

Infertility

Its Causes and Advances in Treatment

Professor Dr. Taher Abdel Rahim Shaheen

Collected English Review Edition

English pages collected from the nineteen prepared parts, with illustrations and editorial notes. Some passages in the prepared parts are condensed or paraphrased; this compilation is not certified as a complete, line-by-line translation.

Printed pages 17 and 18 are absent from the supplied source scan. No content has been invented to fill that gap.

The medical material is historical, not current clinical guidance. Text, terminology, figures and doses require author and scientific review before publication.

Original part-level pagination is retained. PDF bookmarks provide navigation. Arabic labels within archival illustrations are retained; the explanatory text is in English.

Infertility

Its Causes and Advances
in Treatment

By
Professor Dr.
Taher Abdel Rahim Shaheen

Dedication

To my beloved father, who gave me strength and determination and shaped the man I became. To me, he is like a river that never runs dry.

To my mother, dearest of all, the kindest and most tender soul in the world, who gave me life and nurtured me with affection and love. Through her prayers, I became who I am.

To my wife and lifelong companion, who shared life's joys and hardships with patience and fortitude, surrounded me with love, tenderness and care, and enriched my life with steadfast faith, selflessness and patience in adversity.

I dedicate this book to them all, acknowledging, after God, all that I owe them and expressing my gratitude for their kindness.

Introduction and Premarital Medical Examination

Professor Dr. Taher Abdel Rahim Shaheen

Part Two • Arabic and English Review Edition

Editorial Note

This part reproduces printed pages 1–4 of the book alongside their English translation. Organisational headings and new page numbering have been added for readability, with limited spelling corrections.

The medical opinions and figures in the source have been retained and have not been scientifically updated. They are not presented here as current medical recommendations. The passages on marriage between relatives, diabetes, the Rhesus factor, herpes transmission rates and the definition of infertility require the author's scientific review before this edition is approved for publication.

The abbreviation “HR” has been retained as printed in the scanned source and requires terminology review.

Introduction

From a scientific perspective, infertility is the inability to conceive after one to two years at most of married life without using any method of contraception. People have mistakenly associated infertility with women. There has also been a mistaken belief that the woman, rather than the man, is responsible because she is the one who carries and delivers the baby, whereas a man who is able to have sexual intercourse cannot be the cause of infertility.

As science has advanced, research has shown that men and women are equally responsible for infertility. When pregnancy has not occurred after a sufficient period of marriage, both partners should preferably consult a physician. The husband is examined first; if no abnormality is found, the search for a cause begins with the wife. The causes of male infertility naturally differ from those of female infertility. Treating these causes may make pregnancy possible.

Both partners may nevertheless have normal examinations and test results, yet pregnancy does not occur. Such cases remain a subject of scientific research to identify their causes.

The study of infertility therefore concerns both husband and wife. We will discuss its causes and treatment in men and then in women, its relationship to other diseases in either partner, and the various treatment methods. We will begin by examining male infertility.

Premarital Medical Examination

Before discussing infertility, we will address a related general topic: premarital medical examination and its importance in establishing a healthy family, despite its limited use in our communities. Part of this examination assesses sperm cells in men, as a reduced sperm count can lead to infertility. It may also help limit the spread of sexually transmitted diseases by detecting disease or infection so that it is not passed between partners, and by treating any condition identified.

Some people seek medical examination because they experienced illnesses in childhood or youth, such as mumps or sexually transmitted diseases, to obtain reassurance about their own health and that of their future children.

Scientific studies and research have shown that hereditary traits and diseases are more common in marriages between relatives, because the likelihood of both parents sharing the same disease-associated traits increases with the closeness of their relationship. Modern medicine therefore discourages marriage between relatives when a family has hereditary diseases, to prevent their transmission to children.

If, however, the family is healthy and free of hereditary diseases, or is known for particular qualities such as intelligence, we favour and encourage marriage between relatives in such cases.

Premarital medical examination includes urine and blood testing to identify several diseases and factors that may affect health and offspring, as follows:

Blood Groups

Each person has a particular blood group. One especially important factor is the Rhesus factor, referred to in the source as “HR.” It has been found that 85% of people have the positive “HR+” factor, meaning that their red blood cells carry it, while the other 15% are negative, “HR–,” meaning that their red blood cells do not carry it. If positive red blood cells enter the body of a person who is negative, the body produces antibodies against them in the blood plasma.

If a man who is positive for this factor marries a woman who is negative, the fetus may inherit the father's positive status while the mother remains negative. Contact with fetal blood can lead to antibody production. These antibodies pass through the placenta and umbilical cord into the fetal circulation, where they destroy red blood cells and cause severe fetal anaemia, which may affect the brain and lead to death. It is therefore necessary to know the blood groups of couples planning to marry so that the required precautions can be taken during pregnancy and delivery, avoiding the risks of antibody formation and preventing fetal complications.

Other Premarital Tests

Reproductive Capacity

A man's semen analysis indicates his reproductive capacity. Sometimes, despite good health and sexual function, a man discovers that previous illnesses have left his semen without sperm cells, resulting in infertility and an inability to father children. This may cause social difficulties that can be avoided if the condition is identified early.

Diabetes Mellitus

If both partners have diabetes, it is considered preferable not to proceed with the marriage, because of the possibility that most of their children may develop the disease. Early detection of diabetes in the wife also allows careful monitoring during pregnancy to prevent complications.

Rubella

A blood test determines whether immunity to rubella is present. If the wife is not immune, she should receive an immunising injection before marriage to protect her against the disease, because infection during the first months of pregnancy may result in the birth of a child with congenital abnormalities.

Sexually Transmitted Diseases

Diseases such as gonorrhoea, infections and syphilis can be transmitted between partners. They may lead to serious complications, including infertility, miscarriage or transmission of syphilis to the child through the placenta, known as congenital syphilis.

It is also important that the woman be free of genital herpes. This infection can lead to miscarriage, and delivery in its presence results in infection in 50% of newborns, who often die or develop neurological disease and intellectual disability.

This demonstrates the importance and necessity of premarital medical examination in general, and particularly for relatives planning to marry, with the aim of a happy marriage and a healthy family, God willing.

We now return to infertility in men and women to discuss its causes and treatment.

Chapter One: Male Infertility

Professor Dr. Taher Abdel Rahim Shaheen

Part Three • Arabic and English Review Edition

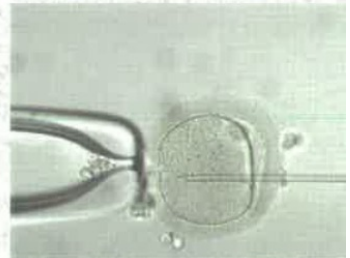
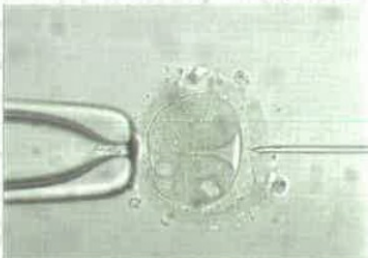
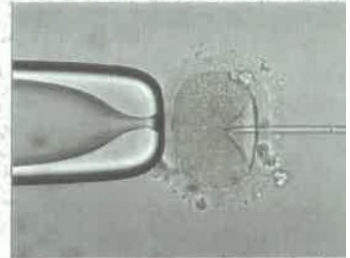
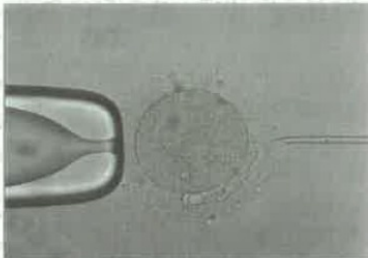
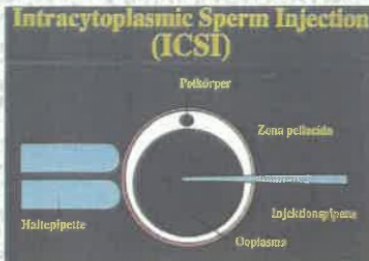
Editorial Note

This part contains the illustration of the stages of intracytoplasmic sperm injection, followed by printed pages 5-6 and their English translation.

The medical opinions and figures have been retained as printed and are not presented as current recommendations. The figures for semen volume and concentration, morphology, motility and pus cells, as well as the stated drug uses, require the author's scientific review before final publication.

The spellings "clomiphene" and "tamoxifen" have been standardised in the English translation, while the Arabic text continues to represent the printed source.

Stages of Intracytoplasmic Sperm Injection (ICSI)



Chapter One

Male Infertility

Male infertility has many causes. Some relate to the sperm themselves, while others concern their ability to reach the ovum.

The following section presents these two groups of causes.

1. General Causes of Male Infertility

A. Causes Related to Sperm Production

Sperm cells develop within cells in the testicular tissue. Their cycle of development from its beginning to maturity may range from six weeks to three months. As stored sperm age within the ducts surrounding the testis, their fertilising capacity decreases.

Each ejaculate contains some immature sperm, some normal sperm, and others that are abnormal or aged. Sperm numbers vary markedly from one man to another. Several factors affect sperm production, including temperature: the testis does not function at full efficiency at body temperature or above it, which is why the scrotum lies outside the body.

There is evidence that sperm production decreases in summer, particularly among those who are not accustomed to living in hot climates.

The source states that the optimal semen volume associated with pregnancy is 2-5 cubic centimetres, and that sperm concentration should not be below 20 million per cubic centimetre.

Male Infertility

Pregnancy may occur at substantially lower values, although the chance is low. When the count is below 20 million, one or more causes may be present, including varicocele, inflammation of the male reproductive tract, an undescended testis, alcohol or drug dependence, exposure to radiation, or certain toxins.

Medication use and a person's psychological and emotional state are also described as important to sperm production. Other factors may affect reproductive function and reduce production, including acute illnesses such as colds, viral infections, and environmental factors such as temperature.

Normal sperm morphology is also important. Some sperm have a large or small head, two heads, no head, two tails, or no tail. A motile sperm with an oval head and a single tail is able to penetrate and fertilise the ovum. The source states that abnormal forms should not exceed 40% and that pus cells should not exceed the medically acceptable limit determined by the physician.

B. Causes Related to the Sperm's Ability to Reach the Ovum

For sperm to reach and penetrate the ovum, adequate motility is required. The source states that the normal motility associated with conception is 60% or more and that movement should be active. Causes of impaired semen quality include varicocele, inflammation, immune disorders directed against sperm, and medicines that are harmful to sperm.

The pituitary gland stimulates the testis to perform its function. The source mentions medicines such as clomiphene or tamoxifen as stimulating the pituitary gland and thereby stimulating testicular function. It also states that androgen secreted by the testis is responsible for sperm formation.

Male Infertility

Professor Dr. Taher Abdel Rahim Shaheen

Part Four • Arabic and English Review Edition

Editorial Note

This part presents printed pages 7-10 with their English translation, organised headings, and limited spelling correction.

The opinions, figures and treatments have been retained as printed and are not presented as current medical recommendations. The passages concerning nocturnal emissions and masturbation, their stated effects, prostatitis rates, cellular criteria in prostatic fluid, treatments and medicine names require the author's scientific review before final publication.

The source contains non-standard spellings of some medical terms and medicines. Standard medical terminology has been used in the English translation while preserving the source meaning.

Male Infertility

2. Nocturnal Emissions, Masturbation, and Their Stated Relationship to Sp

Nocturnal emission is a natural phenomenon in males after puberty and is usually accompanied by sexual dreams. Its frequency varies from one person to another: it may occur two or three times in one week, or may not occur for a month or longer. The source describes this as normal. It also lists factors said to promote nocturnal emissions, including frequent sexual thoughts during the day, viewing sexually explicit material, psychological disturbance, and friction of the genital organs.

The source also discusses frequent masturbation and states that a person may sometimes feel tired the following morning or experience headache and pain in the back and joints, together with psychological symptoms such as low mood. It says that such symptoms may be more common among adolescents who fear that loss of semen through nocturnal emission will impair sexual function after marriage, while stating that this fear has no scientific basis. It adds that nocturnal emissions may become problematic if they occur daily or cause psychological harm, and asserts that frequent episodes may lead to premature ejaculation.

