

# Ureteral obstruction in the cat

## What is the ureter?

The ureter is the tube which drains urine from the kidney to the bladder. The ureter in the cat is a very narrow tube (internal diameter 0.4mm).

## What is likely to be causing the blockage?

In over 90% of cases, the blockage is caused by a urinary stone made of calcium. In a small number of cases, the stone can be made of dried blood or the obstruction is caused by scarring of the wall of the tube caused by a stone being lodged at that site previously. Most cats produce many kidney stones rather than just one stone and these stones can drop into the ureter causing the blockage.

## Why is blockage of urine outflow from the kidney such a big deal?

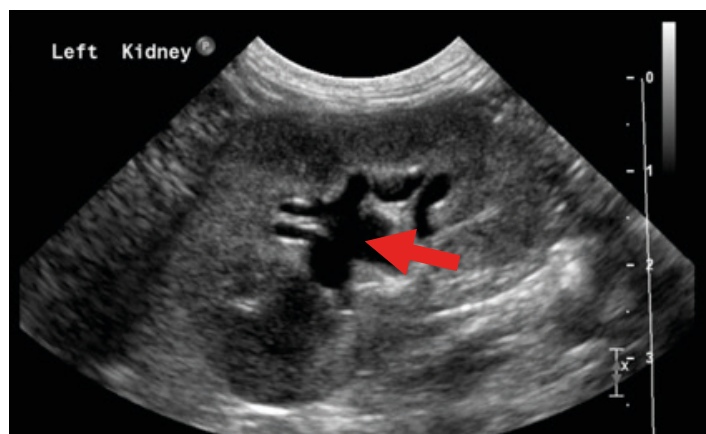
Urine is produced by filtration of the blood and is one of the ways the body eliminates toxins. If the ureter is blocked, urine builds up in the centre of the kidney and eventually this back pressure reduces blood flow to the kidney. The end result of this is permanent damage to the kidney if the obstruction is not relieved. If the outflow to both kidneys is blocked (if either the first kidney is damaged by obstruction and then the second kidney becomes obstructed later down the line or if both become at obstructed at the same time), it is not possible for the body to eliminate toxins and if left untreated, the patient will die.

## How is the problem diagnosed?

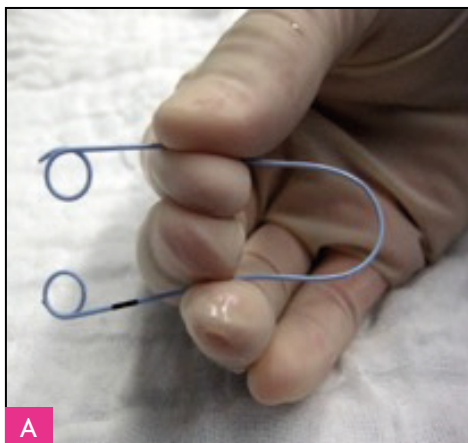
Usually the initial signs are vague; vomiting, lethargy, reduction in appetite and odd behaviour such as hiding away). Blood work shows a marked increase in kidney values and we can also see marked increases in potassium levels which is very dangerous. The definitive diagnosis is made either on x-rays or more commonly on ultrasound where urine can be seen collecting within the kidney (red arrow).

## Options for treatment:

1. **Medical management:** involves use of intravenous fluids to try and flush the stone into the bladder, pain relief and the use of drugs to try and relax the muscle in the wall of the ureter. Unfortunately, due to the small size of the ureter in the cat, this is successful in only about 20% of cases.



2. **Removal of the kidney and ureter:** as we discussed above, it is common that both kidneys are affected. Removal of one kidney is only possible if the other kidney is completely normal. **Main complications:** loss of kidney function, urine leakage into the abdomen, blockage of the remaining kidney/ureter if more stones form in the future.
3. **Removal of the stone from the ureter:** this can be performed in patients with one single stone causing an obstruction. The benefit to this option is that it is not necessary to leave an implant in place which reduces the risk of longer-term complications following surgery. It is a technically challenging procedure requiring use of specialist equipment and as many cats are chronic stone formers, it does not prevent recurrence in the future. **Main complications:** scarring at surgery site causing further obstruction, urine leakage into the abdomen.
4. **Placement of a stent (photo A):** a flexible stent (tube) can be placed from the bladder up the inside of the ureter. The stent has a “pigtail” on each end to help anchor one end on the centre of the kidney and one end in the bladder. Once placed, these stents usually stay in place unless causing an issue. Placement can be technically challenging due to the small size of the ureter. **Main complications:** blockage of the stent, migration of the stent, chronic cystitis-like signs due to irritation caused by the end of the stent in the bladder.
5. **Placement of a bypass device (photo B):** this device consists of a tube which sits in the centre of the kidney and drains the urine to a port which sits outside the muscle of the body wall but under the skin. A second tube connects this port to the bladder thus allowing “bypass” of the normal ureter. The normal ureter is left in place. These devices require life-long monitoring and need flushing via the port every three to six months. **Main complications:** urinary tract infections (up to 25% of cases with 5-10% of devices requiring further surgery), blockage of the device (<10%)



## What is the longer-term future for my cat?

The majority of cats presenting with a ureteral obstruction will usually have sustained damage to one kidney at an earlier date and thus chronic kidney disease and/or kidney failure is common in these patients after surgery and requires ongoing monitoring and diet changes. Some medical studies suggest that patients presenting with very high kidney values before surgery are less likely to survive in the longer term whereas other studies report it is the level of kidney function at three months post-surgery which is predictive of longer-term outcome. Ultimately, kidney function is very likely to have been damaged by the blockage. Average survival for these patients is reported to be over two years. The overall mortality rate associated with this condition is reported to be around 10% of patients.