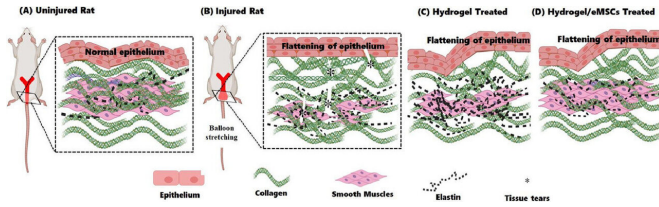


Stem cell therapy for pelvic organ prolapse

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Graphical abstract. Credit: *Applied Materials Today* (2020). DOI: 10.1016/j.apmt.2020.100890

Pelvic organ prolapse—POP—is a hidden disease. While the injury happens during childbirth, the patient may not know about the damage until many years later, often during menopause.

A potential new stem cell treatment, which is being developed in the laboratory but is not yet ready for human clinical trials, could potentially be given to [women](#) immediately after a traumatic childbirth. It means that invasive surgery could be avoided later in life.

This treatment is based on new research led by Dr. Shayanti Mukherjee and Ph.D. student Kallyanashis Paul. It follows on from earlier research by Hudson Institute's Professor Caroline Gargett that showed endometrial stem cells had tissue healing properties.

"What is really fascinating about this work is that we can potentially use a woman's own stem cells from her endometrium, delivered in a natural plant-based product—an [aloe vera](#)-based hydrogel—to heal the woman's own tissue injury," Dr. Mukherjee said.

The study, published in *Applied Materials Today*, suggests that local delivery of endometrial stem cells in an aloe vera hydrogel could reduce or eventually replace the need for pelvic floor reconstructive surgeries through early tissue repair and regeneration.

The research found that vaginal childbirth can damage tissue biomechanics, detectable at the nanoscopic level, and that this can be restored following the treatment. The study explored the hidden nature of this birth injury in preclinical models, and also validated the protective treatment delivering cells vaginally in the aloe vera-based hydrogel.

"Although birth trauma injuries occur during childbirth, its impact is often seen much later in life when women start developing symptoms such as vaginal bulge or a dragging sensation, and bladder, bowel, and sexual dysfunction," Dr. Mukherjee said.

The study's first author Kallyanashis Paul added: "POP is a hidden pandemic for women. It significantly disrupts their quality of life. This study, which contributes to a body of research aiming to create a tissue engineering treatment for childbirth injury to avoid women developing POP, could really make a big difference to the lives of women with the condition."

Hudson Institute Director and CEO, Professor Elizabeth Hartland, said all too often women's health problems have not attracted the attention that they so desperately need. "Pelvic organ prolapse is a hidden condition that is rarely talked about, and sometimes women feel embarrassed talking about it.

"Women deserve the best treatment possible so they don't have to continue to suffer from this condition. This cutting-edge research offers a glimmer of hope that people with POP will have better treatment options in future."

What is the significance of the research?

There is no reliable cure for POP. Transvaginal mesh implants have been used to treat POP. However, complications and side effects led to an Australian Senate inquiry into its use. The Therapeutics Goods Association then banned mesh for transvaginal surgeries, but allowed it for

abdominal prolapse operations.

A number of class actions have been brought against manufacturers of the mesh implants by women who suffered debilitating complications from their use.

What is pelvic organ prolapse?

Pelvic organ prolapse—POP—develops when tissues, [pelvic floor](#) muscles and ligaments that support the pelvic organs (bladder, uterus and bowel), become damaged, usually in childbirth, causing organs to shift or 'drop' into or outside the vagina. This can lead to debilitating symptoms, including poor bladder or bowel control and pain during sex.

More information: Kallyanashis Paul et al. Vaginal delivery of tissue engineered endometrial mesenchymal stem/stromal cells in an aloe vera-alginate hydrogel alleviates maternal simulated birth injury, *Applied Materials Today* (2020). [DOI: 10.1016/j.apmt.2020.100890](https://doi.org/10.1016/j.apmt.2020.100890)

Provided by Hudson Institute of Medical Research

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