

Video Telescope Operating Microscopy

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KEYWORDS

• Endoscopy • VITOM • Operating microscopy • Magnification • Microsurgery

KEY POINTS

- Focused illumination and magnification are requisites for successful microsurgery, which is frequently required for exotic pet surgery.
- Existing endoscopy equipment can be used with a mechanical arm to create an operating microscopy system.
- Veterinarians with existing endoscopy light source and camera equipment should consider the video telescopic operating microscope system as a viable alternative to traditional magnification systems.

INTRODUCTION

According to a 2007 US pet census, there are around 106 million exotic pets in the United States, compared with around 150 million dogs and cats.¹ Of particular interest is that, while the dog and cat population has only grown by 13% since 2001, the exotic pet population has increased by more than 30% during the same period. Most of these exotic species are psittacines, passerines, turtles, snakes, lizards, ferrets, rabbits, rodents, and fish, and owners have come to expect a comparable level of medicine and surgery for these animals as they do for domesticated species. High owner expectations coupled with the fact that most exotic pets weigh less than 2 kg means that the exotic animal surgeon has to face 2 major obstacles:

1. A huge diversity in taxa-specific anatomy, physiology, and disease
2. A heavy reliance on magnification for adequate surgical visualization and microsurgical techniques.

The author has nothing to disclose.

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This need for excellent visualization using a focused light source and magnification has been well documented in many exotic animal texts and has in-part fueled recent developments in minimally invasive endoscopic and endosurgical techniques.²⁻⁵ Nevertheless, we are far from being able to perform all procedures endoscopically, and therefore, the need for traditional, open surgical techniques in small exotic species remains of paramount importance.

ILLUMINATION AND MAGNIFICATION: VIDEO TELESCOPIC OPERATING MICROSCOPE

Traditionally, adequate surgical lighting has been achieved by the use of large, focused overhead light units. Although magnification can be achieved using operating microscopes, their expense and reduced maneuverability have made them less favored by most exotic animal practitioners. Instead, headband or frame-mounted operating loupes with a dedicated light source have gained popularity because they are more affordable, versatile, and simpler to operate.

The recent development of a video telescopic operating microscope (VITOM-25; Karl Storz Veterinary Endoscopy America Inc, Goleta, CA, USA) has provided another option for delivering high-quality focused illumination and magnification. The VITOM uses existing endoscopy equipment, specifically, the light source, camera, and documentation hardware that is commonly used in practice in order to perform extracorporeal visualization of surgical procedures.

The VITOM 25 system is composed of a 11-cm 0° rod-lens telescope that is held 25 to 60 cm above the surgical site by means of a mechanical arm that clamps to the operating table (**Fig. 1**). The system provides a depth of field of 2 to 6 cm and a range of fields of view and magnifications dependent on distance from the surgical site (**Table 1**). The articulated, mechanical arm has a single lock mechanism that controls all 5 joint functions, thereby facilitating easy, rapid positioning. A metal clamp holds the telescope and light guide cable in place. Illumination is controlled at the light source, while the surgeon controls zoom, focus, white balance, and photo/video documentation from the camera. It is noteworthy that the mechanical holding arm can hold any telescope, including the 2.7-mm, and can replace a surgical assistant when performing endoscope-assisted or endosurgery. The VITOM system is autoclavable and typically sterilized before placement and positioning by sterile surgical

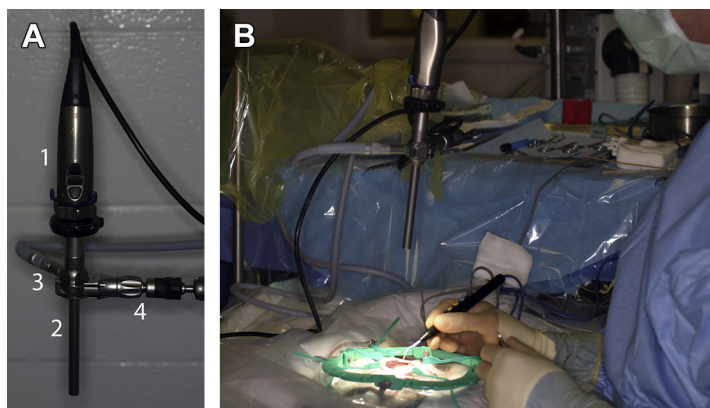


Fig. 1. (A) Endoscopy camera (1), VITOM telescope (2), and light guide cable (3), held in place using the clamp and articulated arm (4). (B) Intraoperative view of the VITOM system positioned above the surgical site.

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