**Post-Operative Pessary In native Tissue repair:   
a prospective, single blinded RCT**

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**LAY DESCRIPTION OF THE PROJECT**

This study is to determine if having a vaginal pessary device inserted intraoperatively at the end of vaginal prolapse surgery temporarily for 4 weeks will improve surgical results and patient satisfaction.

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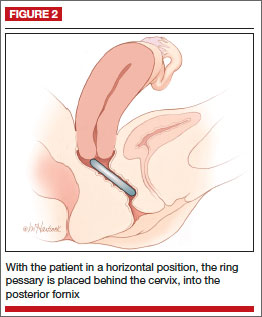
## INTRODUCTION

Vaginal prolapse is a common problem with approximately 1 in 10 women in the developed world requiring prolapse surgery in their lifetime[[1]](#endnote-1). The problem has a myriad of symptoms ranging from mild discomfort to being very problematic and having a huge impact on quality of life.

Surgery is generally seen as a last resort for managing vaginal prolapse, especially if a conservative method has been tried (eg: vaginal pessary device). However, the results of surgery alone are not perfect, and some women will develop recurrent prolapse or not be satisfied with the result.

The thought of having a vaginal pessary device inserted at the end of the operation is for the pessary device to take tension away from the native tissue and suture lines and hence improve tissue regeneration, healing without scarring, leading to better surgical results and patient satisfaction.

This could revolutionize the way we manage our level 1 and level 2 repairs and may result in better surgical outcomes, lower prolapse recurrence and better quality of life for our women in the long term.



Vaginal pessary device

## BACKGROUND

A system of three integrated levels of vaginal support has been described by DeLancey (image below). All levels of vaginal support are connected through a continuous endopelvic fascia support network[[2]](#endnote-2). Weakening of these levels of vaginal support contribute to pelvic organ prolapse.

Level 1 (upper level) suspends the vaginal apex from the lateral pelvic sidewall via the uterosacral-cardinal complex. Loss of level 1 support would result in vaginal and uterine prolapse.

Level 2 (middle level) is where the pubovesical and endopelvic fascia attach the anterior vaginal wall laterally to arcus tendinous fascia pelvis and the posterior vaginal wall is attached laterally to the fascia overlying the levator ani muscle via the rectovaginal fascia. Loss of level 2 support would result in cystocele and rectocele.

Level 3 (lower level) comprises of the perineal body, pubourethral ligament and perineal muscles. These all support the distal one third of the vagina. Loss of level 3 support would result in urethrocele and open genital hiatus.

For the purpose of this study, we will be focussing on women having level 1 and level 2 repairs - which can be a combination or in isolation of the following: vaginal hysterectomy, sacrospinous fixation, anterior apical (MUSPRAC) fixation, anterior and posterior repair. However, the results of surgery alone are not perfect and some women will develop recurrent prolapse or not be satisfied with the result. Isolated anterior prolapse recurrence ~7%, isolated apical recurrence ~10.5%, isolated posterior recurrence ~8% and multiple compartment recurrence ~20%[[3]](#endnote-3).

The pelvic supports undergo remodelling after distension from events such as childbirth in order to prevent prolapse. This process involves fibroblasts altering the components and structure of the extracellular matrix (ECM). Inadequate repair of the cross-linked ECM of the vagina and pelvic floor contributes to the development of POP.

Wound healing is a process that follows injury to tissues. The resulting level of function after healing depends on the tissue’s tendency to either scar or regenerate[[4]](#endnote-4). There are 4 phases to wound healing: homeostasis, inflammation, proliferation or scarring and remodelling. The inflammatory phase, in essence, is removal of damaged tissue, driven by immunological reactions. The more intense the inflammation, the greater the tendency for scar tissue formation; the less intense the inflammation, the greater the likelihood would be of remodelling with minimal scar formation[[5]](#endnote-5).

Native tissue regenerative surgery is the utilization of resident native tissue plus the manipulation of wound healing to enhance remodelling of damaged tissue to be morphologically and functionally normal. Variable tensions on the suture lines can lead to early breakdown of the vaginal repair or put tension on the native tissue and thereby stimulating the inflammatory reaction. To counter this, temporary splinting or support is required to keep the native tissue in place until proper strong collagen is being produced to strengthen the previous defective areas[[6]](#endnote-6).