Masturbation is described as self-stimulation to achieve sexual pleasure. The source cites figures of 95% of men and 80% of women having masturbated at least once. It lists claims historically attributed to masturbation, including physical weakness, forgetfulness, anxiety, visual impairment, flaccidity, premature ejaculation, and even insanity.

The source then says that accepting all such claims without qualification may be exaggerated, while maintaining that masturbation is an abnormal practice whose harms may be avoided through appropriate upbringing, and that guilt, shame and psychological pressure are among its principal complications.

Male Reproductive Tract Infections

The source asserts that excessive masturbation in adolescence leads to reduced reproductive capacity, fewer sperm available for conception, prostatitis and premature ejaculation. For women, it states that masturbation may cause microbial infection at the site of practice, with possible spread to the bladder and kidneys, and that mucous glands of the labia may become obstructed, causing marked swelling and inflammation.

3. Inflammation and Infection of the Male Reproductive Tract

Infections affecting the male reproductive tract may reduce fertility by causing sperm aggregation or deposition, reduced motility, abnormal sperm development, or impairment of motility and fertilising capacity.

A. Prostatitis

Prostatitis is acute or chronic inflammation of the prostate gland, which lies below the bladder. The source states that the prostate produces about 30% of the fluid carrying sperm and that prostatitis affects 35% of men over the age of fifty. It says that bacterial infection accounts for some cases, although most causes remain unknown. An inflamed prostate may compress the urethra and obstruct urine flow.

Symptoms listed include fever, chills, difficulty urinating, repeated urgent urination, pain during and after urination, a sensation of incomplete bladder emptying, pain during intercourse, blood in semen, and erectile or sexual dysfunction in some cases of chronic prostatitis. The source states that prostatitis is treated with antibiotics and mentions modern devices for treatment.

Prostatitis

The source mentions microwave and laser devices for treating inflammation. Surgery may be performed to drain a prostatic abscess. It also refers to research on treatment of prostatic enlargement by electrovaporisation. Another described method is collection of prostatic fluid by digital prostatic massage through the rectum. It instructs the patient to abstain from intercourse for three days before massage and to empty the bowel and bladder several hours beforehand, with the patient positioned on the knees during the procedure.

Prostatic fluid may also be examined. The source describes prostatic cells as rarely present in what it calls “marrow fluid”; these cells are said to be regular in size and shape, arranged in groups, and elongated or cuboidal. Seminal-vesicle cells are said to occur in about 10% of patients, singly or in small groups, with irregular size and shape. Yellow or orange pigments may also be present. It further states that bladder cells may be abundant and that sperm may sometimes be seen. An abnormal specimen is described as containing increased cells.

The source states that the presence of ten cells in prostatic fluid indicates inflammation, spelling the term “natrophil,” and recommends repeated prostatic massage. It also states that increased cells in semen and prostatic fluid are associated with male infertility. The cellular terminology in this paragraph requires specialist review.

Glands and Hormonal Causes

B. Inflammation of the Male Accessory Glands

In some recorded cases, the source reports reduced zinc and acid phosphatase in association with inflammation of the male sex glands. It also reports reduced testosterone secretion in cases of prostatitis.

Treatment of Inflammation of the Male Glands

The source lists prostatic massage in selected cases and names several medicines. The printed spellings appear to correspond to ampicillin, erythromycin, doxycycline, minocycline, a cephalosporin, thiamphenicol, co-trimoxazole (Bactrim), and metronidazole (Flagyl). It describes these as antibiotics active against Gram-negative and Gram-positive bacteria. It also lists aspirin, indomethacin and phenylbutazone. All medicine names and indications require specialist review.

C. Inflammation of the Accessory Reproductive Organs

Such inflammation may affect the epididymis and vas deferens, changing their size, shape or contents. The vas deferens may be palpated during examination of the scrotum, and diagnosis may involve a testicular specimen. Inflammation may also affect the prostate and seminal vesicles, which the source says may be assessed rectally or by computed tomography.

4. Hormonal Causes

Endocrine disorders may affect glands responsible for hormone secretion, including the pituitary, thyroid and adrenal glands. This may increase or decrease their secretions. The source refers to excessive or insufficient pituitary production of gonadotrophins that regulate testicular function, and states that overactivity or underactivity of the thyroid and adrenal glands may also affect testicular function.

Hormones and Male Fertility

Professor Dr. Taher Abdel Rahim Shaheen

Part Five • Arabic and English Review Edition

Editorial Note

This part presents printed pages 11-14 with their English translation, organised headings, and limited spelling correction.

The opinions, figures, doses and treatments have been retained as printed and are not presented as current medical recommendations. The hormonal terms LH-RH, FSH-LH, MRH and H; medicine names and doses; treatment of hyperprolactinaemia; antibody thresholds and corticosteroid treatment; and management of varicocele and hydrocele require the author's scientific review before final publication.

Standard medical terminology has been used in English where possible. Ambiguous printed phrases are identified rather than silently corrected.

Hormones and Male Fertility

LH-RH and Related Analogues

The source discusses LH-RH and related analogues for low sperm count. It describes the hormone as a chain of ten amino acids and states that it was extracted from sheep and pigs. Some amino acids are said to mediate its physiological effects and others its receptor binding in tissues. Synthetic analogues are described as increasing pituitary secretion of "FSH-LH." In some men with infertility, low sperm count is said to coexist with normal FSH-LH and testosterone; the text therefore proposes that additional testicular stimulation with these hormones may increase sperm count.

Raised Prolactin and Reduced Male Fertility

Prolactin is secreted by the anterior pituitary. The source refers to hypothalamic substances that stimulate its secretion and describes dopamine in a physiologically inconsistent sentence that requires review. It lists medicines said to raise prolactin, including phenothiazines, a printed name resembling domperidone, some antidepressants, methyldopa, oestrogens, morphine, metoclopramide and methadone. It lists bromocriptine and metergoline as lowering prolactin.

Prolactin in Men

The source gives an average prolactin level of 2-15 ng/mL in men and states that prolactin affects 5-alpha-reductase. It says that an elevated blood level reduces testosterone production and sperm count.

Prolactin and Gonadotrophins

Raised Prolactin in Men

Prolactin may be elevated in anterior pituitary tumours, some cases of meningitis or encephalitis, and tumours compressing the pituitary. The source also notes elevation in renal failure and relates this to increased oestrogen. It states that dialysis does not normalise prolactin in this setting, whereas kidney transplantation does.

Treatment of Raised Prolactin

The printed text lists: (1) stopping medicines that raise prolactin; (2) excision or treatment of pituitary tumours; (3) kidney transplantation in renal failure; and (4) “use of prolactin” at 1.25-2.5 mg two or three times daily. The final item is almost certainly a terminology error and requires author review before publication.

Use of Gonadotrophins in Male Infertility

The source describes pituitary gonadotrophins as FSH and a hormone printed as “H.” FSH is said to act on the seminiferous tubules to increase sperm production, while “H” stimulates Leydig cells to secrete testosterone. A releasing hormone printed as “MRH” is described as stimulating their secretion, while increased testosterone suppresses these hormones by feedback.

Gonadotrophin Preparations

Human chorionic gonadotrophin (hCG) is described as being extracted from the urine of women during the first three months of pregnancy and prepared commercially in doses of 2,000-4,000 units. It acts on receptors on Leydig cells and stimulates testosterone secretion. The printed unit “units/mg” requires review.

FSH and Immunological Subfertility

FSH Preparation

The source describes extraction of this hormone from the urine of postmenopausal women. It identifies a preparation called Pergonal, with each ampoule containing 75 units of FSH and 75 units of LH.

Use in Infertility Treatment

The printed text describes hCG, under a name rendered as “Hiosan,” at 3,000 units three times weekly for 6-12 months. It also gives FSH at 75-150 units two or three times weekly for 5-10 months, stating that this increases sperm count in men with oligozoospermia due to low gonadotrophin levels. These regimens require contemporary specialist review.

5. Immunological Subfertility in Men

The source states that semen contains foreign antigens capable of stimulating antibody production. Normally, the blood-testis barrier prevents these antigens from entering the circulation and therefore limits antibody formation; the text also attributes an antibody-inhibiting property to seminal fluid.

Causes of Antibody Formation

No clear cause is identified in some cases. Other listed causes include genitourinary inflammation, surgery for inguinal hernia, testicular trauma and testicular operations.

Effect of Antibodies on Fertility

The source gives historical antibody titres: 1:32 in blood is said not to affect fertility; 1:64 to 1:512 is said to reduce fertility; and a titre above 1:512 in semen is said to cause infertility. These thresholds and testing methods require scientific review.

Antibodies, Varicocele and Hydrocele

Treatment of Antibody-Associated Subfertility

The source lists treatment of genital inflammation; sperm washing to remove antibody-containing seminal plasma followed by injection through the cervix for fertilisation; and corticosteroids. It prints a prednisone regimen of “60 to 20 mg” for one week, repeated monthly for three months. This regimen is ambiguous and requires specialist review.

6. Varicocele

A varicocele is described as a group of dilated, tortuous veins within the scrotum. The source associates it with changes in sperm, including reduced motility and increased abnormal forms.

Surgical treatment is described as ligation of the spermatic vein, with improvement in sperm quality and count. The text also describes a non-surgical technique in which monoethanolamine oleate is injected into the vein through a catheter to produce thrombosis within the varices. Contemporary indications, agents and technique require review.

7. Hydrocele

A hydrocele is a collection of fluid between the coverings of the testis, usually unilateral and possible at any age. The source distinguishes a primary hydrocele, without other scrotal disease and attributed to secretion exceeding absorption, from a secondary hydrocele due to inflammation, trauma, torsion or a testicular tumour. It states that hydrocele raises scrotal temperature, may reduce sperm count, and when large may impair testicular circulation and cause atrophy. It reports improvement in sperm function and count after surgical treatment.

Congenital Causes and Sexual Dysfunction

Professor Dr. Taher Abdel Rahim Shaheen

Part Six • Arabic and English Review Edition

Editorial Note

This part presents the available printed pages 15, 16, 19 and 20 with English translation, organised headings, and limited spelling correction.

Printed pages 17 and 18 are absent from the source scan. Their content has not been guessed and can be inserted in sequence if the missing pages become available.

The historical opinions and treatments have been retained and are not current medical recommendations. The passages on spermatocoele, congenital causes, sexual dysfunction and erection, chronic and infectious disease, AIDS, paralysis, psychiatric medicines and hormones require the author's scientific review before final publication.

Spermatocele and Congenital Causes

Printed page 15

Spermatocele

Obstruction of the small ducts at the head of the epididymis may produce a cystic swelling containing sperm, termed a spermatocele. The source states that a large lesion may interfere with sperm transport through the epididymis and impair development.

It also mentions epididymal tumours, either cystic or solid, which may coexist with a spermatocele. It gives historical outcome figures, stating that in 25% of cases surgical treatment increases sperm count in 50% of patients; this statement is unclear and requires review.

8. Congenital Causes of Infertility

These include congenital abnormalities of the male reproductive system present from birth, as well as acquired causes. The source describes congenital absence of the spermatic ducts that carry sperm from the testis and epididymis out of the reproductive tract. It also lists obstruction of the epididymis or spermatic ducts, congenital testicular abnormalities, and abnormalities of the penis that affect its form or function. One printed phrase appears to confuse the fallopian tube with the urethra and requires author correction.

The source also refers to genetic abnormalities that may cause germ-cell atrophy and congenital penile deformities. Penile abnormalities caused by congenital defects, surgery or external injury may prevent normal erection and produce sexual dysfunction.

9. Failure to Conceive because of Male Sexual Dysfunction

This common term has several meanings and may refer to reduced sexual capacity or its complete absence.

Sexual Dysfunction and Erection

Printed page 16

Male Sexual Dysfunction

Male sexual dysfunction is a common complaint and may be associated with age, chronic disease, psychological factors, prescribed medicines or poor nutrition. The source describes its social consequences for the family and the marital relationship, and states that it should be treated like any other medical disorder.

Responsibility is presented as shared between both partners rather than resting on the man alone, because acceptance and mutual consent are important conditions of a successful continuing marital relationship. Failure to achieve an erection is identified as a major cause of sexual dysfunction.

How Does an Erection Occur?

