transfer

1. Synchronization
2. Embryo Selection
3. for PGD(Preimplantation Genetic Diagnosis) / PGS(Preimplantation Genetic Screening)
4. Higher implantation rates



04

Preimplantation Genetic Diagnosis/ Preimplantation Genetic Screening What is PGD?

Pre-implantation genetic diagnosis (PGD) refers to the genetic test on cells removed from embryos (embryos prior to implantation, and sometimes even of oocytes prior to fertilization), to help select the best embryo(s) for pregnancy or to be free of a genetic disease. PGD thus is an adjunct to assisted reproductive technology, and requires in vitro fertilization (IVF) to obtain oocytes or embryos for evaluation. PGD is an option not to transmission of genetic diseases or recurrent miscarriages in a similar fashion to prenatal diagnosis.

Preimplantation genetic screening (PGS); Aneuploidy Screening

Aneuploidy screening reduces the chance that a transferred embryo has a chromosome abnormality. The most common chromosome abnormalities in miscarriages include: trisomy (three copies of a chromosome) or monosomy (one copy of a chromosome) for chromosomes 13, 15, 16, 18, 21, or 22; triploidy (three copies of all the chromosomes); and abnormalities of the sex chromosomes.

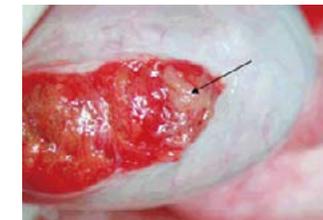
05 Time lapse embryo monitoring system Time-lapse Embryo Incubator

The principle of this device is that the embryo is not exposed to the outside of the incubator until the day of embryo transfer, but the image of all embryos is visualized and then the best embryo is selected using a special program.

* Proven clinical benefits of Time-lapse Embryo Incubator

- Reduced pregnancy loss
- Improved implantation rate
- Shorter time to pregnancy

06 Treatment of Male Infertility



Microsurgical TESE (Testicular Sperm Extraction) is an effective sperm retrieval from men with NOA (Non-Obstructive Azoospermia) for ICSI. The procedure is performed through a very small incision in the midline of the scrotum. Surgeon opens the testicles through this incision

and look under a high power, operating microscope (at 20-25X magnification) for seminiferous tubules that are swollen and contain sperm. The advantages of this technique are minimally invasive technique, removal of minimal amount of testicular tissue and minimizing negative impact on testicular function.

Figure. Microsurgical TESE. arrow exposed pink thickened seminiferous tubules, isolated regions of spermatogenesis within the testis [Kim et al., Korean J Urol. 2008]



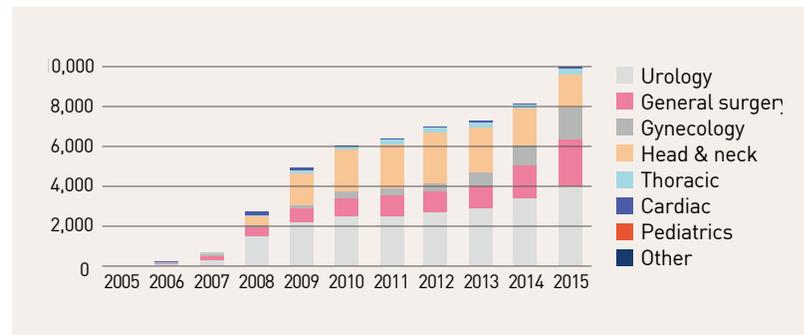
07 Reproductive Surgery

Single port assisted laparoscopic surgery

Classical laparoscopy is a method of performing 3 to 4 incisions per 1 cm in the umbilicus and lower abdomen. In a single port assisted laparoscopic surgery, about 2 centimeter single incision is made in the umbilicus. Since the incision is localized to the umbilicus, it not only has a high cosmetic satisfaction but is also effective in reducing postoperative pain.

Robotic surgery

This surgical approach combines the advantages of laparoscopy, but overcome the limitation with the full range of motion that may not have been accomplished with traditional laparoscopy. There are many centers that has Robotic surgery systems and skillful surgeons in Korea.



08 Treatment of Recurrent Miscarriage & Repeated IVF Failures

Definition

- Recurrent pregnancy loss : occurrence of two or more consecutive losses of clinically recognized pregnancies prior to the 20th week of gestation
- Repeated implantation failure : over two to three times of IVF failure in spite of good embryo transfer

Patient-specific treatment by etiology

- Lifestyle modification and medical consultation
- Laparoscopic or hysteroscopic surgery : more conservative
- PGD/PGS
- Treatment for Thrombophilia
- Immunologic treatment (Immunoglobulin G - IVIG)

How to proceed IVF-ET in Korea?

Top-quality medical staffs and updated embryo culture system and embryology skill will be the key to IVF success. And well educated international coordinator should be in place to connect the patient with medical staffs on-line and off-line.



Pre-arrival Consultation

History taking, provision of medical records to review and advice to prepare during preconception period for enhancing fertility will be carried out before ART treatment.



Pre-arrival Preparation

Wife and spouse are recommended to prepare the mandatory official documents that proves their marital status



Post-arrival Process

Pretreatment testing will include blood work to determine hormone levels, blood tests required by Korean law (Act on Bioethics and Safety), a semen analysis (if applicable), and a uterine assessment. In order to have the optimal IVF outcome, physicians review patient's medical history and the results of pretreatment testing before physicians decide on an individualized IVF protocol.



Four Steps of IVF-ET

- (1) Controlled Ovarian Stimulation (COS)
- (2) Transvaginal USG-guided Ovum Pick-Up (TV-OPU)
- (3) In Vitro Fertilization (IVF) & Embryo Culture
- (4) Embryo Transfer (ET)

| IVF-ET Procedures | Duration | |
|---|------------|-----------------------|
| Controlled Ovarian Stimulation (COS) | 8~14 days | Injection days |
| Transvaginal USG-guided Ovum Pick-Up (TV-OPU) | 10~20 min. | Sedation |
| In Vitro Fertilization (IVF) & Embryo Culture | 3~6 mins | Calls from Laboratory |
| Embryo Transfer (ET) | 5~10 mins | No sedation |
| Pregnancy test (9~11 days after ET) | 5 mins | Check serum hCG level |

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