

Poster presentation

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Comparison of laser resistant tracheal tubes subjected to CO₂ laser beam

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from 1st Scientific Meeting of the Head and Neck Optical Diagnostics Society
London, UK. 14 March 2009

Published: 28 July 2009

Head & Neck Oncology 2009, 1(Suppl 1):P21 doi:10.1186/1758-3284-1-S1-P21

This abstract is available from: <http://www.headandneckoncology.org/content/1/S1/P21>

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Introduction

This study was designed to compare how robust four different laser resistant endotracheal tubes would be when subjected to CO₂ laser beam.

Materials and methods

The laser was directed perpendicularly onto the shaft; 'saline-filled cuffs and tips of the tubes. A gas flow of 6 L/min of oxygen was delivered to each tube. The laser was set on continuous mode with power set at 6, 12, and 25 W. The time until tube penetration under microscopic vision was noted. Four different products were studied, all marketed as laser resistant:

1. Xomed laser-shield® II endotracheal tube: aluminium wrapped shaft with an unprotected fluoroelastomer cuff and tip.
2. Sheridan laser-trach® tracheal tube: copper wrapped shaft with an unprotected red rubber cuff and tip.
3. Mallinckrodt laser-flex™ tracheal tube: stainless steel shaft with an unprotected plastic cuff and tip.
4. Norton tube: entirely metal with no cuff.

Results

The Norton tube was the only entirely laser resistant tube, surviving greater than 5 minutes lasering at 25 Watts. The shafts of the other three tubes were also laser resistant.

However the unprotected cuffs and tips of these three tubes were all penetrated within two seconds, even at minimum power, frequently exhibiting flaring.

Conclusion

Airway fires are possible with laser resistant tubes. The risk of a fire increases with increasing power and duration of the laser beam on the tube. This study demonstrates the ease of penetration of the unshielded components of these laser tubes.