An erection follows sexual stimulation through the senses, including hearing, smell, sight and touch. Erection is the penile rigidity required for sexual function.

It results from increased arterial inflow into and around the penis. The feeding arteries dilate and their pressure increases, while venous outflow is restricted so that blood is retained before intercourse.

Chemical mediators coordinate arterial dilatation and venous restriction through biochemical pathways. The source states that erection persists while arterial inflow and venous return remain in the appropriate balance.

Chronic and Infectious Diseases

Printed page 19 - pages 17 and 18 are missing

4. Chronic Diseases

The source mentions tuberculosis, including the emergence of drug-resistant strains, as well as typhoid and other illnesses that damage general health, cause fatigue and reduce capacity for sexual activity.

It also describes malnutrition as a factor contributing to sexual dysfunction and reduced sexual desire.

5. Infectious Diseases: A. Gonorrhoea

Gonorrhoea is a bacterial infection transmitted principally through sexual contact. The source also claims transmission through contaminated personal articles such as unclean underwear; this requires correction. It describes urethral inflammation, swelling, painful urination, extension to the prostate, purulent discharge, psychological distress, sexual dysfunction and possible infertility if infection is untreated.

B. Syphilis

Syphilis is a sexually transmitted infection. The source describes skin rash or nodules, ocular involvement that may cause blindness, and lesions of the mouth and tongue. A printed phrase referring to additional organs is unclear; it also mentions possible involvement of the bladder and testes.

HIV, Neurological and Psychiatric Causes

Printed page 20

Because of its manifestations and complications, the source states that syphilis may contribute to infertility in men and women.

C. Acquired Immunodeficiency Syndrome (AIDS)

The source describes AIDS as a severe modern disease and links it to what it calls abnormal sexual relationships. It says that the disease destroys immune defences, was then without treatment, and may lead to death, infertility and sexual dysfunction. This paragraph requires substantial scientific and non-stigmatising updating: HIV has multiple routes of transmission and effective antiretroviral therapy is now available.

6. Neurological Disease and Paralysis

Neurological disease may impair erection and cause sexual dysfunction. The spinal cord may be affected by traumatic injury, tumours or vertebral disc disease, which can interfere with sexual function.

7. Depression and Psychiatric Illness

Depression, anxiety, stress and nervous tension may reduce interest in sexual activity. Some medicines used to treat psychiatric conditions may also adversely affect sexual function.

8. Testicular Disorders

The source states that reduced testosterone together with increased prolactin may impair testicular cellular function, further reduce androgen activity, and impair fertility or sexual function.

Causes of Dysfunction and Male Infertility Treatment

Professor Dr. Taher Abdel Rahim Shaheen

Part Seven • Arabic and English Review Edition

Editorial Note

This part presents printed pages 21-24 with English translation, organised headings, and limited spelling correction.

The opinions, percentages and treatments have been retained as printed and are not current medical recommendations. Claims about diseases, alcohol, drugs, smoking and medicines; psychological and behavioural explanations; and the named medicines, hormones, operations and insemination methods require the author's scientific review before final publication.

The English translation avoids stigmatising language and distinguishes the historical source from contemporary medical information without changing its intended meaning.

Disease, Alcohol and Drugs

Printed page 21

The source estimates that testicular disease accounts for about 25% of all cases of sexual dysfunction.

It lists kidney and liver disease, leukaemia, bladder cancer, prostate cancer and other illnesses as possible causes of sexual dysfunction.

It also states that thyroid disease may impair sexual function through altered secretion of hormones directly or indirectly related to sexual function, naming gonadotrophins and thyrotrophin.

9. Alcohol and Drugs

The source states that alcohol and psychoactive drugs may inhibit sexual capacity and impair judgement and behaviour.

It reports that more than 50% of people dependent on certain opioid derivatives had sexual dysfunction, and refers to an opioid-blocking medicine used in treatment. The exact medicine and the source of this figure require review.

Cannabis is described as affecting sensory centres in the brain and altering perception, despite a belief among some users that it enhances sexual performance.

Smoking

The text links nicotine with atherosclerosis, cardiac effects, impaired circulation and reduced sexual response.

Medicines and Psychological Causes

Printed page 22

Many prescribed medicines may have adverse sexual effects. The source lists antihypertensive and cardiac medicines, anti-anginal medicines, lipid-lowering drugs, antihistamines, cancer treatments and psychiatric medicines. The effect depends on the specific medicine and patient and requires clinical review.

Second: Psychological Causes

The source attributes psychological barriers partly to inadequate family education, leaving children without reliable sexual-health knowledge and making discussion of the subject frightening or shameful.

It describes adolescents discussing sex secretly and receiving inaccurate information, while open discussion is discouraged at home, school and elsewhere.

Fear, guilt and anxiety may then become associated with sexual activity and may interfere with marital sexual function or lead to avoidance.

The text also describes recourse to superstition and fraudulent healers, particularly where traditional beliefs attribute sexual difficulty on the wedding night to supernatural restraint.

Anxiety and fear during a first sexual experience may contribute to situational erectile or sexual difficulty and an inability to complete intercourse.

Behavioural Causes

Printed page 23

Third: Behavioural Causes

The source discusses concepts and information concerning sexual activity, dividing them into the following categories:

1. Lack of Sexual-Health Information

It recommends education that is consistent with religious and ethical values, including references to the Qur'an and the Prophetic traditions.

2. A Distressing or Unsuccessful Early Experience

An early unsuccessful sexual experience, particularly before marriage as described in the source, may lead a person to associate sex with failure, frustration and later sexual difficulty.

3. Anxiety and Psychological Stress

The person's wider circumstances may adversely affect sexual function through anxiety and stress. Examples include unsuitable work and difficult relationships with colleagues, family or relatives, whose psychological effects may carry into intimacy with a spouse.

4. An Unstable Marital Relationship

Lack of mutual acceptance may negatively affect sexual intimacy and create emotional distance between partners.

Other causes of distance may include excessive preoccupation with work by either spouse and neglect of family life, leading to reduced desire that may be described as sexual dysfunction.

Treatment of Male Infertility

Printed page 24

Treatment of Male Infertility: First, Medicines

The source describes limited use of medicines to increase reproductive hormones when levels are low, attributing this to hypothalamic dysfunction and naming Kallmann syndrome.

It mentions clomiphene citrate (Clomid), an anti-oestrogen, for unexplained infertility.

Clomiphene is described as stimulating the hypothalamic-pituitary axis and increasing FSH, LH and testosterone.

The source also describes direct use of FSH in some cases of unexplained infertility, claiming improvement in fertilisation and time to pregnancy rather than sperm quantity. These indications require specialist review.

Surgical Treatment

The surgical section describes treatment of varicocele, including minimally invasive approaches. Its statement that varicocele affects “sperm arteries” is anatomically imprecise.

It also refers to endoscopic or biopsy diagnosis of inflammation or obstruction of the spermatic tract and names “Proximol,” a medicine whose indication here is unclear and requires review.

Second: Artificial Insemination

The source describes using healthy sperm and introducing it into the woman’s uterus to achieve fertilisation without sexual intercourse.

Artificial Insemination and Female Infertility

Professor Dr. Taher Abdel Rahim Shaheen

Part Eight • Arabic and English Review Edition

Editorial Note

This part presents printed pages 25-28 with English translation, organised headings, and limited spelling correction.

The insemination routes, timing, success rates, contraindications and fertility definitions have been retained as printed and are not current medical recommendations. Sample volumes, semen preparation, procedure timing, listed contraindications, success figures, and the terms fecundability and fecundity require the author's scientific review before publication.

Printed page 28 begins Chapter Two, "Female Infertility," and the layout makes this transition explicit.

Routes of Artificial Insemination

Printed page 25

The source describes this treatment for difficulty with intercourse, including ejaculatory difficulty or psychogenic sexual dysfunction.

Routes of Insemination

It lists cervical, intrauterine, upper uterine, tubal, fallopian-tube and intraperitoneal insemination. Some of these descriptions overlap or use non-standard terminology and require review.

Intrauterine insemination is described as the most commonly used route, with about 3 mL of concentrated sperm placed into the uterine cavity through a catheter around ovulation.

Cervical insemination is said to be less effective than intrauterine insemination. Tubal insemination is described as using a larger volume, approximately 4 mL, with an added fertility hormone printed as "CG." Intraperitoneal insemination is mentioned for inflammation of the uterine cavity. These claims and volumes require current specialist review.

Method

The source identifies two main factors: the insemination route and the number and timing of procedures.

Semen Collection and Preparation

The printed text says that seminal plasma may hinder entry into the uterine cavity or provoke uterine or allergic reactions through prostaglandins that stimulate contraction. The sentence continues on the next printed page.

Semen Preparation and Contraindications

Printed page 26

The source continues by recommending highly purified, washed semen, free of substances that stimulate uterine contraction. It says some preparations contain motility stimulants and recommends centrifugation to concentrate the sample and remove cells or substances described as inactive, abnormal or related to an enzyme printed as “phosphatase.” It then gives intervals of 24-48 hours for improved function and 12-24 hours after ovulation for fertilisation. The terminology and timing are unclear and require review.

Timing is described as critical and should coincide with ovulation. The source gives an insemination window of 18-42 hours after administration of a hormone described as “growth hormone,” which is likely a terminology error.

Contraindications or Barriers

The source states that the procedure is undertaken with the agreement of both spouses and then lists influencing factors:

1. Procedure-related conditions, including a preference for fresh rather than cryopreserved semen, which the source says has greater fertilising capacity.
2. Infections such as HIV, sexually transmitted infections, hepatitis C, syphilis, gonorrhoea and chlamydia, because infection may be transmitted. Modern assisted-reproduction practice uses screening and risk-reduction protocols rather than this broad historical exclusion.

It also lists family histories of infertility and genetic or systemic disease, naming uterine fibrosis, a term resembling haemophilia, Huntington disease, inherited intellectual disability, diabetes and heart disease. The statement that all such conditions prevent insemination is not current and requires genetics and fertility-specialist review.

Factors Affecting Insemination Success

Printed page 27

Factors affecting insemination outcome include prompt treatment and the ages of both partners. The source states that among couples younger than 30 with otherwise unexplained infertility, the success rate exceeds 60% after approximately 12 monthly treatment cycles.

Treatment duration is also described as important. After 12 insemination attempts over about one year, the source recommends moving to another treatment method.

The partners' social and psychological circumstances are also said to influence treatment success. These historical success estimates should be replaced with outcome data specific to diagnosis, age, semen parameters, ovarian stimulation and treatment setting.

Chapter Two: Female Infertility

Printed page 28

Chapter Two: Female Infertility

Introduction

The source defines infertility as failure to conceive after one year of intercourse without contraception and estimates that it affects about 10%-15% of couples of reproductive age. It defines fecundability as the probability of conception in one menstrual cycle, given as about 25% in couples without infertility, and fecundity as the ability to achieve a live birth. The source identifies three developments in infertility care:

First: the possibility of conception outside the body and the associated assisted reproductive technologies, including in-vitro fertilisation, creating new treatment opportunities and advancing the study of fertility.

Second: greater public health awareness and interest in modern treatment, leading more people to seek evaluation at fertility centres and follow newer methods. The source also links the apparent increase in infertility consultations partly to older age.

Third: later marriage and a growing number of women over 30 seeking treatment. It states that in the United States one in five women has her first child after age 35, attributing this to later marriage, elective delay of pregnancy or childbirth, education, work and economic circumstances. This statistic requires verification.

Diagnostic Images, Age and Fertility

Professor Dr. Taher Abdel Rahim Shaheen

Part Nine • Arabic and English Review Edition

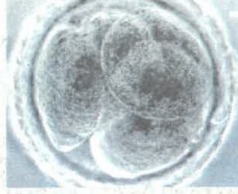
Editorial Note

This part includes the medical image plate preceding printed page 29, followed by printed pages 29 and 30 with English translation.

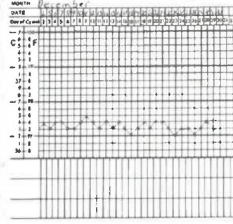
A blank page follows the image plate in the source scan; it has been omitted without loss of content.