This principal of wound healing in vaginal tissues has led to growing evidence suggesting that having a vaginal pessary device inserted intraoperatively by the surgeon at the end of vaginal prolapse surgery will provide extra support to the vagina as it heals. Vaginal pessary devices are already a widely accepted management option for prolapse, generally used as a conservative treatment option prior to considering invasive surgery. It is not painful or harmful and is well tolerated by patients[[7]](#endnote-7).

A vaginal pessary device is a removable device made of silicone. It is normally inserted into the vagina by a gynaecologist to support the prolapsed walls of the vagina and/or uterus. However, the indication in this instance is to take tension away from the native tissue and suture lines and hence improve tissue regeneration, healing without scarring, leading to better surgical results and patient satisfaction. This could revolutionize the way we manage our level 1 and level 2 repairs and may result in lower prolapse recurrence and better quality of life for our women in the long term.

A vaginal pessary device is safe to use both in the short and long term. There are various sorts of pessaries available. However for this study, we have opted to use a Shaatz type pessary device (picture on right) as it is the most applicable for keeping tension off the native tissue while providing extra support to the vagina as it heals from the surgery.

In our literature search, there are no current published prior studies, but there are 2 ongoing research projects looking at the same intervention method.

One is a study based in the United Kingdom by Pandeva et al titled “Native Tissue Repair with Surgical Pelvic Organ Pessary – an RCT”. They plan to recruit 120 patients with half the patients being randomised to have a pessary inserted into the vagina straight after prolapse surgery.

The other study is based in Israel by Klein zvi et al titled “The Effect of Pessary Post Vaginal Prolapse Repair, for One Month, to Reduce the Recurrence Rate of Prolapse”. They plan to recruit 100 patients to have a pessary inserted into the vagina straight after prolapse surgery.

## AIM(S) OF STUDY

### Primary Aim

This study is to determine if having a vaginal pessary device inserted intraoperatively at the end of vaginal prolapse surgery temporarily for 4 weeks will improve surgical results and patient satisfaction.

## OBJECTIVE(S)

### Primary Objective

All women planned to have Level 1 or Level 2 vaginal surgery will be invited to take part in this trial where half of those recruited will be randomised to receive a vaginal pessary inserted intraoperatively at the end of the surgery. Their surgical procedure would not be any different to someone who is not enrolled in the trial.

We have specific study outcomes to measure the success of this intervention

## HYPOTHESIS

### Primary Hypothesis:

### Insertion of a vaginal pessary device intraoperatively at the end of vaginal prolapse surgery temporarily for 4 weeks would have improved surgical results and patient satisfaction

## STUDY DESIGN

This will be a single-centre randomised controlled trial with the aim of recruiting 120 patients in total having level 1 and level 2 repairs over a 1 year period. Women who agree to take part in this trial will be randomised such that 60 patients will receive the intervention and 60 patients will have regular routine surgery. The actual surgery the patients have will not be any different had they not been in the study.

Patients randomised to the intervention arm will have a soft silicone vaginal pessary device inserted intraoperatively after vaginal repair surgery.

****At the time of recruitment, women will have a POP Q assessment done (image on right). The POP Q assessment is an internationally recognised and validated objective measure of severity of prolapse done by a trained clinician. This assessment will be carried out by one of the investigators (but not the operating surgeon). This assessment will be documented in their health record. Patients will also have to complete the pre-operative questionnaire.

All women will be reviewed post operatively at 4 weeks in the outpatient clinics to have the vaginal pessary device removed if they were randomised to intervention. The vaginal pessary device will be removed by the operating surgeon, but the POP Q assessment performed by one of the investigators (not the operating surgeon), so that the POP Q assessment can be done without bias.

There will be more outpatient clinic follow up appointments at 3- and 6-months post operation where the patients will have another POP Q assessment and complete the post-operative questionnaire. These 3 follow up appointments (4 weeks, 3 months and 6 months post operation) will occur regardless of which arm of the study the patients were randomised to.

At recruitment, patients will be assigned a study patient number so that any information collected will be de-identified. Collected data will be stored on a secure server (REDCap) accessible only to the investigators. The information will be destroyed after project completion and publication of our findings.

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## STUDY SETTING/LOCATION(S)

Recruitment and all follow up appointments will occur with Professor Rane in his private consulting rooms in Mater Pimlico, Townsville.

Their surgery will be performed by Professor Rane at Mater Pimlico, Townsville.

Professor Rane also has a urogynaecology fellow (not the operating surgeon) who will facilitate the consent process and first post-operative review.

