

# Minimally Invasive Tube Cystostomy Technique for Treatment of Obstructive Urolithiasis in Small Ruminants

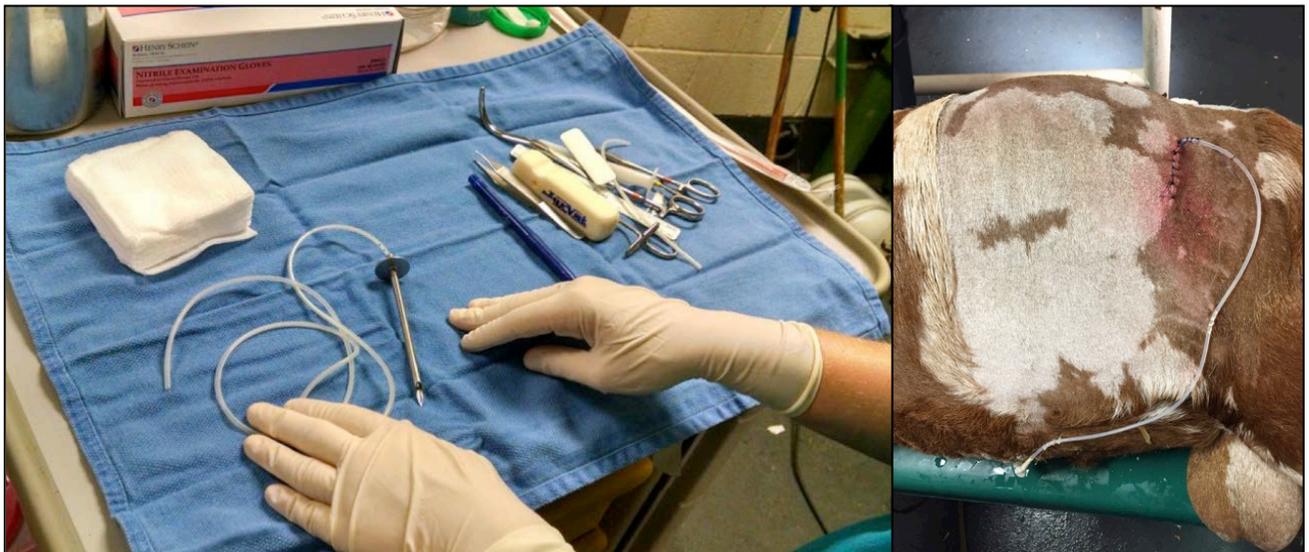
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## Objectives:

- Review common clinical presentation of obstructive urolithiasis in small ruminants.
- Know how to increase the likelihood of success by using physical exam and diagnostic testing to aid in case selection.
- Become familiar with the minimally invasive tube cystostomy procedure.

Obstructive urolithiasis is a common medical emergency in small ruminants. While a variety of medical and surgical treatment options exist, choosing the best one for a given patient can be difficult. An additional complication for veterinarians managing obstructive urolithiasis in livestock species is the expense associated with treatment. Multiple percutaneous catheter and tube placement techniques have been developed to address the issue of cost. These procedures can be done under sedation and local blocks, but often require an expensive follow-up surgical procedure when the catheter becomes clogged or dislodged from the urinary bladder.

A 2010 publication by Fazili et al in *Veterinary Record* describes a minimally invasive surgical tube cystostomy technique for treating obstructive urolithiasis in small ruminants with an intact urinary bladder. The authors describe using a metal cannula poked into the bladder through a left flank “keyhole” incision to insert a length of Jackson Pratt drain through the body wall and into the bladder. The drain is sutured to the skin and left in place to drip until urethral patency can be restored. This procedure was done in field conditions with an average surgical time of less than 10 minutes. The metallic cannula was manufactured by one of the authors and is not commercially available.



*Figure 1 Rumen trocar and drain used to replicate the minimally invasive technique described by Fazili. The left flank of a goat showing the drain exiting the incision and secured to the skin.*

A modification to this technique that has shown good success so far has been to use a human **14FR Suprapubic Foley Catheter Introducer kit** (Utah Medical Product, Inc.) in place of the metal cannula and drain. The benefits include the commercially available, sterile catheter introducer and the larger diameter lumen foley catheter with a balloon. The sheep or goat is sedated and given a local block using either a lumbosacral epidural or local infusion of 2% lidocaine. With the animal in right lateral recumbency, the left paralumbar fossa is surgically prepped. The same left flank keyhole incision is made, and the introducer is poked into the *intact and distended* urinary bladder. An indicator on the introducer allows the clinician to verify the presence of urine before withdrawing the stylet. A silicone foley catheter can then be quickly threaded down the introducer. The foley balloon is inflated with 30 cc sterile saline, and the introducer withdrawn. The incision is closed around the foley catheter and the foley secured to the skin using a finger trap suture. The catheter introducers can be purchased individually or in kits containing the introducer, a silicone foley catheter, and a small package of surgical supplies.



Figure 2 Human Supra-foley kit used for modified minimally invasive tube cystostomy technique. A goat flank shows the foley catheter exiting the keyhole incision.

This procedure is fast, relatively inexpensive, and technically easy. Because it can be done under sedation and requires minimal special supplies, it is ideal for field situations and cases with budget constraints. However, there are a few critically important case selection considerations one must keep in mind before choosing this procedure for a small ruminant patient.

- 1) The urinary bladder must be intact and distended. This is because the urinary bladder must be identified blindly via palpation with a fingertip placed through the keyhole incision. If the bladder is distended, it is easy to feel this water balloon-like structure in the caudal abdomen and guide the sharp catheter introducer to the correct location for a quick, sharp jab. However, if the urinary bladder is flaccid or has ruptured, it cannot be

easily identified or punctured using the catheter introducer through such a small incision.

- 2) This procedure will allow for temporary urine egress while urethral patency is restored through additional medical or surgical intervention. Therefore, it is critically important to consider the cause and location of urinary obstruction. If urethral patency is unlikely to be restored, this procedure will not provide a permanent solution. For this reason, it is ideal to know what type of urinary calculi one is dealing with, as well as the location and number of uroliths within the urinary tract. Calculi that do not dissolve with urine acidification and compromise to the urethra (rupture, severe stricture, diverticulum, etc.) are examples of potentially incompatible with successful implementation of this procedure.
- 3) Patient aftercare is critically important and requires special housing and monitoring from the owner. The patient should be isolated from other animals in a small pen and fitted with an E-collar to prevent them from chewing or removing the foley catheter. The Foley should be monitored at least twice daily for continuous wetness and dripping. Should it become clogged or dislodged, the patient's urinary bladder will quickly become distended and require veterinary attention. The patient must also be monitored for return of normal urination. Once the patient can urinate normally, the foley should be plugged for 24-48 hours with the patient showing no signs of straining or discomfort before being removed.