Historical figures concerning infertility services, age, miscarriage and disease have been retained as printed and are not current statistics. Every percentage, date and cited study requires source verification and updating before final publication.

Diagnostic Image Plate



بويضة ملقحة ذات الأربع خلايا



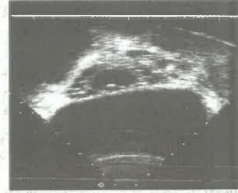
تحديد موعد التبويض باستخدام حرارة الجسم



قنوات فالوب المفتوحة بإحدى الصبغات المميزة



اشعة تليفزيونية فوق صوتية توضح جنين في الاسبوع الخامس من عمره



صورة للمبيض يحمل أكياس البويضات



رحم مزدوج صورة بأشعة الصيغة

1. Four-cell fertilised embryo.
2. Transvaginal ultrasound showing a pregnancy at approximately five weeks.
3. Ovulation timing chart using basal body temperature.
4. Ultrasound image of an ovary containing follicles.
5. Laparoscopic view of patent fallopian tubes after coloured dye.
6. Contrast radiograph showing a duplicated uterus.

Growing Attention to Infertility

Printed page 29

Growing Attention to Infertility

The source states that in 1982 approximately one in five married women of reproductive age received medical assistance for infertility. It then gives a series of dates and service-use figures that appear internally inconsistent, including references to 1981, 1970 and 1980 and growth from about 600,000 to one or two million cases. These figures require verification against the original sources.

It states that between 1982 and 1988 the number of women receiving infertility assistance increased by 25%, from one million to 1.35 million.

The source reports little change in the proportion of childless couples around 1980, but gives several US estimates for 1988: 7% of wives of reproductive age described as infertile; 13.9% among women aged 15-44 after excluding surgical sterility; 8.4% reporting impaired fecundity, equivalent to about 4.9 million women; and about 25% experiencing infertility or delayed conception during reproductive life. These definitions and estimates require source checking.

Why, Then, Did Infertility Receive Greater Attention?

The source argues that even if the proportion of childless couples changed little, the absolute number increased as women born around the Second World War delayed marriage and childbearing. It cites increases from 1982 to 1988 among women aged 35-44 without children and age-specific figures for impaired fertility. It also attributes greater attention to improved treatment, higher-quality health care, publicity, family planning, wider access to services, and greater diagnostic knowledge among physicians, making infertility a prominent social concern.

Age and Fertility

Printed page 30

The source describes the generation born around the Second World War as facing distinctive social changes and being among the first to use family planning and delay marriage and pregnancy, thereby changing the context in which infertility was experienced.

Age and spontaneous miscarriage can affect reproduction. The source gives miscarriage rates increasing from 10% by age 30 to 18% after age 30 and 34% in the early forties. These historical percentages require modern verification.

It also states that women over 30 may experience more illnesses that affect fertility and greater exposure to environmental pollution. Sexually transmitted infections are identified as an additional factor that may damage the fallopian tubes.

Age and Fertility: How Does Age Affect Fertility?

The source discusses historical studies of Hutterite communities living in Dakota, Montana and areas near the Canadian border. It states that communities settled in South Dakota around 1870, initially comprising about four colonies with 443 people, and expanded by 1950 to a population of 8,542. Contraception was reportedly prohibited and families were encouraged to have children.

It attributes fertility studies in this population to an investigator from Western Reserve University. Among 209 women, five were childless, giving a reported infertility rate of 2.4%. The mean age was 41. Fertility declined with age: the source reports that 11% had ceased childbearing after age 34, 33% were infertile by age 40, and 87% by age 45. The investigator's name and all figures require citation verification.

Age, Fertility and Ovarian Changes

Professor Dr. Taher Abdel Rahim Shaheen

Part Ten • Arabic and English Review Edition

Editorial Note

This part covers printed pages 31-34 and discusses female and male reproductive ageing, pregnancy risks, and age-related ovarian and hormonal changes.

Historical studies, figures and percentages are retained as printed. They are not presented as current medical evidence or recommendations.

Author review and source verification are required, particularly for pregnancy and miscarriage rates, follicle-pool figures, the wording of the French study, and some statements about paternal age.

Age and Fertility

Printed page 31

The study concluded that fertility in these communities could remain high while people were healthy, socially stable and did not use contraception. With early marriage, and in the absence of amenorrhoea, infertility or reduced intercourse, a woman could reportedly give birth about 15 times.

The source then describes a French study based on pregnancy rates in a fertilisation programme. Its wording concerning women whose husbands had no semen and women married to men with low sperm counts is unclear and requires author and source review. It reports an age-related fall in pregnancy rate: 74% below age 31, 62% at age 35, and 54% after age 35.

Several American studies are said to have demonstrated a relationship between age and conception or childbirth and to have encouraged greater attention to treatment of older women. The source states that the likelihood of a healthy fetus fell by 30% after age 30, and that a woman over 35 had a 50% chance of a healthy child compared with a woman aged 25. The precise meaning and basis of these historical figures require verification.

The decline in fertility among couples marrying at an older age is presented as an important concern. A woman marrying in her thirties may encounter infertility, and the source states that at least half of women are affected by age 40.

The source attributes much of the lower birth rate at older ages to spontaneous miscarriage. It gives historical miscarriage estimates of 12% up to age 20, 26% at age 40, and approximately 75% after age 40. These percentages require checking against current evidence and the cited sources.

Male Fertility and Pregnancy with Age

Printed page 32

Male fertility may persist into advanced age, and many older men remain capable of fathering children. The source gives an example of a man aged 90 marrying a woman aged 20 and having a child with her.

Age-related changes in men are described as limited but distinct. The source proposes at least two explanations for reduced semen quality with age, including ordinary disease and genetic change. It associates advanced paternal age with chromosomal abnormalities and increased nondisjunction. It also states that reduced semen volume or quality in older men may not necessarily correspond directly to loss of fertilising capacity. The terminology and claims require modern scientific review.

Pregnancy at an Older Age

Studies are said to show increasing obstetric complications with maternal age. The source reports higher maternal mortality during pregnancy among older women and associates delayed pregnancy with a greater frequency of poor pregnancy outcomes.

It adds that the obstetric risks of pregnancy at an older age may be reduced through advanced medical care and developments in obstetric practice.

Endocrine Changes with Age

Early multiplication of fetal germ cells is stated to produce approximately 6-7 million primordial oocytes between 16 and 20 weeks of gestation, after which the germ-cell pool declines.

Accelerated follicular loss is described as beginning 10-15 years before menopause, when the total follicle count reaches approximately 25,000, reportedly around ages 37-38 in the average woman. This loss is accompanied by a subtle rise in follicle-stimulating hormone and a decline in inhibin.

Hormonal and Ovarian Changes

Printed page 33

These changes include a rise in follicle-stimulating hormone, reflecting the decreasing number and quality of ageing follicles. The subtle biological changes affecting fertility may occur without readily noticeable changes in the pattern or features of the menstrual cycle.

Before menopause, a period of shorter follicular phases and higher follicle-stimulating hormone levels may occur. Menstrual cycles may remain regular for 10-15 years before menopause, while their overall length gradually shortens because of a shorter follicular phase. This shortening may become apparent in the late thirties, when a small but genuine rise in follicle-stimulating hormone and a fall in inhibin occur.

For several years - in some women up to ten years - before menopause, the duration of menstrual cycles may subsequently lengthen again.

Women approaching ovarian or ovulatory failure may have increased follicle-stimulating hormone and reduced inhibin, while ovarian sex-steroid levels remain normal. The late rise in follicle-stimulating hormone is attributed to reduced inhibin production by a diminishing follicular pool.

Follicular-phase inhibin levels are reported to be lower in women aged 45-49 than in younger women. The decline begins earlier but accelerates after age 40. A rise in follicle-stimulating hormone may not become apparent until around age 40, while ovarian sex-steroid levels may remain unchanged until menopause. The source suggests that the best-quality follicles respond earlier in reproductive life, leaving a less favourable pool later, consistent with declining fertility with age.

The Uterus or the Oocytes?

Printed page 34

Is the Age-Related Decline in Fertility Due to the Uterus or the Oocytes?

The source refers to assisted-reproduction experiments showing lower in-vitro pregnancy rates when oocytes are obtained from older women. It then describes comparable pregnancy rates when embryos derived from younger oocytes are transferred to younger and older recipients. The high fertilisation and pregnancy rates reported in older women receiving younger donor oocytes suggest that uterine factors may not be the principal cause of age-related fertility decline. In this interpretation, the biological advantage of younger oocytes can overcome much of any age-related uterine effect. The original wording is difficult, and the study design and conclusion require verification against the cited source.

Causes of Infertility and Ovulatory Disorders

Professor Dr. Taher Abdel Rahim Shaheen

Part Eleven • Arabic and English Review Edition

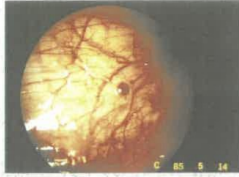
Editorial Note

This part includes a laparoscopic image plate of endometriosis, followed by printed pages 35 and 36 with English translation.

A blank page follows the image plate in the source scan; it has been omitted without loss of content.

Historical terminology and classifications have been retained. Some wording requires author review, including the printed phrase “polycystic oocytes,” probably intended to mean “polycystic ovaries,” and the passage concerning Sheehan syndrome and pituitary tumours.

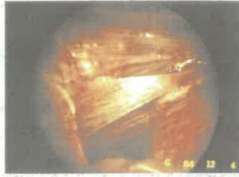
Laparoscopic Endometriosis Plate



منظار يبين إصابة خفيفة مرض الأندومتریوز



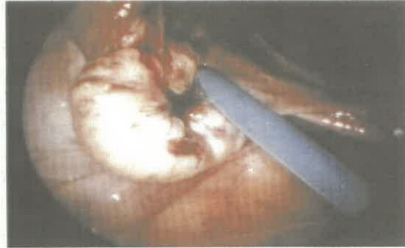
منظار يبين الأندومتریوز مسببا التصاقات في قناة فالوب



التصاقات ما بعد الإصابة بمرض الأندومتریوز



صورة تبين نقطة كبيرة من مرض الأندومتریوز



صورة تبين إصابة عنق الرحم بمرض الأندومتریوز

1. Laparoscopic view showing mild endometriosis.
2. Endometriosis causing adhesions involving the fallopian tube.
3. Adhesions following endometriosis.
4. A large focus of endometriosis.
5. Endometriosis involving the cervix.

Chapter One: Causes of Infertility

Printed page 35

Chapter One

Several factors are considered when assessing infertility in women:

1. Age, occupation, religion and cultural background.
2. The number of years during which pregnancy has been attempted and the history of previous contraceptive use.
3. Previous marriages and pregnancies of either partner.
4. Whether infertility is primary or secondary, including details of complications accompanying previous pregnancies.
5. Sexual history, including frequency of intercourse, dyspareunia, impotence or difficulty with ejaculation, because these may be clinically important.
6. General medical history, including recurrent illnesses or operations, particularly appendicitis in women and previous hernia repair in men, as printed in the source.

Causes of Infertility in Women

General factors shared by both partners may contribute to infertility, including age, medical history, poor nutrition and emotional stress. The source identifies ovulatory disorders, tubal disease and cervical abnormalities as principal causes of female infertility.

1. Ovulatory Disorders

Ovulatory disorders are divided into five categories:

- A. Primary amenorrhoea: failure of menstruation to begin by age 18. The source states that this is rarely considered a feature of secondary infertility and will be discussed separately. The age threshold is historical and requires updating.

Ovulatory Disorders

Printed page 36

B. Secondary amenorrhoea: absence of menstruation for six months or longer in a woman with a previous history of menstruation.

C. Oligomenorrhoea, or widely spaced menstrual periods: cycles occur every six weeks to six months and may or may not be ovulatory. Even when ovulation accompanies the cycle, its infrequency may contribute to failure of conception.

D. Anovulatory cycles: the cycle may appear to be of normal duration, but ovulation does not occur.

E. Ovulation may appear to occur, but the oocyte remains trapped within the follicle; luteal insufficiency may also be present, preventing conception.

