CONCLUSIONS: These results indicate that tramadol, a μ-opioid agonist, is effective for enhancing the active urethral continence reflex during sneezing at the spinal level (a microtubule transducer catheter measurement), thereby preventing SUI (a LPP measurement). Therefore, activation of μ-opioid receptors in the spinal cord may be a new candidate treatment for SUI in humans.

Source of Funding: Grant-in-Aid for Scientific Research (15K01377 and 15K01376)

PD50-10
GENE EXPRESSION AND PATTERNS OF SCARRING RESPONSE IN HUMAN FIBROBLASTS IN RESPONSE TO MESH AND CATHETER MATERIALS USING A NOVEL 3-D COLLAGEN MODEL
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INTRODUCTION AND OBJECTIVES: Scarring secondary to mesh and prosthetic materials is a serious clinical problem within the GU tract. Fibrotic matrices contain fibronec tin; and alpha-smooth muscle actin contributes contraction. Metalloproteinases (MMPs) such as MMP-1 and -3 can modulate matrix protein accumulation through degradation. Results from our institution have shown that silica materials can directly induce scarring through the interaction with tissue fibroblasts in vitro. By extension, we hypothesized that other materials may induce fibrotic changes through cellular matrix gene expression. Objectives: 1) to establish a 3D model of human fibroblasts to study patterns of fibroblast response to materials and 2) measure gene expression in human fibroblasts exposed to prosthetic and mesh materials compared to a control.

METHODS: Collagen gel was prepared by using 3 mg/ml in final concentration with 0.5% of polyvinyl alcohol (PVA). Mesh or catheter materials and human dermal fibroblasts (70,000 /ml) were added to a collagen gel and seeded in a 24-well plate (0.5 ml of gel in each well) to create a 3D environment for fibroblast response. After polymerization of collagen, another 250,000 cells in 0.5 ml medium were added on the top of gel. Cells were cultured at 37°C, 5% CO₂ for indicated time point. Images of cells were taken under reverse microscopy to determine the pattern of the scarring contraction. Gel cell matrix was harvested and digested with 1 mg/ml of collagenase for 15 minutes, pelleted by centrifugation and RNA was extracted. RT-PCR was performed for 32 cycles to analyze gene expression.

RESULTS: After 5 days, fibroblast contractions were identified surrounding prosthetic materials but not within the control. There were increases in type 1 collagen, α-smooth muscle actin and fibronec tin expression in fibroblasts exposed to prosthetic materials compared to fibroblasts grown in collagen gel alone. MMP-1 and MMP-3 were also detected.

CONCLUSIONS: Fibroblasts exposed to mesh and catheter materials responded with an increase in fibronec tin, alpha smooth muscle actin and type 1 collagen that is increased compared to controls. This may indicate why in vivo these materials induce fibrosis. Because fibronec tin, type 1 collagen and alpha smooth muscle actin are main components of scarring and their gene expression is elevated, future directions include development of medical devices that could induce downregulation of these genes.

Source of Funding: International Collaboration on Repair Discoveries (ICORD)

PD50-11
MANAGEMENT OF URINARY INCONTINENCE FOLLOWING SUB-URETHRAL SLING REMOVAL
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INTRODUCTION AND OBJECTIVES: We sought to evaluate de novo and persistent urinary incontinence outcomes following synthetic sub-urethral sling removal (SSR) in women.

METHODS: We reviewed a prospectively maintained database of 360 consecutive women who underwent SSR between 2005 and 2015. We excluded patients who had neurogenic bladder, non-synthetic or multiple slings, prior mesh for prolapse, concomitant surgery at the time of sling excision, urethral erosion or urethrovaginal fistula, post-operative retention, or less than 6 months follow-up. Demographics, type of sling, indications for removal, time to removal, and patient-reported outcomes were recorded. All SSR were performed transvaginally under general anesthesia with removal of as much sling as possible. Post-operative outcomes were stratified by type of incontinence (stress-predominant (SUI), urge-predominant (UUI), and mixed (MUI)). Subsequent management (observation/medications, minimally-invasive intervention (urethral bulking agent, sacral neuromodulation, onabotulinumtoxinA injection), or more invasive surgery (sling, bladder suspension)) was evaluated. Success or “dry” was defined by response of 0 (none) or 1 (rarely) on UDI-6 questions 2 and 3 and self-reported satisfaction with continence at last visit, and no further anti-incontinence intervention.

RESULTS: 99 patients met study criteria. Mean follow-up was 24 months (range 6-114). Mean duration from sling placement to SSR was 58 months (range 5-156). Median age and BMI were 55 years and 25.3 kg/m², respectively. 78% underwent prior hysterectomy and 64% were post-menopausal. 71% of slings were retropubic. Of 99 women, 27/72 (37%) experienced some degree of incontinence post-operatively; 26 with SUI (7 persistent, 19 de novo), 14 with UUI (6 persistent, 8 de novo), and 32 with MUI (13 persistent, 19 de novo). However, following a single minimally-invasive intervention, success rates rose to 81% in women with SUI, 86% in those with UUI, and 75% in those with MUI (Table).

CONCLUSIONS: Patients undergoing SSR may experience cure (~25%) or de novo or persistent urinary incontinence, with a higher predilection for UUI or MUI. However, after a single minimally-invasive intervention following SSR, success rates reached 75-86%.

Table. Management outcomes based on type of urinary incontinence after SSR.

<table>
<thead>
<tr>
<th># of patients</th>
<th>SUI</th>
<th>UUI</th>
<th>MUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial management</td>
<td>Observation; PPT: 13</td>
<td>Observation; medications: 11</td>
<td>Observation; medications; PPT: 17</td>
</tr>
<tr>
<td># of patients requiring 2 or more interventions</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Success rate after no additional interventions (%)</td>
<td>50</td>
<td>79</td>
<td>53</td>
</tr>
<tr>
<td>Success rate after one minimally-invasive intervention (%)</td>
<td>81</td>
<td>86</td>
<td>75</td>
</tr>
</tbody>
</table>

Abbreviations: PPT: pelvic floor physical therapy; SD: standard deviation

Source of Funding: None

PD50-12
HIGH CATASTROPHIZING IN PATIENTS WITH SELF-REPORTED PAINFUL MESH COMPLICATIONS HAVE POORER OUTCOMES
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INTRODUCTION AND OBJECTIVES: The pain catastrophiza tion scale (PCS) was developed to help identify those patients likely to have an exaggerated negative mental thought process in response to pain. Catastrophizing has been shown to be a risk factor for chronicity of pain, disability, and depression. Patients who catastrophize after surgery have worse outcomes and longer duration of pain. Given this, we sought to identify the rate of catastrophizing in cohort of patients with mesh complications and chronic pain.