Uterine abnormalities and fertility

Understanding uterine abnormalities

The uterus develops from paired embryologic structures called the Mˆ…llerian ducts. During typical development, these ducts elongate, fuse in the midline, and the central partition between them is resorbed to create a single uterine cavity. When any part of this sequence is incomplete, the result may be a congenital uterine anomaly. These conditions are present from birth, although many are not discovered until adolescence, infertility evaluation, miscarriage investigation, or pregnancy imaging.

Congenital uterine anomalies are often grouped by anatomy. A septate uterus has a fibrous or muscular partition dividing the uterine cavity, while the outer contour of the uterus is usually normal or nearly normal. A bicornuate uterus has a deep indentation at the top of the uterus, creating two uterine horns. Uterus didelphys involves near-complete duplication, sometimes with two cervices and a vaginal septum. A unicornuate uterus develops from one Mˆ…llerian duct and is smaller, often with a single uterine horn. Less severe variants include arcuate uterus, which has a mild fundal indentation, and uterine hypoplasia, where the uterus is underdeveloped.

Acquired uterine abnormalities can also matter for fertility. Fibroids,

intrauterine adhesions, endometrial polyps, and adenomyosis may distort the cavity or alter endometrial receptivity. These are different from congenital anomalies, but in fertility practice they are often assessed at the same time because the essential question is similar: can the uterine cavity support implantation and pregnancy safely?

How uterine shape can affect conception and pregnancy

Fertility depends on multiple coordinated events: ovulation, sperm transport, fertilization, embryo development, tubal function, endometrial receptivity, and early placentation. A uterine abnormality may affect one or several of these steps. For example, an altered cavity can make it more difficult for sperm to move efficiently through the reproductive tract, although this is not usually the only factor. More importantly, a distorted or poorly vascularized area of the endometrium may reduce the chance that an embryo implants in an optimal location.

The septate uterus is frequently discussed because the septum may contain tissue with poorer blood supply and less favorable endometrial characteristics. If an embryo implants on the septum, early placental development may be compromised, contributing to miscarriage. Other anomalies, such as bicornuate or unicornuate uterus, may provide a smaller or less evenly shaped cavity, increasing the likelihood of pregnancy loss, fetal growth restriction, malpresentation such as breech position, and preterm birth.

It is important to separate association from certainty. A uterine anomaly can increase risk, but it does not mean pregnancy is impossible. Some individuals discover a uterine difference only after an uncomplicated birth. Others have repeated losses or infertility and only then learn that uterine anatomy may be one part of the picture. Age, ovarian reserve, ovulation regularity, tubal status, sperm parameters, endometriosis, thyroid disease, and other endocrine factors may all influence the overall probability of pregnancy.

Common congenital anomalies seen in fertility care

Different anomalies carry different reproductive implications. Classification systems vary, and the terminology can be confusing even for medically literate patients. The following overview is not a substitute for personal

interpretation of imaging, but it can help frame a clinical conversation.

Septate uterus: The uterine cavity is divided by a septum. This anomaly is often associated with recurrent miscarriage and adverse obstetric outcomes. In selected cases, hysteroscopic septum incision may be discussed.
Bicornuate uterus: The uterus has two upper cavities or horns because of incomplete fusion. Fertility may be normal, but miscarriage, preterm birth, and fetal malpresentation are more common than in a normally shaped uterus.
Uterus didelphys: There are two uterine cavities, often two cervices, and sometimes a longitudinal vaginal septum. Many people can conceive, but pregnancy monitoring is usually attentive to preterm birth and presentation.
Unicornuate uterus: One side of the uterus develops more fully than the other. This may be linked with reduced uterine volume, miscarriage, ectopic pregnancy in a rudimentary horn, preterm birth, and fetal growth issues. Kidney tract anomalies may also coexist, so additional evaluation may be considered.
Arcuate uterus: A mild indentation at the uterine fundus. Its clinical significance is debated, and many clinicians consider it a normal variant or low-risk finding unless other factors are present.
Hypoplastic or small uterus: The uterus is underdeveloped. Reproductive impact depends on the underlying cause, hormonal environment, endometrial function, and overall anatomy.

When to consider evaluation

Uterine anomalies are often silent. Menstrual cycles may be normal, and pelvic exams may not reveal the problem unless there is a vaginal septum, duplicated cervix, or other visible feature. Evaluation may be considered when there is infertility, recurrent miscarriage, a history of second-trimester loss, preterm birth, repeated embryo transfer failure, severe dysmenorrhea with obstructive anatomy, or an incidental finding on ultrasound.

In many fertility workups, the uterus is assessed along with ovulation, ovarian reserve, fallopian tubes, and semen analysis. This is valuable because a uterine anomaly may coexist with other fertility factors. For example, a person may have a septate uterus and also have diminished ovarian reserve, irregular ovulation, or a partner with abnormal sperm parameters. Focusing on the uterus alone can miss important contributors to delayed conception.

