

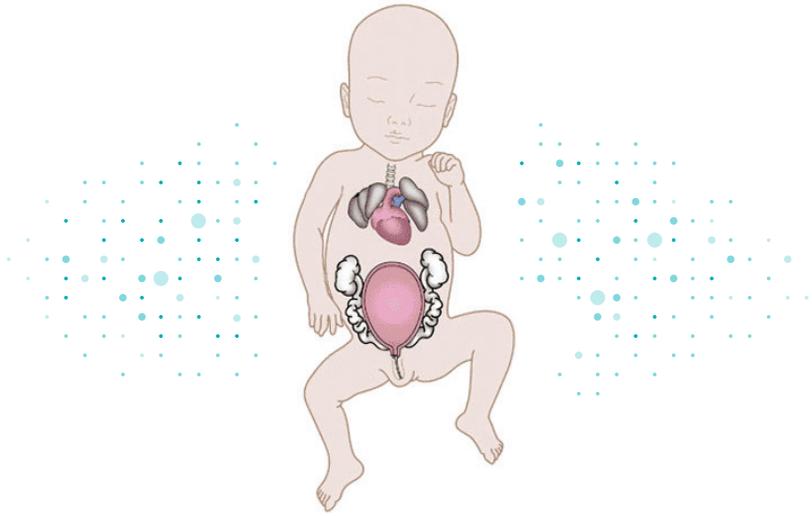


Cincinnati
Fetal Center

Bladder Outlet Obstruction

Comprehensive Diagnosis & Treatment





Bladder Outlet Obstruction

Bladder Outlet Obstruction (BOO) is a blockage at the base of the bladder that reduces or prevents the flow of urine into the urethra. If not corrected, this blockage can cause backup of urine in the bladder, the ureters and kidneys (hydronephrosis) and, in severe cases, a deficiency of amniotic fluid (oligohydramnios), distended bladder and ureters, and dysplastic changes in the kidneys. In most cases, bladder outlet obstruction is a sporadic event. In rare cases, it is associated with a chromosomal abnormality.

Incidence and Prognosis

Bladder outlet obstruction is more common in males than in females. In males, the condition is typically caused by posterior urethral valves (PUV), in which an abnormal fold of tissue in the urethra blocks urine from flowing freely out of the bladder. PUV is a uniquely male condition and accounts for 10 percent of all urologic anomalies detected by prenatal ultrasound. It is estimated, however, that prenatal ultrasound detects only 50 percent of new PUV cases, suggesting that the incidence is approximately 1 in 4,000 live births.

Some patients born with bladder outlet obstruction are asymptomatic, while others have more severe problems including respiratory insufficiency as a result of pulmonary hypoplasia and kidney failure from renal dysplasia. Severe respiratory insufficiency at birth is a leading cause of neonatal death in this condition.

Fetal Diagnosis

Bladder outlet obstruction can be diagnosed via ultrasound, which can provide a detailed examination of the urinary tract and the amniotic fluid volume. Additional tools can help refine the diagnosis. They include:

- Fetal MRI to detect cystic renal changes not apparent on ultrasound and to diagnose associated non-renal abnormalities
- Serial sampling of fetal urine to evaluate renal function
- Chromosomal analysis
- Echocardiography to detect any structural heart disease

Males usually present with a large bladder and evidence of a dilated urethra, indicating PUV. Females can present this way, but often have evidence of other urogenital conditions such as cloacal malformation or megacystis microcolon. It is essential to distinguish between these diagnoses since treatment recommendations vary significantly.

The Initial Visit

Cincinnati Fetal Center provides testing, a definitive diagnosis and a treatment plan, all within 2–3 days. After diagnostic tests have been completed, patients meet with members of our multidisciplinary team, which can include:

- Maternal-fetal medicine specialist
- Pediatric and fetal surgeons
- Pediatric nephrologist
- Pediatric colorectal surgeon
- Pediatric renal transplant surgeon
- Pediatric urologist
- Neonatologist
- Genetics counselor
- Social worker

Cincinnati Fetal Center provides extensive counseling to help patients understand the diagnostic findings, treatment options, long-term prognosis and quality of life issues. Comfort care is an option when parents choose not to intervene.

Referring physicians are welcome to participate in patient conferences via video conferencing.

Fetal Interventions

Surgery is sometimes an option for patients who have received a diagnosis of bladder outlet obstruction. Cincinnati Fetal Center offers three different surgeries, including open fetal surgery for vesicostomy, fetal vesicoamniotic shunting and fetoscopic surgery to release the obstruction. Fetuses most likely to benefit are those whose bladder obstruction is likely hindering kidney and lung development, but has not yet caused irreversible kidney damage.

OPEN FETAL SURGERY FOR VESICOSTOMY

This operation is offered to carefully selected patients with bladder outlet obstruction, severe oligohydramnios and favorable prognostic tests of renal function. Vesicostomy is the most definitive means of decompressing the urinary tract to prevent ongoing injury to the developing kidney. In fetal vesicostomy, the fetal abdomen is opened below the umbilical cord insertion. The bladder is opened and sutured to the fetal skin, allowing for complete urinary diversion.

FETAL VESICOAMNIOTIC SHUNTING

This operation is the most common and involves placing a percutaneous shunt that allows urine to drain from the bladder into the amniotic space. It has the advantage of bypassing the obstruction and providing a good pulmonary outcome, but also carries multiple risks to the fetus particularly. Renal function is not always preserved.



Distended bladder with outlet obstruction



Distended bladder with shunt visible



Distended bladder with outlet obstruction being drained

FETOSCOPIC SURGERY

This operation is sometimes recommended for patients with PUV and oligohydramnios who present prior to 20 weeks gestation with a favorable prognosis based on fetal urine electrolyte and imaging studies. It involves using a fiberoptic endoscope to enter the uterus and then the fetus, using ablation to open PUV defects through small surgical openings. The procedure is a relatively new innovation and is limited to very few patients.

As an adjunct to these therapies, Cincinnati Fetal Center has also offered amnioport infusion in selected cases. This novel therapy involves placing a port to replenish amniotic fluid throughout gestation to support pulmonary development. It is indicated when the fetus has lost the ability to produce adequate urine to maintain normal amniotic fluid volume. Following delivery, dialysis may be offered if indicated until a renal transplant can occur in selected cases.

Expertise and Experience

From 2004 through 2013, physicians at Cincinnati Fetal Center evaluated more than 243 patients for bladder outlet obstruction. Our team offers a comprehensive, interdisciplinary strategy for diagnosing and treating this condition as well as other urogenital abnormalities. Because of our experience and expertise, we can sometimes provide intervention to include those classically excluded from treatment procedures.

Cincinnati Fetal Center

Cincinnati Fetal Center brings together renowned fetal and maternal medicine specialists, leading technologies and a full range of integrated support services from Cincinnati Children's Hospital Medical Center, Good Samaritan Hospital and University of Cincinnati Medical Center to treat high-risk pregnancies due to severe structural abnormalities. We welcome and appreciate patient referrals.



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your referrals, consult requests,
or emergency transfer needs.

fetalcarecenter.org