Endocrine Causes of Oligomenorrhoea and Secondary Amenorrhoea

Anovulation commonly accompanies amenorrhoea or oligomenorrhoea and may result from changes along the hypothalamic-pituitary-ovarian axis. Menstrual disturbance may accompany stress, rapid weight gain and obesity, or severe loss of appetite and self-starvation.

Pituitary failure, as in Sheehan syndrome, is described as uncommon. The source also refers to pituitary tumours, prolactin secretion and secondary amenorrhoea; the causal wording in this passage requires scientific and editorial review.

Mild thyroid or adrenal disorders may lack obvious clinical features and should therefore be excluded biochemically. Ovulatory failure may also accompany premature menopause and abnormal oocytes. The printed Arabic phrase literally reads "polycystic oocytes," probably intending polycystic ovaries, and associates the condition with hirsutism, obesity and oligomenorrhoea due to anovulation. The discussion continues on the next page.

Tubal, Uterine and Cervical Factors

Professor Dr. Taher Abdel Rahim Shaheen

Part Twelve • Arabic and English Review Edition

Editorial Note

This part covers printed pages 37-40. It completes the discussion of ovulatory disorders, then addresses tubal, uterine and cervical factors and begins the treatment of female infertility.

Historical numbers and terminology are retained as printed and should not be treated as current diagnostic standards or recommendations.

Scientific and source review is required, particularly for the proportion attributed to tubal disease, postcoital sperm counts, terminology concerning cervical mucus and antibodies, and the description of the physician's role.

Anovulation and Tubal Disease

Printed page 37

The preceding discussion attributes the condition to interruption of enzyme pathways involved in the conversion of androstenedione, testosterone and oestrogen, accompanied by increased luteinising hormone and follicle-stimulating hormone. The terminology reflects the source and requires modern review.

Anovulation with Apparently Normal Cycles

A normal menstrual cycle does not necessarily confirm ovulation. The source relates oocyte development to the secretory phase of the endometrium and states that inadequate ovulatory or luteal development may lead to failure of conception or early miscarriage. The condition may be difficult to diagnose, with abnormalities arising during the first half of the cycle and impaired follicular development.

2. Tubal Disease

The fallopian tubes collect the oocyte and transport the gametes and fertilised ovum. The fimbriae bring the tubal opening close to the ovary and help draw in the oocyte. Transport and nourishment of the fertilised ovum depend on muscular movement of the tubal wall, ciliary activity and tubal secretions.

Tubal factors are reported to account for approximately 20% of infertility, although the proportion varies considerably between populations.

Congenital reproductive-tract abnormalities may occur, but inflammation is identified as a major recognised cause of tubal damage.

Inflammation may close the fimbrial end of the tube and lead to fluid accumulation, hydrosalpinx or pyosalpinx.

Acute salpingitis may follow sexually transmitted infection such as gonorrhoea, or other bacterial, fungal or viral infection introduced around surgery. Tubal tuberculosis may occur in women with pulmonary tuberculosis, although the source describes it as a rare cause of secondary infertility. The discussion continues on the next page.

Tubal, Uterine and Cervical Factors

Printed page 38

Infection associated with insertion of an intrauterine contraceptive device, abortion, termination of pregnancy or the puerperium may cause cornual occlusion without obvious change in the remainder of the tube.

Pelvic inflammation associated with appendicitis and peritonitis may produce peritubal adhesions without damaging the tubal mucosa.

Inflammation affecting the tubal lumen may cause loss of cilia and damage or thinning of the inner tubal wall. Thus, even when the tube remains anatomically patent, injury to its wall and lumen may severely impair function and gamete transport. The original wording concerning the inflammatory layer requires review.

3. Lesions of the Uterine Cavity

Abnormalities that distort the uterine cavity may interfere with implantation or pregnancy. The source also discusses fibroids and endometrial or mucosal lesions, although the wording is unclear and requires author review.

Acute intrauterine infection after pregnancy with retained products and curettage may cause complete or partial adhesion of the uterine walls. Intrauterine adhesions producing this condition are described as Asherman syndrome.

Congenital uterine abnormalities are said not usually to prevent conception, but may be associated with recurrent miscarriage.

4. Cervical Factors

After ejaculation in the vagina, semen collects around the cervix and sperm enter the cervical mucus. Around ovulation, cervical epithelial cells produce abundant watery mucus containing long molecular chains and water-filled channels.

Cervical Mucus and Female Infertility

Printed page 39

The molecular structure of periovulatory cervical mucus is described as forming channels that facilitate passage of sperm into the uterine cavity. The source states that sperm enter within two to three minutes of deposition and gives figures of approximately 100,000-200,000 sperm in cervical mucus, remaining at that level for about 24 hours after intercourse. It also refers to about one million sperm reaching the fallopian tube. These figures and parts of the wording require source verification.

Under the influence of progesterone, cervical mucus becomes less favourable to sperm penetration.

Impaired sperm penetration may also be associated with cervical inflammation or antisperm antibodies in cervical mucus or seminal plasma. Abnormal cervical mucus secretion and progestogenic effects are discussed as additional factors; the causal wording requires scientific review.

Female Causes of Infertility

- Disorders of ovulation.
- Failure of gamete interaction or fertilisation, as described in the source.
- Tubal obstruction or impaired ciliary function.
- Congenital or acquired lesions of the uterine cavity.

Treatment of Infertility in Women

Printed page 40

Chapter Two

Treatment of Infertility in Women

1. The Physician's Role

The physician cannot guarantee pregnancy, but may help shorten the time needed to achieve it. Couples in their thirties are encouraged to seek timely assistance when a problem is recognised. The source states that the physician has four principal objectives:

1. Investigate the causes of infertility or subfertility, assess the condition and select appropriate treatment, with the aim of enabling pregnancy where possible.
2. Obtain accurate information and exclude unclear or unreliable information.
3. Provide emotional support during attempts to conceive. Infertility may make couples feel that an important part of married life has been lost. Investigations, including scheduled intercourse, may impose shame, distress and a heavy emotional burden. Couples need an opportunity to discuss concerns, understand risks and treatment, and receive support, including through peer groups.

Group meetings can help individuals address their difficulties, recognise that they are not alone and learn how others have coped with infertility. The source emphasises that ordinary day-to-day stresses and frustrations should not automatically be assumed to be the cause of failure to conceive.

Medical and Surgical Treatment of Infertility

Professor Dr. Taher Abdel Rahim Shaheen

Part Thirteen • Arabic and English Review Edition

Editorial Note

This part covers printed pages 41-44: clomiphene and gonadotrophin therapy, treatment of cervical and uterine factors, and the beginning of treatment for unexplained infertility.

All doses, protocols and outcome figures are historical and must not be used as current treatment instructions without review against modern evidence and guidelines.

Drug and hormone names, success rates, risks of ovarian hyperstimulation and multiple pregnancy, steroid and stent protocols, and intrauterine insemination methods require careful author review.

Drug Therapy: Clomiphene

Printed page 41

4. Some couples wish to know when continued investigations and treatment are no longer appropriate. The source considers this particularly important for the 10-15% of couples in whom no cause is identified. Follow-up and counselling should continue, even when assisted reproduction is not undertaken, with review of investigations, treatment plans and emotional or financial support at least every three months when needed.

2. Drug Treatment of Female Infertility

Ovulatory infertility may be treated medically and, in selected conditions, surgically. The source associates surgical treatment with polycystic ovaries, although its printed description of “accumulated oocytes within the fallopian tube” is medically unclear.

Clomiphene citrate is described as a treatment for impaired ovulation acting on the hypothalamic-pituitary axis.

Clomiphene blocks oestrogen receptors, reduces oestrogen negative feedback and increases gonadotrophin stimulation of ovulation. The source also proposes direct effects on reproductive tissues and reports a response rate approaching 85%; the endpoint and figure require verification.

Adverse Effects of Clomiphene

Flushing, warmth, menstrual disturbance, breast pain and back pain are listed. The source also notes an increased likelihood of multiple pregnancy. Current contraindications, monitoring and risk counselling must be added before publication.

Clomiphene and Gonadotrophins

Printed page 42

Historical Clomiphene Regimen in the Source

The source describes clomiphene tablets at 50 mg daily for five days from the first day of the cycle, with variations extending to day nine, 100 mg daily from days two to six, or 25 mg daily in selected patients. These regimens are reproduced only as historical text and require complete updating.

Ovulation is said to occur 5-10 days after the last dose, with intercourse advised on alternate days for a week beginning around cycle day 14. This fixed timing does not account for individual monitoring and should not be treated as current guidance.

The source states that bromocriptine may be used with clomiphene.

Gonadotrophin Therapy

Gonadotrophins are described for induction of ovulation when clomiphene fails or when gonadotrophin deficiency is present. Historical brand names include Humegon and Pergonal, administered by intramuscular injection and containing FSH and LH activity.

Unlike clomiphene, gonadotrophins act directly on the ovary to stimulate follicular development and oocyte maturation.

The aim is to obtain an appropriate number of mature oocytes available for fertilisation. Modern ultrasound and hormonal monitoring, dose adjustment and safety precautions must be specified in a revised edition.

Cervical and Uterine Factors

Printed page 43

The source discusses oocyte release during ovulation and the risk of excessive ovarian response during gonadotrophin treatment. Rising serum oestradiol and ovarian enlargement are identified as important signs. In modern terminology, this section requires explicit discussion of ovarian hyperstimulation syndrome, ultrasound monitoring and cancellation criteria.

Cervical Factor

Assessment includes cervical anatomy, congenital abnormalities, cervicitis and the quantity and quality of cervical mucus. Abnormal mucus may interfere with sperm transport and gamete interaction.

Where congenital abnormalities cannot be corrected surgically, the source proposes insemination with prepared sperm.

Progesterone and oestrogen balance is said to affect fertility. The source mentions Humegon or FSH alone to improve ovulation and hormonal balance; this wording and indication require review.

Clomiphene is also mentioned in relation to increased oestrogen, but the statement requires clarification.

When antisperm antibodies are present and cannot be treated, insemination is proposed to improve sperm delivery beyond the cervical barrier.

Uterine Factor

Uterine polyps, fibroids or adhesions may require hysteroscopic surgery when they distort the cavity or impair fertility. Surgery may improve the condition but can itself cause intrauterine adhesions; the indication, technique and postoperative assessment should follow modern guidelines.

Uterine Treatment and Unexplained Infertility

Printed page 44

Inflammation of the uterine cavity associated with tuberculosis is described as a cause of infertility and is distinguished from bacterial or viral uterine infection.

After surgery for intrauterine adhesions, the source describes oestrogen treatment at 2.5 mg daily for 2-3 months and, in some cases, a Foley catheter for one week. It reports pregnancy rates approaching 80%. These historical protocols and outcome figures require complete verification and must not be used without current specialist guidance.

3. Treatment of Unexplained Infertility

Management is discussed in relation to spontaneous pregnancy rates among untreated couples with no identified diagnosis. The source notes that pregnancy may occur over subsequent years and recommends careful assessment of the uterus before treatment. Clomiphene and gonadotrophins are proposed to improve conception rates, but contemporary indications require review.

Timed intercourse around ovulation is described, assuming normal sperm count, motility and capacity to penetrate and fertilise the oocyte.

The source then outlines laboratory sperm preparation and insemination or in-vitro handling: semen collection, incubation in nutrient medium, preparation of the oocyte and co-incubation of sperm and oocyte for 16-18 hours. The terminology mixes insemination and laboratory fertilisation steps and therefore requires author clarification and updating to current IVF laboratory standards.

Micromanipulation and In-Vitro Fertilisation

Professor Dr. Taher Abdel Rahim Shaheen

Part Fourteen • Arabic and English Review Edition

Editorial Note

This part includes an illustration of early embryo development and an uncaptured archival operative photograph, followed by printed pages 45 and 46 with English translation.

A blank page follows the image plate in the source scan; it has been omitted without loss of content.

Historical steps, timings and figures are retained. Terminology concerning micromanipulation, IVF steps, embryo division and transfer timing, genetic testing, and passages that mix intrauterine insemination with in-vitro fertilisation require scientific review.

