
High-power laser vaporization of the canine prostate using a 110 W Thulium fiber laser at 1.91 microm.

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INTRODUCTION: The Thulium fiber laser may have several advantages over current urology lasers, including smaller size, more efficient operation, improved spatial beam quality, more precise tissue incision, and operation in pulsed or continuous-wave modes. Previous laser-tissue interaction studies utilizing the Thulium fiber laser have been limited to laser powers of less than 5 W, restricting potential medical applications. This study describes the preliminary testing of a high-power Thulium fiber laser for vaporization of the canine prostate, ex vivo.

STUDY DESIGN/MATERIALS AND METHODS: A continuous-wave, 110-W Thulium fiber laser operating at a wavelength of 1.91 microm, delivered 88.5 +/- 2.3 W of power through a 600-microm-core silica fiber for non-contact vaporization of canine prostates (n = 6).

RESULTS: The Thulium fiber laser vaporized prostate tissue at a rate of 0.83 +/- 0.11 g/minute. The thermal coagulation zone measured 500-2,000 microm, demonstrating the potential for hemostasis.

CONCLUSIONS: The high-power Thulium fiber laser is capable of rapid vaporization and coagulation of the prostate. In vivo animal studies are currently being planned for evaluation of the Thulium fiber laser for potential treatment of benign prostate hyperplasia (BPH).

PMID: 15662624 [PubMed - indexed for MEDLINE]