INTRODUCTION

• Erectile dysfunction (ED) significantly affects approximately 10 million men in the US.

• ED is often a negative consequence of robotic-assisted laparoscopic prostatectomy (RALP).

• Overall, up to 90% of men may have difficulties achieving erections sufficient for intercourse after RALP.1,10

• It common knowledge that sensory nerve fibers, such as a-beta and a-delta fibers, travel with the cavernous nerve in the pelvis.

• Testing penile sensations may provide quantitative measurement of erectile function.

BACKGROUND

• The cavernous nerves, located in the posterolateral aspect of the prostate, provide most of the autonomic input to erectile tissue.

• These nerves are often traumatized during RALP due to their close proximity to the prostate (see figure 1 below).

• No objective test(s) have been validated for assessing damage to the penile autonomic nerve supply.3,13

• Past studies have begun to demonstrate that penile sensation thresholds to cold and warm stimuli can assess penile innervation.3,9,13

• Yet, these studies assessing penile sensation thresholds after RALP have failed to follow subjects throughout the RP recovery period.

OBJECTIVES

• To assess changes in penile sensory thresholds and erectile function in subjects from pre-RALP through the surgical recovery period.

• This study was based upon previously published studies1,9,13 where changes in sensory thresholds were noted in patients after a RALP.

• By way of this assessment, we were aiming to evaluate the usefulness of penile sensory testing as a surrogate measure of cavernous nerve functionality.

Study Design:

This study was an observational, prospective, single-center, feasibility study.

Study Duration:

• 12 months of interviewing and penile sensory testing during preoperative and postoperative period.

• Subjects were evaluated at baseline (within 4 weeks before their prostatectomy procedure).

• Subjects completed 4 in person follow-up visits at 1 week, 4 weeks, 6 weeks, and 6 months and will complete a mailed questionnaire 12 months following surgery.

Study Measures:

• Questionnaires: The Expanded Prostate Cancer Index Composite (EPIC) is a robust prostate cancer health related quality of life questionnaire.

• The International Index of Erectile Function (IIEF)15 is a multidimensional self-report instrument for the evaluation of male sexual function. This validated tool was abbreviated for clinical use as the IIEF-5, also known as the Sexual Health Inventory for Men (SHIM).

• Penile Sensory Testing: The Neurometer® (see figure 2 below) was used to quantify the subject’s hypoesthesia or hypoesthesia, which is the relative sensitivity of the subject to painful stimuli, and outputs CPT values. The Thermal Sensory Analyzer (TSA 2001; Medoc, Ltd.) was used to apply warm and cold stimuli to test small nerve fibers.

Data Analysis:

Descriptive statistics were performed.

METHODS

RESULTS

• 4 men (mean age of 55 +/- 7.7 years) met inclusion/ exclusion criteria and each successfully underwent a preoperative visit as well as 4 visits postoperatively.

• Pre-operative SHIM score in all subjects was 25 (no ED). Mean post-operative SHIM scores were as follows: 1 week 18.5 +/- 11.7 (mild ED); 4 weeks 11 +/- 10.8 (moderate ED); 6 weeks 13.8 +/- 11.0 (mild to moderate ED); and 6 months 21.3 +/- 5.7 (mild ED).

• Table 1 (below) illustrates the trends between average SHIM score and average sensory thresholds at each visit.

• Analysis: SHIM scores trended downward following RALP and gradually recovered by the 6 month visit, as previously expected. CPT values were better associated with SHIM score (inverse correlation expected) when compared to thermal sensitivity but neither modalities provided statistically significant data, likely due to high variance from small sample size.

REFERENCES


CONCLUSIONS

• Penile current perception threshold sensitivity appeared to be better associated with SHIM score than penile thermal sensitivity.

• However, penile sensitivity measures did not statistically predict erectile function in this series.

• Future directions: Penile sensitivity remains a promising avenue to explore as it has the potential to more reliably assess erectile function than traditional methods, potentially resulting in more effective treatment. This study and others like it serve as a proof of concept for application to future randomized control trials(s).

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