Early Embryo Development

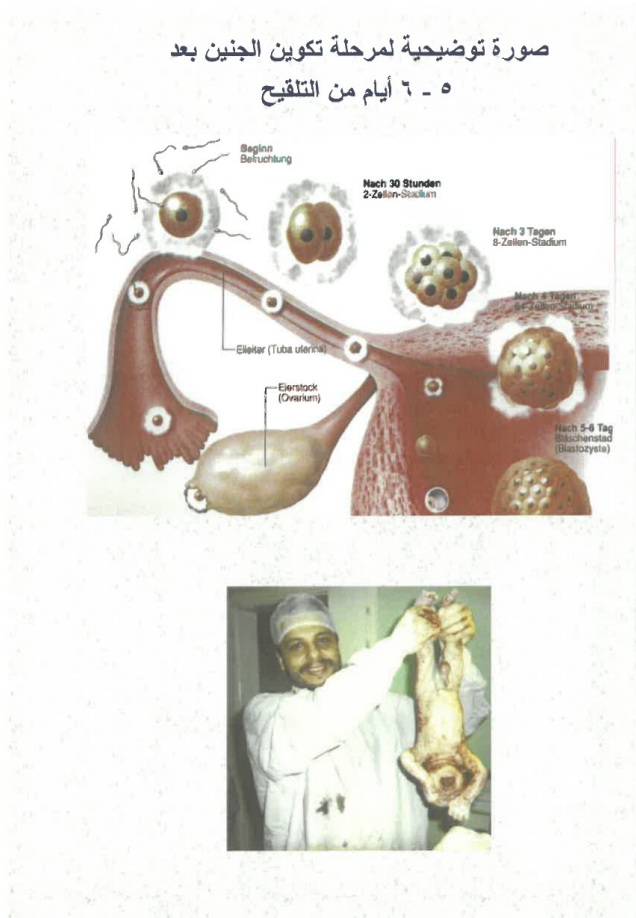


Illustration: early embryo development and transport from the fallopian tube to the uterus, including the two-cell, eight-cell and blastocyst stages.

The printed Arabic heading states “embryo development 5-6 days after fertilisation”; the internal German labels indicate approximately 30 hours, 3 days and 4 days.

Lower image: archival operative photograph reproduced from the source without an original caption. No identity or procedure is inferred.

Micromanipulation

Printed page 45

Micromanipulation

The source describes micromanipulation in relation to several factors in infertile couples, particularly the ability of sperm to penetrate the oocyte. It states that more than one million motile sperm should be present and discusses improving motility, penetration, adhesion and removal of seminal plasma. These criteria are historical and require modern terminology.

Sperm preparation and separation from seminal fluid are presented as important steps before sperm-oocyte interaction. Successful adhesion and penetration are described as increasing the chance of fertilisation and pregnancy.

Female factors include oocyte pickup and transport through the fallopian tube, tubal contractions and the time required for the oocyte or early embryo to reach the uterine cavity, stated as approximately 2-3 days.

The source then gives a difficult and internally inconsistent sequence involving progesterone, the endometrium, cycle day 28, days 5-7, cycle days 10-12 and a 72-hour interval before fertilisation. These timings do not form a coherent modern IVF sequence and require author review against the original references.

Precise timing is emphasised. The source also mentions DNA or protein analysis to detect congenital abnormalities, inherited disease and X-linked conditions. The discussion continues on the next page.

Indications and Historical IVF Steps

Printed page 46

These are presented as major benefits of micromanipulation and genetic analysis. The source also states that pregnancy may be avoided when there is a serious inherited disease that could affect children. Modern preimplantation genetic testing terminology, indications, counselling and legal-ethical requirements must be added.

Indications for Assisted Fertilisation

Success rates decline with increasing age, and age influences the selection and outcome of assisted reproduction. A printed statement concerning kidney inflammation and inability to conceive is unclear and requires verification.

The source mentions analysis of uterine fluid and identifies tubal adhesions, congenital absence of a fallopian tube and severely damaged tubes as indications for assisted fertilisation.

Historical Outline of IVF Steps

1. Gonadotrophin stimulation to induce development of follicles and oocytes.
2. Oocyte maturation under gonadotrophin stimulation.
3. Monitoring oocyte or follicular development by ultrasound.
4. Oocyte retrieval under anaesthesia, described as intravenous or spinal anaesthesia.
5. Transfer of fertilised oocytes after approximately 48 hours, when the zygote or embryo is described as having 4-6 cells; the printed word "layers" is medically imprecise.
6. Hormonal assessment approximately 16 days after fertilisation, as stated in the source.

Transfer of the Zygote or Fertilised Oocyte

The number, selection and transfer of fertilised oocytes or embryos are described as technically difficult. All steps require updating to current IVF laboratory and clinical standards.

Assessment of Ovulation and Tubal Function

Professor Dr. Taher Abdel Rahim Shaheen

Part Fifteen • Arabic and English Review Edition

Editorial Note

This part covers printed pages 47-50: success rates of assisted reproduction, GIFT and ZIFT, assessment of ovulation, and tubal-function testing.

Historical figures, laboratory thresholds and procedural steps are retained and should not be treated as current diagnostic criteria or protocols.

Terminology for gamete and zygote transfer, progesterone and FSH/LH values, timing of biopsy and imaging, and indications for pituitary and tubal assessment require scientific updating.

Success Rates and Female Evaluation

Printed page 47

Maternal Health

The source begins with a passage linking successful ovulation induction and fertilisation to the number of oocytes and sperm. It then describes oral progesterone and oestrogen as a low-cost method of preventing fertilisation during each cycle, referring to the combined oral contraceptive pill. The wording is disconnected from the surrounding infertility discussion and requires author review.

Success Rate

Success varies between patients and depends on diagnosis and maternal age.

The source compares IVF with methods that place gametes or fertilised oocytes in the fallopian tube and notes that ovarian stimulation with gonadotrophins may be required.

In gamete intrafallopian transfer (GIFT), laparoscopy is used to place gametes into the fallopian tube; fertilisation cannot be directly confirmed. In zygote intrafallopian transfer (ZIFT), fertilisation occurs in the laboratory before the zygote is transferred into the tube, historically around 24 hours later. These techniques are presented as historical context.

Evaluation of the Woman

The examination addresses three main questions:

1. Does ovulation occur regularly?
2. Is there damage or impaired tubal function or implantation?
3. Are cervical factors preventing sperm passage?

Assessment of Ovulation

Printed page 48

Assessment of Ovulation

Basal Body Temperature

The source describes a rise of about 0.5°C around ovulation and recommends measuring temperature under the tongue before getting out of bed. A biphasic pattern may support retrospective evidence of ovulation, but some ovulatory cycles show little detectable temperature change.

Cervical Mucus

Near ovulation, cervical mucus becomes abundant, clear, less viscous and highly stretchable. Women may observe these changes themselves. Some experience mid-cycle pain. When dried on a slide, oestrogenised mucus may show a fern pattern that disappears under progesterone influence.

Hormonal Tests

Serial FSH and LH measurement in blood or urine is described as identifying the period around ovulation, with the source referring to approximately 20 hours. Practical limitations are noted.

Daily oestrogen measurement may help estimate follicular maturation but has limited value for precisely timing ovulation. Mid-luteal serum progesterone is described as a useful biochemical test, interpreted according to cycle timing. The source gives a historical threshold of 22.1 nmol/L as evidence of ovulation; current thresholds and timing require verification.

Biopsy, Ultrasound and Laparoscopy

Printed page 49

Endometrial Biopsy and Vaginal Cytology

An endometrial sample may be obtained without anaesthesia or during dilatation and curettage. Secretory endometrial change is described as evidence that ovulation has occurred. The role of biopsy in routine ovulation assessment is historical and requires updating.

Vaginal cytology using the Papanicolaou method is also described for assessing hormonal status. Basal-like, intermediate and superficial cornified cells are distinguished by size and surface characteristics.

Progesterone promotes an intermediate-cell pattern with cell clustering and polymorphonuclear leucocytes.

Ultrasound Examination

Ovarian ultrasound can monitor follicular growth. The source describes a follicle reaching approximately 15-20 mm during the five days before ovulation and changing in appearance after ovulation. Ultrasound is presented as a practical method of cycle monitoring.

Laparoscopic Examination

Direct inspection of the ovary may show signs of ovulation, although it may be difficult to confirm whether follicular rupture has occurred. Routine laparoscopy solely to document ovulation is historical practice.

In summary, several methods provide indirect evidence of ovulation. Basal body temperature and serum progesterone were described as commonly used initial tests, while pregnancy itself is presented as the ultimate evidence of successful ovulation and reproduction.

Anovulation and Tubal Assessment

Printed page 50

Further Investigation of Anovulation

When anovulation is suspected, the source recommends additional tests:

1. Serum prolactin to exclude hyperprolactinaemia and inappropriate milk secretion.
2. FSH and LH in secondary amenorrhoea. Elevated gonadotrophins with low oestrogen suggest ovarian failure.
3. Thyroid-function testing, including TSH.
4. Imaging of the pituitary region when prolactin is elevated or a pituitary mass is suspected. The source mentions skull imaging and computed tomography; modern MRI-based pathways require updating.

Assessment of Tubal Function

Tubal patency and function should be assessed when clinically indicated before prolonged treatment.

Hysterosalpingography

Radiopaque contrast such as the historical agents Diodrast or Urografin is injected into the uterine cavity and fallopian tubes for imaging. The procedure outlines the uterine cavity and may identify tubal obstruction and its location. Current contrast agents, analgesia, infection precautions and indications require revision.

Laparoscopy and Dye Testing

Laparoscopy permits direct inspection of pelvic organs and dye testing of tubal patency. The discussion continues on the next page.

Tubal Tests and Semen Analysis

Professor Dr. Taher Abdel Rahim Shaheen

Part Sixteen • Arabic and English Review Edition

Editorial Note

This part covers printed pages 51-54: completion of tubal and cervical testing, semen analysis, hormonal testing and the beginning of treatment for ovulatory dysfunction.

Reference values, grading systems and doses are retained as historical text and do not represent current WHO standards or treatment protocols.

Postcoital testing, semen volume, concentration, total count, motility and morphology thresholds, interpretation of FSH/LH and testosterone, and clomiphene or tamoxifen doses require complete scientific updating.

Tubal and Cervical Tests

Printed page 51

For greater accuracy, methylene blue dye is injected into the uterine cavity during laparoscopy to demonstrate tubal passage, although the precise site of obstruction cannot always be established.

Gas Insufflation

The source describes insufflation of the tubes with carbon dioxide to assess patency, while noting risks from gas obstruction. It states that this method was replaced by laparoscopy and tubal imaging.

Assessment of the Cervical Factor

Testing aimed to determine whether normal sperm could enter cervical mucus. Several historical tests were developed for this purpose.

Postcoital Test

The couple was instructed to have intercourse and cervical mucus was examined approximately 2-6 hours later, preferably near ovulation. Microscopy assessed the presence and motility of sperm.

Pus cells, sperm agglutination and abnormal sperm were also noted.

In-Vitro Sperm-Mucus Interaction Tests

Capillary-tube and slide tests evaluated the interaction between cervical mucus and the husband's sperm, including penetration, agglutination and abnormal motility.

When agglutination occurred, donor sperm or control mucus could be used historically to distinguish sperm-related from mucus-related effects. These tests have limited roles in modern infertility practice.

Female Evaluation and Semen Analysis

Printed page 52

Summary of the Female Evaluation

- Basal-body-temperature chart.
- LH/FSH surge assessment, described as occurring about 20 hours before ovulation, and serum progesterone around day 21.
- Endometrial smear or biopsy.
- Ultrasound assessment of follicular development.
- Serum prolactin and thyroid-function testing.
- Hysterosalpingography or laparoscopy with dye, and pituitary imaging when indicated.
- Postcoital and sperm-mucus interaction tests.

Male Evaluation

Semen analysis is described as the simplest initial male investigation. The sample is collected by masturbation into a sterile container after two days of abstinence and examined within two hours.

1. Volume: the source states that 80% of fertile men ejaculate 1-4 mL. Low volume is linked to androgen deficiency or accessory-gland dysfunction, although the original wording is unclear.
2. Sperm concentration: azoospermia is associated with male infertility, but the source notes difficulty defining a single lower normal limit. It gives a historical range of 15-20 million sperm/mL.

It also suggests that concentrations above 200 million/mL may cause secondary infertility. This statement is historical and requires verification. Current WHO reference values and repeat-sample requirements must replace these thresholds.

