

## INTRODUCTION TO CLOACOSCOPY IN SNAKES

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The use of rigid endoscopy in reptiles is well documented and has proven to be a useful diagnostic tool in clinical practice.<sup>3,5</sup>

Reports have stressed the value of endoscopy for assessment of the respiratory tract, coelom and upper gastrointestinal tract in reptiles. However there are only two reports in the literature describing cloacoscopy in reptiles.<sup>1,6</sup>

As with the avian patient the reptile cloaca is difficult to evaluate. The anatomy of the cloaca is still poorly defined for many of the 7,000 plus reptile species.

This paper describes the use of rigid endoscopy in conjunction with saline infusion as an effective technique to allow a thorough and noninvasive examination of the cloaca in the snake patient. The technique described in this paper is based on the saline infusion technique described for birds by Taylor and Murray.<sup>7,8</sup>

### SNAKE CLOACAL ANATOMY

The basic cloacal anatomy of reptiles has been reviewed in more detail elsewhere.<sup>2,4</sup> For the endoscopist, some basic review of the cloacal anatomy is important.

The reptile cloaca is divided into three basic divisions. Compared to other reptiles the cloacal divisions in snakes are simple, with minimal to no separation and often poor delineation between the divisions of cloaca.

The cranialmost division is the coprodeum, which is associated with the terminal colon and rectum. The coprodeum is the largest cloacal division in snakes.

The middle division is the urodeum which is associated with the genitourinary systems. In snakes, the urinary tract and the reproductive tracts terminate in the craniodorsal portion of the urodeum. Snakes have no urinary bladder, however, in reptiles with a bladder the urethra communicates with this division.

The caudalmost division is the proctodeum which is associated with the vent. The mucosa of the proctodeum may have active glandular tissue.

Material leaving the cloaca passes through the vent and musk/scent glands empty into the caudal vent. The hemipenes of snakes are located in the base of the tail and when in use evert through the vent.

### CLOACOSCOPY TECHNIQUE

Cloacoscopy is a useful diagnostic tool to evaluate cloacal pathology associated with certain clinical presentations in snake patients including hematochezia, tenesmus, prolapse, dystocia, and constipation.<sup>6</sup>

A 2.7 mm rigid endoscope with a 14.5-Fr instrumented sheath system containing multiple ports (Karl Storz Veterinary Endoscopy America, Inc.) is used

to evaluate the cloaca. A bag of warm sterile fluid (e.g., 0.9% NaCl) with a micro drip administration set is hung above the surgery table for infusion. The drip line is attached to the infusion port of the sheath so that a continuous warm saline drip is delivered through the port system of the sheath to keep the cloaca dilated.<sup>7,8</sup>

The snake patient is anesthetized for the procedure and is placed in either ventral or dorsal recumbency, based on preference of the endoscopist.

The endoscope is gently placed into the cloaca through the lips of the vent and the fluid drip is turned on to initiate fluid distention of the cloaca. The lips of the vent may initially be gently held closed to allow distention of the cloaca. Once the cloaca is dilated, a thorough investigation of the cloacal anatomy can be performed. The distal colon and rectum as well as the coprodeum can be evaluated. The urodeum and associated structures can also be thoroughly examined, including the active oviducts of females and ureteral openings. Finally the proctodeum and the vent may be examined.<sup>6</sup>

The instrument channel of the sheath allows for biopsy of lesions found in the cloaca. The use of the video camera provides documentation of the cloacal anatomy and pathology, which provides a baseline for future evaluation of the therapeutic management. Additionally, the ability to manipulate tissues with the use of this technique is an aid to therapeutic management. Endosurgical procedures utilizing radio surgery (4.0-MHz, Ellman International, Inc.) or diode laser (Accuvet) modalities can be utilized via the sheath system.<sup>6</sup> Additionally visually guided conventional surgery (e.g., colopexy), egg removal in cases of dystocia, and visually guided enemas have all been effectively accomplished in snake patients using this technique.<sup>6</sup>

The clinician must use certain precautions during the cloacoscopy procedure. The snake patient should not be overhydrated during the examination, and the endoscope and instrumentation should be gently manipulated to avoid trauma to the fragile cloacal tissue.

The use of rigid endoscopy in conjunction with saline infusion to evaluate, document, diagnose and treat diseases associated with the snake cloaca is an invaluable asset to the reptile clinician.

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