If a congenital anomaly is suspected, clinicians may also ask about renal imaging. The reproductive tract and urinary tract develop near each other embryologically, and some Mˆ…llerian anomalies, particularly unicornuate uterus and uterus didelphys, may be associated with kidney or ureter differences. This does not apply to everyone, but it is a reasonable point to discuss with a specialist.

Diagnostic tools: seeing both the cavity and the uterine contour

A key diagnostic challenge is distinguishing between anomalies that look similar from inside the uterine cavity but differ in the external uterine shape. For example, a septate uterus and a bicornuate uterus may both appear to have two spaces internally, but their management can be very different. The septate uterus has a midline partition with a relatively normal outer fundal contour, while a bicornuate uterus has a prominent external fundal cleft.

Two-dimensional transvaginal ultrasound: Often the first imaging test. It can identify many abnormalities but may be limited for complex anatomy.
Three-dimensional transvaginal ultrasound: Particularly useful because it can show the coronal plane of the uterus, helping assess both the cavity and fundal contour.
Saline infusion sonography: Sterile fluid is placed in the uterine cavity during ultrasound to outline the endometrial space and detect septa, polyps, adhesions, or submucosal fibroids.
Hysterosalpingography: An X-ray test using contrast to outline the uterine cavity and fallopian tubes. It can suggest an anomaly but may not reliably define the external contour.
MRI: Helpful for complex cases, suspected associated pelvic anatomy, or when ultrasound findings are unclear.
Hysteroscopy and laparoscopy: Hysteroscopy directly visualizes the uterine cavity; laparoscopy can assess the outside of the uterus. These are procedures, not just imaging tests, and are used selectively.

Because terminology and classification influence treatment decisions, many patients benefit from review by a reproductive endocrinologist or a gynecologic surgeon experienced in congenital uterine anomalies.

Treatment and management: individualized rather than automatic

Not every uterine abnormality needs treatment. Management depends on the specific anatomy, reproductive history, current fertility goals, symptoms, and whether other infertility factors are present. Observation may be entirely reasonable for a person with an incidental finding, no pregnancy losses, and no cavity distortion that is expected to impair implantation.

For a septate uterus, hysteroscopic septum incision or resection may be considered, especially in the context of recurrent miscarriage or poor reproductive outcomes. The procedure is performed through the cervix without an abdominal incision, but it is still surgery and carries potential risks such as bleeding, infection, uterine perforation, intrauterine adhesions, or, rarely, complications in a future pregnancy. Decisions should be made after careful imaging and specialist counseling.

For bicornuate uterus, didelphys uterus, and unicornuate uterus, surgery is far less commonly used and is reserved for selected situations. Many individuals are managed expectantly, with attention to early pregnancy location, cervical length, fetal growth, and preterm birth risk. Assisted reproductive technologies such as in vitro fertilization can help when there are additional fertility factors, but IVF does not necessarily eliminate risks related to uterine shape once pregnancy is established.

Acquired cavity-distorting lesions may have separate management pathways. Submucosal fibroids, significant polyps, or adhesions may be treated surgically in some fertility contexts. However, treatment recommendations depend on size, location, symptoms, ovarian reserve, pregnancy history, and procedural risk.

Pregnancy care after a uterine anomaly is identified

A positive pregnancy test after infertility or pregnancy loss can bring both joy and anxiety. If a uterine anomaly is known, early communication with the obstetric team is helpful. Some patients are referred to maternal-fetal medicine for risk assessment, especially with unicornuate uterus, uterus didelphys, a history of preterm birth, prior second-trimester loss, or complex anatomy.

Monitoring may include early ultrasound to confirm pregnancy location and

viability, assessment of cervical length in selected pregnancies, attention to fetal growth, and planning for fetal presentation near the third trimester. Breech or transverse presentation is more common when the uterine cavity shape limits fetal movement, which may increase the likelihood of cesarean delivery. Preterm labor precautions may also be reviewed.

Emotional care is part of medical care. People with recurrent miscarriage or prolonged infertility often carry understandable fear into pregnancy. Asking for clear surveillance plans, warning signs, and realistic risk estimates can reduce uncertainty. Counseling, peer support, and continuity with a trusted clinical team may make the experience more manageable.

Questions to bring to your clinician

If you have been told you may have a uterine abnormality, it is reasonable to ask for precise language and a plan. Useful questions include:

What type of uterine anomaly is suspected, and how confident are we in the diagnosis?
Do we need imaging that shows both the uterine cavity and the outer uterine contour?
Could this finding explain infertility, miscarriage, preterm birth, or failed embryo transfer in my case?
Are there other fertility factors that should be evaluated before deciding on treatment?
If surgery is an option, what benefits are expected for someone with my history, and what are the risks?
Would pregnancy require maternal-fetal medicine consultation or additional monitoring?

These discussions can be especially important before fertility treatment. Embryo quality, endometrial preparation, uterine cavity shape, and transfer technique all matter, and a thoughtful plan may prevent avoidable delays or procedures.