**Abstract**

**Importance:** Surgical implantation of polypropylene mesh is a widely accepted and durable treatment for women experiencing stress urinary incontinence and pelvic organ prolapse; however, these surgeries carry a 1-11% risk of mesh exposure in the vagina, bladder, or urethra. Treatment often requires surgical mesh excision. In pilot studies using a porcine model, I have shown that exosome injections (purified exosome product; PEP) incite tissue regeneration and resolve vaginal mesh exposures.

**Objectives:** (1) replicate the pilot studies in a rabbit model of vaginal mesh exposure, evaluate (2) rates of bladder mesh exposure resolution following PEP injection versus sham and (3) the efficacy of PEP as a preventative therapy for mesh exposures.

**Methods:** 45 New Zealand white rabbits will be randomly divided into 3 groups:
1. Vaginal mesh exposure: Created via sacrohysteropexy procedure, injected with PEP or sham at 2 weeks
2. Bladder mesh exposure: Created via intentional cystotomy with a mesh sling, injected with PEP or sham at 2 weeks
3. Mesh exposure prevention: A high-risk for mesh exposure model will be used and treated with PEP or sham at the time of implantation

**Results:** Forthcoming

**Conclusions:** This novel study will build upon the prior evidence utilizing an exosome regenerative platform for vaginal mesh exposures. The proposed study will utilize a larger sample size and evaluate the breadth of application to inform clinical translation.

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**Purified Exosome Product**

**What are exosomes?**
Transporter vesicles that carry mRNA, antioxidants, signaling proteins
They activate host paracrine/autocrine pathways and mesenchymal precursors

**Purified Exosome Product (PEP)**
GMP grade, produced by RION LLC
Harvested from pooled human plasma
Shelf stable
Reconstituted in sterile water + bovine collagen

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**Figure 1: Preliminary Study Methods**

**Figure 2: Preliminary Study Results**

**AIM 1 – Vaginal Mesh, Rabbit Model**

**AIM 2 – Bladder Mesh Exposures**

**AIM 3 – Mesh Exposure Prevention**

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**Outcomes**

- For AIM 1 & 2: Sacrifice and tissue analysis at 6 weeks
- For AIM 3: A vaginal exam under anesthesia will be performed at 6 weeks & 12 weeks to assess for presence of mesh exposure
- Following intervention, all animals will be dosed with 2'-Deoxy-5-ethyluridine (EdU) to track cellular proliferation
- Mesh exposure resolution:
  - Yes/No for complete exposure resolution or surface area resolution for incomplete resolution
- H&E and Masson’s trichrome stains
- IHC will be used to quantify:
  - epithelial thickness
  - capillary density
  - macrophage ratio
  - cellular proliferation/regenerating proportions (EdU)

**Figure 3: Measuring surface area with ImageJ software**

**Significance**

Use of PEP as non-surgical management of mesh exposure
- Decrease healthcare costs
- Avoid repeat surgery/associated risks
- Prevent resection of mesh/return of symptoms
- Remove stigma surrounding use of mesh
- Future Directions: The authors plan to initiate a Phase I Clinical Trial

**References**


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