## STUDY DURATION

The anticipated timeline for this study is 22 months

## STUDY POPULATION

### Recruitment Process

Women who fit the inclusion criteria below, have been seen by Professor Rane in his rooms and consented for Level 1 or Level 2 vaginal repairs will be offered the chance to be a part of this trial. Professor Rane, his fellow or his nursing staff will be able to explain the study in detail to the patients. Clinical questions related to the trial will be answered by Professor Rane or his fellow. Otherwise questions related to logistics can be answered by his nursing staff in his rooms.

A patient information sheet and consent form will be given to the patient for their perusal and they can return the consent form to his administrative staff in his rooms at their own convenience or they can bring the consent form with them on the day of their operation. There is no time limit on how long they need to consider if they want to be part of the trial as long as they make their decision before their operation day.

It will be made clear to the patients that enrolment in the trial is voluntary, they can withdraw their consent at any time with absolutely no impact on the surgery they are planned to have given that the planned surgery would not differ whether they are on the trial or not. This would then be less likely to be a “coerced” decision.

### Inclusion criteria

* Women (18 years and over) with symptomatic pelvic organ prolapse requiring an anterior vaginal repair at our facility
* Medically fit for surgery
* Able to complete the questionnaire independently with reasonable level of English and English is their first language
* Patients that have not been recommended surgery that involves colpocleisis, mesh or other surgical approach (such as laparoscopy or laparotomy)

### Exclusion criteria

* Asymptomatic pelvic organ prolapse
* Refusal to participate
* Women of non-English speaking background

### d. Potential for risk, burdens and benefits

There is a possibility that the pessary might be uncomfortable for patients to have post-operatively. Patients would be encouraged to present to the rooms sooner than the 4 weeks to have the pessary removed and we will report this in our findings.

Benefit for this intervention is better wound healing, improved cosmetic effect, patient satisfaction and reduced risk of prolapse recurrence

## STUDY OUTCOMES

### Primary Outcome

* + 1. Success in anterior compartment at 6 months post operation

Success is defined as a composite of objective findings and subjective patient report. Objective anatomic success is defined as anterior prolapse no greater than Stage 1 (reference point Ba < -1cm on POPQ examination.

Subjective success as defined as absence of “bulge” symptom based on the PDFI-20 validated questionnaire. Failure will be defined as leading edge of anterior vaginal wall a Stage 2 or more (reference point Ba ≥ -1cm) or presence of “vaginal bulge” symptom on validated questionnaire.

### Secondary Outcome(s)

* + 1. Change in POPQ quantitative measurements from baseline at 6 months post operation
    2. Anatomic success of any associated posterior repair procedure at 6 months post operation. Objective anatomic success as posterior prolapse no greater than Stage 1 (reference point Bp < -1cm) on POPQ examination
    3. Anatomic success of any associated apical repair procedure at 6 months post operation. Objective anatomic success as apical prolapse no greater than Stage 1 (reference point C < -1cm) on POPQ examination
    4. Ten point Patient Global Assessment of Change (PGA-C) visual analogue scale 4 weeks post operation
    5. Ten point Patient Global Assessment of Change (PGA-C) visual analogue scale 3 months post operation
    6. Ten point Patient Global Assessment of Change (PGA-C) visual analogue scale 6 months post operation
    7. Complications of surgery as per Clavien-Dindo Classification[[8]](#endnote-8) (Appendix A)

## STUDY PROCEDURES

### Recruitment and consent of participants

As mentioned earlier in the recruitment process and inclusion/exclusion criteria, patients will be given the information sheet and consent form for them to complete in their own time pre-operatively up till and including the day when they present for surgery as there will be no difference or impact on the surgery they are planned to have.

### Withdrawal of participants from a study

Participation in the study is voluntary and patients can withdraw their participation consent at any time without impacting on the care that they will receive. Patients can fill in the withdrawal of consent form at any time.

### Randomisation

Patients will be randomised electronically via REDCap. Out of the 120 suitable patients, half will be randomised to receive the vaginal pessary device.

### Measurement tools used

The measurement tools we are using in this trial has an objective component and a subjective component. The objective measurement tool is the POP Q assessment (image 2) at their first consult appointment and reassessment at 3 months post operatively. We are also using the pre-operative and post-operative questionnaires. The post operative questionnaire would include a Ten point Patient Global Assessment of Change (PGA-C) visual analogue scale to determine how satisfied they are with their surgery.