Sperm Count, Motility and Morphology

Printed page 53

3. Total sperm count: the source sometimes substitutes total count for concentration and gives a historical lower acceptable value of 50 million sperm per ejaculate.

4. Motility: sperm movement is important for fertilising capacity. The source states that a normal sample should show good motility in 60% of sperm within one hour and distinguishes progressive from total motility.

The source reproduces a four-grade WHO system: grade 1, rapid forward progression; grade 2, slower or less linear progression; grade 3, non-progressive movement; and grade 4, immotile. Current WHO terminology and reference limits differ and should replace this grading in a revised edition.

5. Morphology: sperm form varies even among fertile men. The source contains an internally problematic statement that more than 80% normal forms would be unusual. White blood cells are discussed as possible evidence of inflammation, with culture recommended when pus cells are present.

The source links abnormal morphology and impaired sperm production or function to toxic exposures, effects on the sperm nucleus and supporting structures, reduced motility and concentration, tight clothing, sexual dysfunction and lipid-lowering drugs. These causal claims require careful modern evidence review.

Hormones and Treatment of Anovulation

Printed page 54

When semen analysis and the postcoital test are normal, the source states that additional male investigations may not yield definite results. With azoospermia or severe oligozoospermia, further assessment is required.

1. Hormone Measurement

A high FSH level suggests significant testicular damage, whereas a low or inappropriately normal gonadotrophin level may indicate hypothalamic-pituitary deficiency. The printed terminology is unclear but appears to describe hypogonadotrophic hypogonadism.

High FSH with azoospermia may support primary spermatogenic failure. LH and testosterone are also discussed. The source associates high LH with low testosterone and mentions Klinefelter syndrome, but this is not the defining hormonal pattern and requires correction.

Treatment of Secondary Infertility or Subfertility

Anovulation

With normal prolactin and appropriate gonadotrophin levels, the source proposes clomiphene or tamoxifen. These anti-oestrogenic agents stimulate pituitary FSH and LH and are reported to induce ovulation in 80% of patients.

A historical clomiphene regimen is given from cycle days 5-9, starting at 50 mg daily and increasing to 200 mg if necessary. This must not be used as current prescribing guidance; modern dosing limits, contraindications and monitoring must be substituted.

Ovulation Induction and Assisted Reproduction

Professor Dr. Taher Abdel Rahim Shaheen

Part Seventeen • Arabic and English Review Edition

Editorial Note

This part covers printed pages 55-58. It discusses monitoring and pharmacological induction of ovulation, tubal surgery and assisted-reproduction techniques, treatment of cervical and male factors, a case study of secondary infertility, and the opening description of ovarian hyperstimulation syndrome.

The regimens, procedures and outcome rates are retained as historical source material. They do not represent current prescribing guidance or contemporary standards of assisted reproduction and require full scientific updating before publication.

Ovulation Induction and Tubal Surgery

Printed page 55

Ovulation Induction and Monitoring

The source states that an ovulatory trigger with human chorionic gonadotrophin (hCG) may sometimes be given around mid-cycle. If oral agents are ineffective, human menopausal gonadotrophin (hMG), historically prepared from the urine of postmenopausal women, or related gonadotrophin preparations may be used.

These drugs must be used cautiously because excessive ovarian stimulation may lead to multiple pregnancy. The source recommends monitoring oestrogen in blood or urine and coordinating hCG administration with the ovarian response.

When anovulation is associated with disordered pituitary secretion, primary pituitary disease should be excluded. In hyperprolactinaemia without a large pituitary lesion, the source describes bromocriptine treatment beginning at 2.5 mg at night and increasing according to the prolactin response.

For hypogonadotrophic states, the text describes gonadotrophin treatment and frequent injections, with close monitoring of follicular development to reduce ovarian hyperstimulation and multiple pregnancy.

Tubal Surgery

The source describes surgery as the principal treatment then available for tubal disease. Although overall success rates were limited, microsurgical techniques improved outcomes. Adhesiolysis around the tubes and correction of the underlying disease are discussed; laser surgery is mentioned as a way of reducing recurrent adhesions.

In-Vitro Fertilisation and Embryo Transfer

Printed page 56

In-vitro fertilisation (IVF) is presented as an alternative treatment for tubal damage. Oocytes were retrieved, fertilised outside the body and the resulting embryos transferred to the uterine cavity.

After ovarian stimulation, oocytes were collected approximately 36 hours after hCG administration. The text describes transvaginal ultrasound-guided retrieval, incubation with sperm, and transfer of embryos at the 4- to 8-cell stage after two to three days.

Related Historical Techniques

Gamete intrafallopian transfer (GIFT) involved immediate transfer of oocytes and sperm into a fallopian tube, generally by laparoscopy. Other techniques described included intrafollicular insemination and transfer of gametes into the peritoneal cavity after oocyte retrieval.

The source gives fertilisation rates of approximately 80-90%, while reporting live-birth rates of about 20% after embryo transfer. These figures are historical, highly dependent on patient and laboratory factors, and must be replaced with contemporary outcome data.

Cervical-Factor Treatment

The text introduces intrauterine insemination with the husband's sperm (AIH) as a possible treatment for a difficult cervical factor.

Cervical Factor and Male Infertility

Printed page 57

The source notes that intrauterine insemination had relatively low success rates and could cause complications, including severe uterine pain. It advises against using it when the postcoital test is normal.

It also describes attempts to reduce contact between semen and cervical mucus and states that assisted reproduction may be required when simpler measures fail.

Treatment of the Male Partner

The text states that specific treatment was possible for only a minority of infertile men. Azoospermia with small testes or high FSH was considered unlikely to respond to treatment.

With normal FSH and normal testicular size, obstruction of the seminal tract was considered. Testicular biopsy and imaging of the vas deferens were proposed, with reconstructive surgery when a correctable blockage was found.

Varicocele ligation is described as sometimes improving semen findings by lowering testicular temperature. For unexplained oligozoospermia, hCG, clomiphene and bromocriptine were used historically, but the text acknowledges variable or limited benefit. Oral androgens were also widely used despite weak evidence of efficacy.

Case Study and Ovarian Hyperstimulation

Printed page 58

Case Study: Secondary Infertility

A couple presented with inability to conceive. The husband had not fathered a child in a previous marriage, worked long hours under substantial physical stress and had infrequent intercourse. His wife had conceived previously but had irregular menses every three to four months.

Semen analysis showed oligozoospermia, while the wife was anovulatory. No obvious abnormality was found on general physical assessment. The couple were advised to modify their lifestyle, and the wife received clomiphene after routine investigations. Pregnancy occurred after three cycles, illustrating that secondary infertility may have several contributing factors.

Micromanipulation for Severe Male Factor

The source lists partial zona dissection (PZD), subzonal insemination (SUZI) and direct injection of sperm into the ooplasm. The last technique corresponds to the principle of intracytoplasmic sperm injection (ICSI). The text reports pregnancy rates comparable with those of conventional IVF.

Ovarian Hyperstimulation Syndrome (OHSS)

OHSS is introduced as a complication of ovulation induction. Severe cases may involve marked ovarian enlargement from multiple cysts and fluid accumulation. The discussion continues on the following printed page.

Ovarian Hyperstimulation Syndrome

Printed page 59 | Continued from page 58

Patients become hypovolaemic and develop hypotension. Renal failure and symptoms of respiratory distress in adults may also occur. The pathophysiology of this condition involves increased vascular permeability, particularly in the ovarian blood vessels.

Prevention

It is important to monitor follicular development and serum oestradiol levels during treatment with human menopausal gonadotrophin (hMG). Low doses of hMG are also important when the response is uncertain. In the event of an excessive ovarian response, or when the serum oestrogen level reaches the value stated in the original text [1], OHSS may be avoided by withholding the hCG injection. hCG administration during the second half of the cycle should also be stopped.

Treatment

If the haematocrit is below the value stated in the original text [2], and the signs and symptoms are mild, the patient may be advised to remain at home. However, when ultrasound examination shows marked ascites, hospital treatment is required. Treatments are given to help prevent worsening complications of this serious condition, and the patient remains under the close observation of the treating medical team. In severe cases, admission to an intensive care unit is required. In most cases, praise be to God, this serious condition can be controlled, provided that the patient is treated by specialised physicians with extensive experience in managing such problems.

And God Most High knows best.

God Most High says: "And you have been given only a little knowledge."

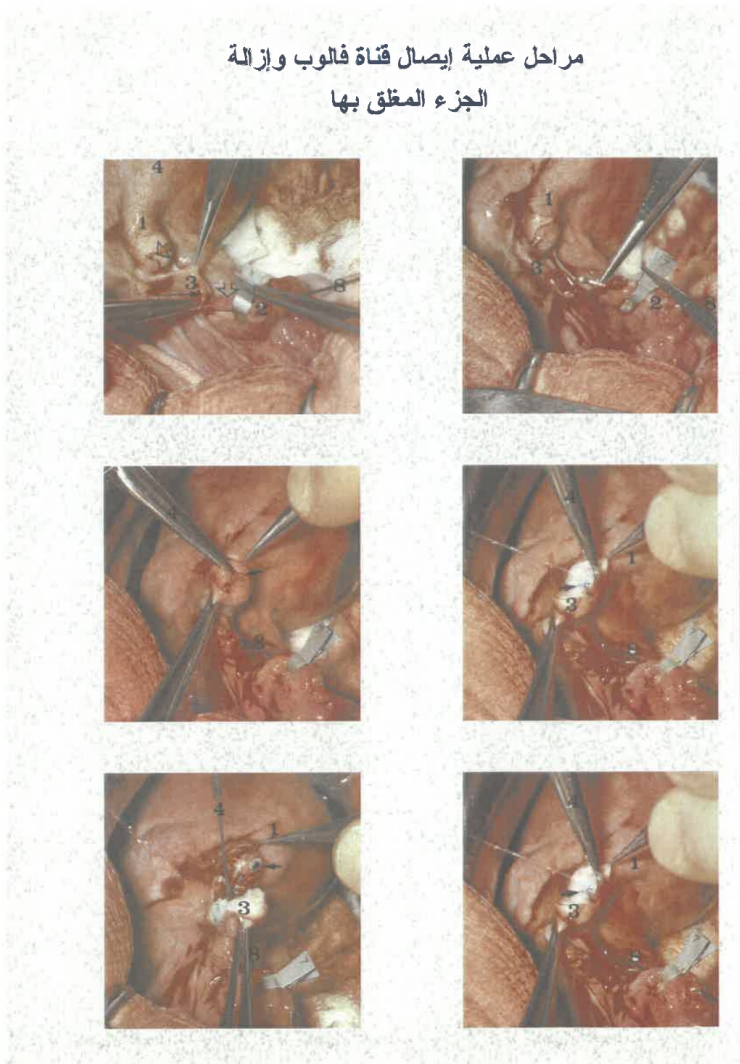
Translator's notes (not part of the original)

[1] The scan appears to show "E 1500 PG" followed by an unclear unit. The exact unit cannot be established confidently. [2] The haematocrit value appears as "455", without a clear decimal point or percentage sign. Neither value has been normalised or presented as a usable clinical threshold.

Fallopian Tube Reconstruction

Translation of the original plate heading

Stages of the operation to reconnect the fallopian tube and remove its blocked segment.

