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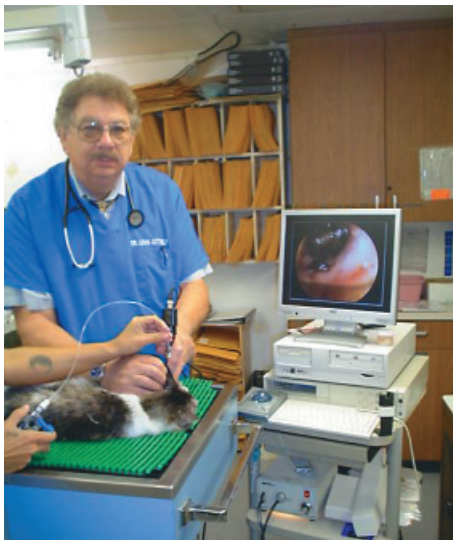
Video Otoscopy

Examination, diagnosis, and treatment of ear disease are drastically improved with use of video otoscopy. When ear disease is encountered during physical examination, the owner and veterinarian can immediately see the problem since the ear canal is magnified clearly on a video monitor.

The MedRx Video Vetscope (www.medrx-usa.com) and the Storz Otoendoscope (www.karlstorz.com) are the 2 systems commonly available. The otoscope is built as a tapered stainless steel probe with an end diameter of 4.75 mm. Within the tapered stainless steel case is a lens system designed to provide 25× to 30× magnification.

Built into the otoscope probe is a hollow 2-mm diameter working channel that allows instrument access. Fiberoptic light fibers from a light source located away from the probe provide 100 watts of cool, concentrated light. The video otoscope light and lens are located at the end of the probe, enhancing illumination of the target tissue and overall image quality.

The otoscope probe is attached to a very sensitive miniature video camera, which sends the highly magnified image to a video display monitor. Depending on the configuration of the video appliances, the video signal can be sent to a video printer, a videotape recorder, a computer, or a digital storage unit before it reaches the video monitor.



Dr. Gotthelf prepares to flush out wax plugs from an anesthetized cat.

Indications

Some common uses for video otoscopy include otic examination; cleaning of the external ear canal; myringotomy to access the bulla; and middle ear flushing, suctioning, and medicating.

Otic Examination & Cleaning

With the video otoscope positioned in the ear canal, a thorough examination can be made from the vertical canal to the horizontal canal, and the eardrum can be evaluated. If the ear canal needs cleaning, a 5-Fr polypropylene or red rubber catheter connected to a flush and suction device, such as the Storz Vetpump 2 or the MedRx EarIGator, can be advanced to flush and suction the canal under video visualization. Large pieces of debris and concretions can be extracted from the ear canal by using a curette or grasping type of endoscopic forceps inserted through the 2-mm working channel.

Myringotomy & Middle Ear Care

In suspected cases of otitis media with the eardrum intact, myringotomy may be performed by advancing a 3½-Fr or 5-Fr polypropylene male urinary catheter (cut at a 45° angle) through the eardrum. Once the catheter reaches the bulla, cytology and/or bacterial culture samples can be retrieved. The bulla is then flushed out using warm water or saline under high pressure to remove mucus, pus, wax, blood clots,

continues

and other material. Such material can be removed quite easily without the need for an assistant to manipulate a suction syringe. Once this is completed, the bulla is suctioned, dried, and infused with aqueous medication. The entire process is observed on the video monitor and side effects from bulla flushing are rarely noted except in some cats, which may have mild self-limited Horner's signs after the procedure.

In an animal with a ruptured eardrum, the bulla can safely be flushed and examined. In these cases, there is often granulation tissue or thickening of the mucoperiosteum, with contamination from the external ear canal resulting in less meaningful culture results.

Advantages

The superior optics of a video otoscope open up the dark world of otoscopy, exponentially improving patient care and owner compliance. More conditions can be diagnosed and more procedures can be performed to treat the ear.

The working channel of some video otoscopes can accommodate a rigid or flexible laser waveguide, allowing laser surgical procedures to be performed (and viewed on the monitor) within the ear canal. Small tumors and stenosis can be addressed and myringotomy performed using the laser through the video otoscope.

The video otoscope also has documentation capability. Any image can be printed out as a 4" × 5"color glossy photograph. In addition, a digital storage unit connected to the video output of the camera allows images to be stored as individual pictures (JPEG format) or as short video clips (WMV or MPG files) on the computer's hard drive or on a removable computer device such as a flash drive or CD.

Under a veterinarian's supervision, technicians can be trained to use the equipment to properly flush and suction the ear prior to examination. Other organ systems, such as the distal nose, oral cavity, and vaginal vault can be examined and treated with the video otoscope when it is used as a rigid endoscope. Both the Storz and MedRx otoscopes are steam autoclavable and can be used as abdominal rigid endoscopes.

To appropriately assess the abdomen, specific equipment should be used. With some video otoscopes, once you have purchased the unit (camera, light source, monitor) you can also purchase additional endoscopes (rigid or flexible) to use for other applications (abdomen, urinary bladder, etc).

