

## EVALUATION OF THE TENSILE PROPERTIES OF TVT-O AND SUB-URETHRAL TAPE I-STOP® IN LONG-TERM FOLLOW-UP IN VIVO RAT MODEL

### Hypothesis / aims of study

Mid urethral slings became the gold standard of surgical management of stress urinary incontinence (SUI) in women. Tensile properties of these synthetic meshes may be an important factor in the evaluation of success of these slings.

Our objective was to examine the tensile properties of two transobturator synthetic tapes; (TVT-O) and (I-STOP) after in vivo implantation in a rat animal model for 1 year. Mechanical properties and morphological configuration of these synthetic meshes were also evaluated.

### Study design, materials and methods

1x2 cm strips of both TVT-O and I-STOP meshes were implanted in the inner part of anterior abdominal wall of 30 female Sprague-Dawley (SD) rats. Six rats were sacrificed at timed intervals: 6 weeks, and 3, 6, 9 and 12 months after implantation. TVT-O meshes consist of two type of fibers; blue and white, while I-STOP mesh consists of single type; white fibers. Width of the strips before and after implantation and its integrity were also determined. Stress (MPa), Strain (%) and Elastic Modulus (MPa) were measured and plotted in stress-strain relationship curves. The elastic modulus of the same type of fibre was compared over time for duration of 1 year. Elastic Modulus is the measure of the stiffness of an isotropic elastic material.

### Results

Stress, strain and modulus were measured at 6 weeks, and 3, 6, 9 and 12 months for fibres of the meshes and the elastic modulus for the different fibers of both meshes were consistent over time for both meshes.

Both meshes (I-STOP and TVT-O) retained their pre-implantation morphological characteristics as regards width of the tapes and morphological configuration.

I-STOP fibers maintained almost same stress break load and same amount of strain over time, while both TVT-O white and blue fibers showed less stress break load and less amount of strain at 12 months, but still maintained its elastic modulus over time.

All fibres maintained their elastic modulus over time, which is a reflection of the mesh stiffness.

### Interpretation of results

Both TVT-O white and blue fibers showed decreased stress break load and strain at 12 months, yet the clinical significance of this is unknown and needs further clarification. Elastic modulus for the different fibres of both meshes was consistent over time.

### Concluding message

1. Meshes retained their morphological characteristics (width of tapes and mesh configuration).
2. No statistical difference was observed over time in the elastic modulus of fibers tested.
3. Both meshes; TVT-O and I-STOP maintained their stiffness and elasticity over time (1 year follow-up period)

<b><i>Specify source of funding or grant</i></b>	<b>CL Medical</b>
<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>ANIMAL</b>
<b><i>Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?</i></b>	<b>Yes</b>
<b><i>Name of ethics committee</i></b>	<b>McGill University Animal Care Committee</b>