Evaluation of an Endoscope With an Ultra-Wide Field of View
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Abstract

Objective: To establish if an advantage exists using the C-View™ endoscope compared to a conventional 0-degree Hopkins rod-lens telescope.

Methods: A comparison study was performed using a cadaveric sheet glottis and trachea.

Results: The C-View™ endoscope offers a sizable increase in field of view.

Conclusion: The C-View™ technology has potential in the field of diagnostic endoscopy but cannot be further assessed without improvements in its current technology.

Introduction

The objective of this project is to establish if an advantage exists in using the C-View™ endoscope compared to a typical 0-degree Hopkins rod-lens telescope. The C-View™ endoscope is a novel design that provides a field of view up to ±135-degrees about the optical axis and 360-degrees panoramically (Figure 1).

Methods and Materials

A cadaveric sheep glottis and trachea (Figure 2) was examined using both a 4-mm Hopkins rod-lens telescope and a C-View™ endoscope (under development by InterScience, Inc., Troy, NY). At this time, the C-View™ endoscope prototype performs optical imaging only and does not include a means of internal illumination. Therefore, a separate external illumination source was used. Video during these examinations was analyzed and still images were obtained using the video editing software included with our stroboscopy tower (KayPentax Model 9295, Lincoln Park, NJ).

Results

The C-View™-based endoscope offers a sizable increase in field of view. Mucosal findings on the tracheal wall that disappeared into the periphery with the standard 0-degree model were apparent using this endoscope (Figure 3). In addition, we were able to visualize the undersurface of the true vocal folds in such a way impossible with the other endoscope (Figure 4).

Conclusions

The C-View™ endoscope has enormous potential in the field of diagnostic endoscopy by creating a new working environment with an unmatched ultra-wide field of view. At this point, its use in living models or patients cannot be assessed without further development of the endoscope’s illumination subsystem.

The true potential of this endoscopic system may not be fully realized until a prototype is developed which includes adequate illumination models or patients cannot be assessed without further development of the endoscopic environment. The C-View™ technology has potential clinical relevance in many areas, including sinus endoscopy, laryngoscopy/tracheoscopy, esophagoscopy, and skull base surgery. Future studies will assess manipulation of instruments in this new environment.

References