Disadvantages

The only disadvantage to using a video otoscope is that the glass lens may fog up when the ear is warm and moist. This disadvantage can be overcome by using a small amount of alcohol or a defogger (UltraStop, www.karlstorz.com) on the lens prior to insertion.

Antarctica Photo Contest Runners-Up

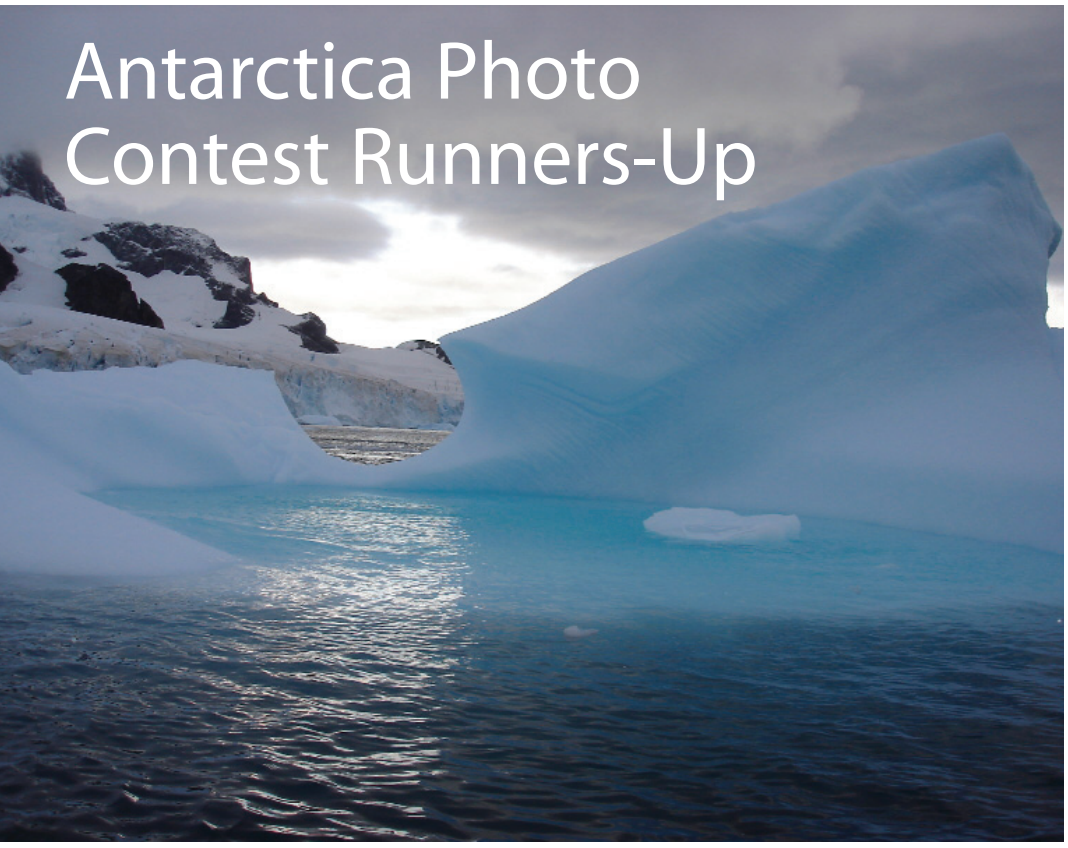


Photo by Anne Terry, DVM

Photo by Paul Currie, DVM

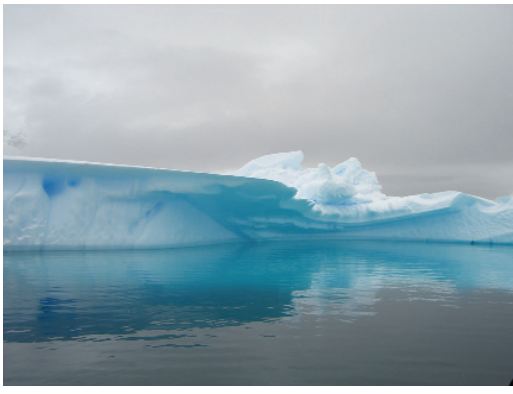


Photo by Dominic Cacioppo, DVM

Economic Impact

A video otoscope is an investment with a very high rate of return. Because of its versatility, it can be used several times a day in an average practice. Video otoscopes range from $7000 to $18,000, depending on the add-ons offered with the system.

Income is generated by charging for video otoscope use, by increasing fees for each procedure done, and through increased numbers and types of procedures performed. When procedures are performed, the use of the video otoscope can be invoiced at $10 to $20 in addition to the cost of the actual procedure. Since ear disease is usually associated with skin disease, increases in revenue are also generated from increased dermatologic diagnostics and therapeutics. Many of the veterinarians in the U.S. with video otoscopy in their hospitals pay for their equipment within the first year.

Dr. Gotthelf discloses that he assisted in the design of the MedRx Video Vetscope, a video-based otoscope.

See Aids & Resources, back page, for references, contacts, and appendices. Article archived on www.cliniciansbrief.com

Photo by Dianne Massiello

Photo by Rick Beldegreen, DVM