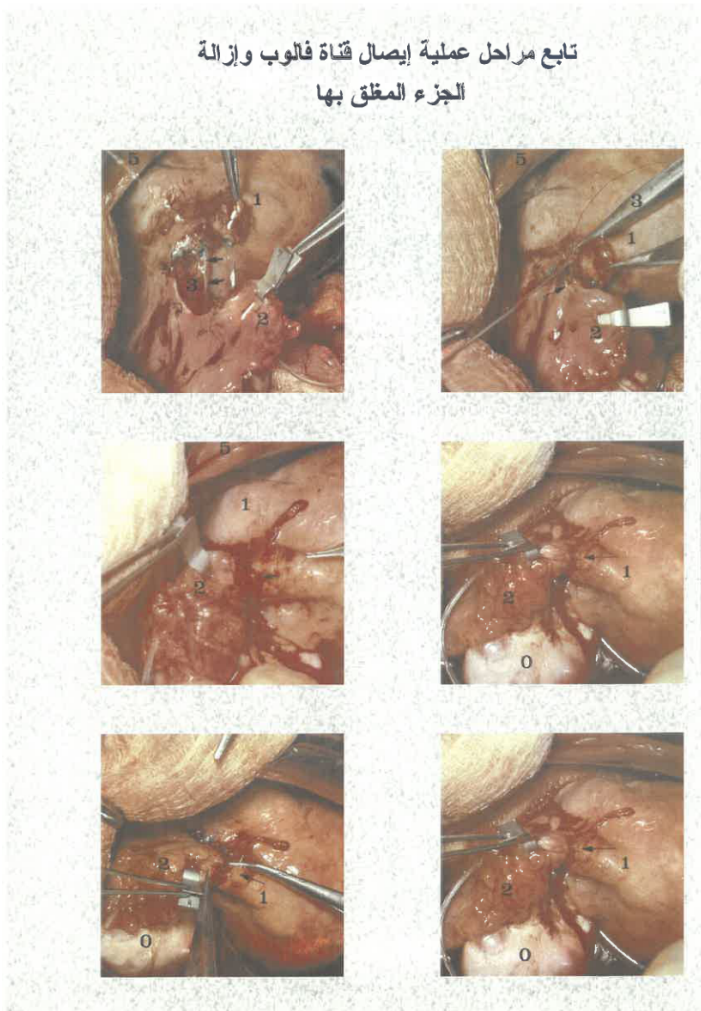


Original six-panel surgical illustration. Numerical labels are retained; the source page provides no explanatory key.

Fallopian Tube Reconstruction

Source PDF page 79 | Unnumbered plate

Continued: stages of the operation to reconnect the fallopian tube and remove its blocked segment.

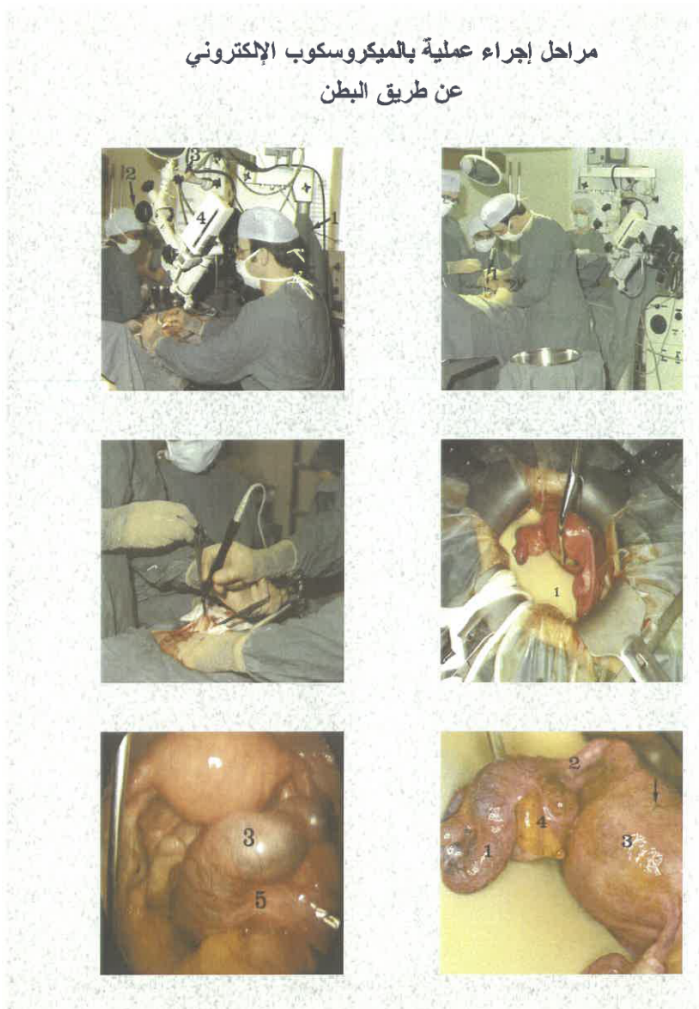


This continues the surgical plate included in Part Eighteen.

Abdominal Surgical Procedure

Source PDF page 81 | Unnumbered plate

Stages of an operation using an electron microscope via an abdominal approach.



Literal heading translation: the source term “electron microscope” requires author clarification; the exact intended instrument is not established here.

Abdominal Surgical Procedure

Source PDF page 83 | Unnumbered plate

Continued: stages of an operation using an electron microscope via an abdominal approach.

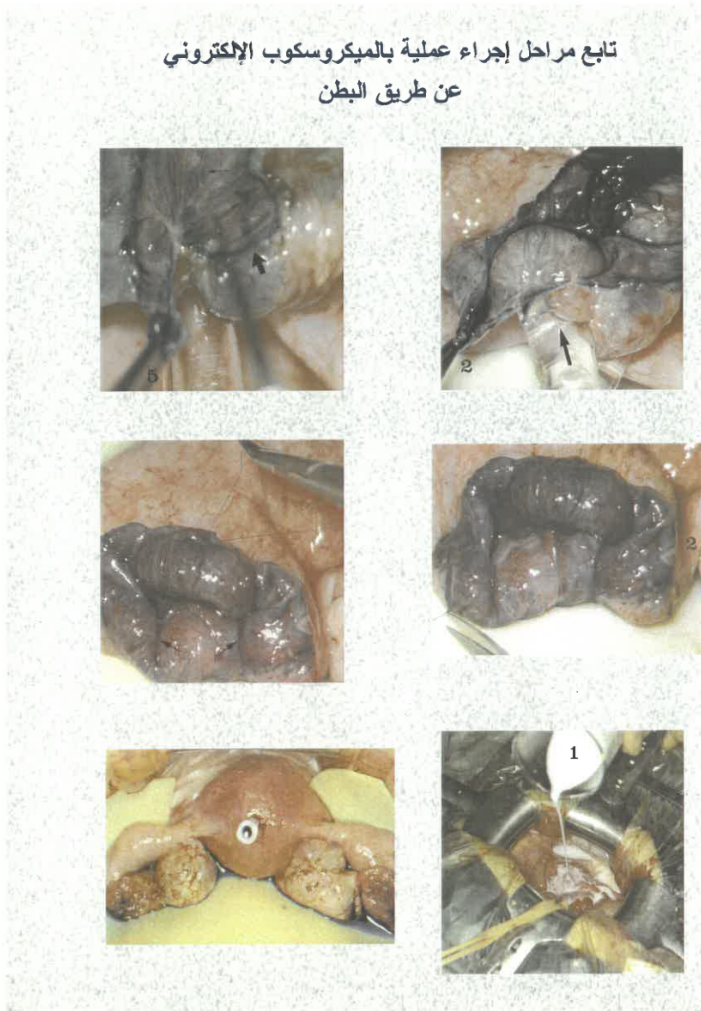


The terminology note for source PDF page 81 also applies here.

Abdominal Surgical Procedure

Source PDF page 85 | Unnumbered plate

Continued: stages of an operation using an electron microscope via an abdominal approach.

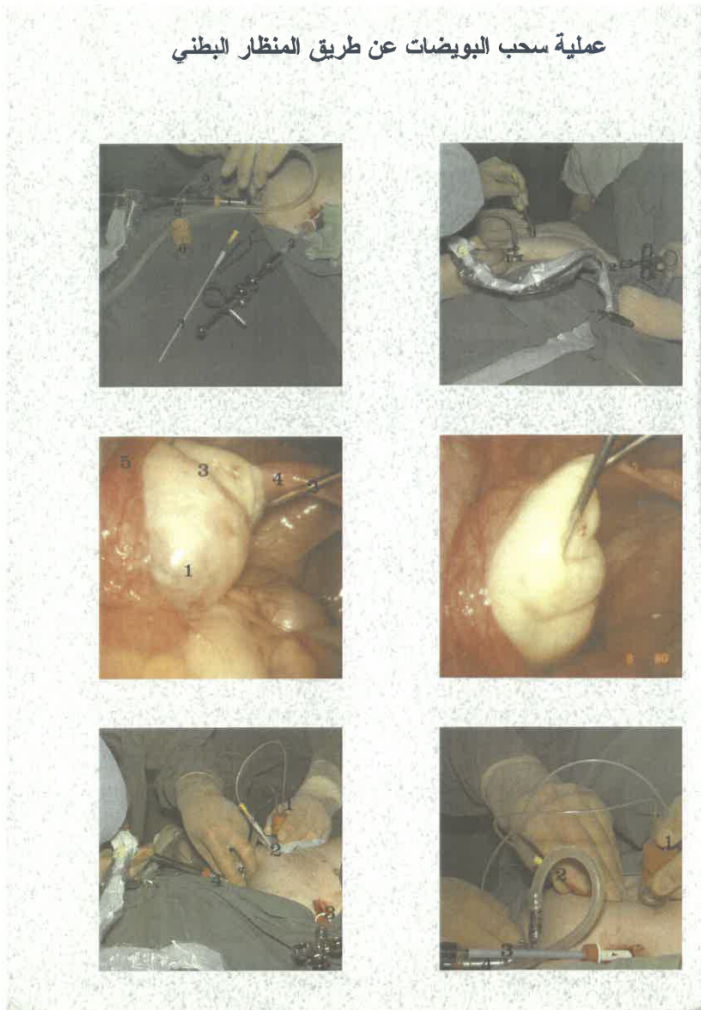


The terminology note for source PDF page 81 also applies here.

Laparoscopic Oocyte Retrieval

Source PDF page 87 | Unnumbered plate

Oocyte retrieval by abdominal laparoscopy.

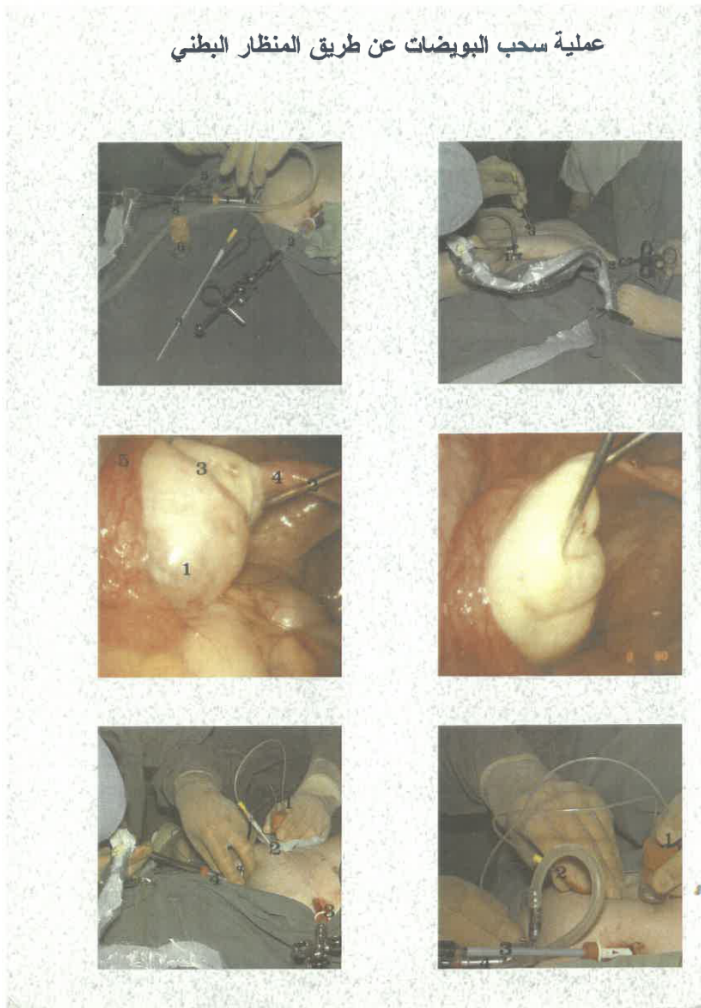


Translation of the original heading. Numerical image labels are preserved without an added key.

Laparoscopic Oocyte Retrieval

Source PDF page 89 | Unnumbered plate

Oocyte retrieval by abdominal laparoscopy.



This plate appears to repeat source PDF page 87. It is retained to preserve the supplied sequence.