### Study involvement by participants

Participants will need to do a pre operation and post operation questionnaire, which is already current standard practice in Professor Rane’s rooms. Participants will be required to have follow-up appointments in Professor Rane’s rooms at 4 weeks, 3 months, and 6 months. The post-operative questionnaire will be repeated at the 6-month appointment.

### Data management

All data collected from this study will be deidentified and stored on a secure database (REDCap) accessible only to the investigators. This data will be retained for 15 years before being destroyed and deleted off the secure database permanently.

### Safety considerations/Patient safety

Vaginal pessaries are already a widely accepted management option for prolapse, generally used as a conservative treatment option prior to considering invasive surgery. It is not painful or harmful and is well tolerated by patients. Some side effects include:

* Some discomfort/awareness of having the vaginal pessary device.
* An increase in vaginal discharge.
* Risk of vaginal erosion however this usually occurs if the device is left in the vagina for more than 3 months. This risk is significantly lower as the device will only be left in the vagina for a maximum of 4 weeks duration.

We acknowledge that some women might find it uncomfortable and may need to have the pessary removed sooner than the planned 4 weeks. Patient comfort and safety comes first, and we will remove the pessary and report it in our outcomes.

Should patients have questions about the study, they can contact the nursing staff in Professor Rane’s rooms or his urogynaecology fellow (who will not be the operating surgeon in this study).

## SAMPLE SIZE AND DATA ANALYSIS

### Sample size and statistical power

Information about sample size and statistical power was sought from a statistician (Venkat Vangaveti) in James Cook University, Townsville.

From background literature search, the risk of recurrence of prolapse is 30 – 40%. We are hoping that with our intervention, it would result in a 25% reduction and hence 58 patients are required in each arm of the study. These calculations are based on a power of 80% and a type I error of 0.05.

## ETHICAL CONSIDERATIONS

If the patients experience pain or discomfort from the pessary, we will remove it and report it on our outcomes.

1. Participation in the study is voluntary and patients can withdraw their participation consent at any time without impacting on the care that they will receive.
2. All data collected from this study will be deidentified and stored on a secure database (REDCap) accessible only to the investigators. This data will be retained for 15 years before being destroyed and deleted off the secure database permanently. Patients will be allocated a study number which will be used on the secure database. This number will be saved in their health record so that we can reidentify the patients during the follow up appointments.
3. Funding will be sought through an AVANT or RANZCOG grant application. The funding will only be used for the purchase of the intervention pessaries.
4. No member of the research team will receive personal financial benefit from patients being involved in the project (other than their ordinary wages).
5. Ethics will be sought through the Mater Misericordiae Ltd Human Research Ethics Committee.

## DISSEMINATION OF RESULTS AND PUBLICATIONS

The project will be presented at our multidisciplinary meetings within the Obstetrics and Gynaecology department. The aim is to get this research project published in an international journal in the wish of contributing to the current literature since there is a paucity of data in regards to using a vaginal pessary device in the short term post operatively. We will offer to send a digital copy of the published article to patients.

## OUTCOMES AND SIGNIFICANCE

Given there is currently no published study looking at this intervention, and there is a paucity of data in regards to using a vaginal pessary in the short term post operatively, our project would be a contribution to the current literature.

If this intervention is proven successful, it could revolutionize the way gynaecologists manage level 1 and level 2 repairs. This may result in lower prolapse recurrence and better quality of life for our women in the long term.

## BUDGET

|  |  |  |  |
| --- | --- | --- | --- |
| Item/s | BUDGET for Site | In-Kind | Cash |
| FUNDING | | | |
| Grant – via AVANT or RANZCOG (pending ethics approval) |  |  | $4,000 – to purchase the Shaatz vaginal pessaries |
| EXPENSES | | | |
| Personnel |  |  |  |
| Principal Investigator, associate investigator and supervisor |  | 0.2 FTE per person |  |
| Research equipment |  |  |  |
| Shaatz vaginal pessary |  |  | Via AVANT or RANZCOG grant as listed above |
| Publication |  |  | article publication fee – to be determined |
| Miscellaneous |  |  |  |
| HREC application fee |  |  | No HREC application fee |
| Site Specific Application (SSA)/ Governance fee |  |  | No SSA/Governance fee |
| TOTAL Expenses |  |  |  |

## APPENDICES

**Appendix A**

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## REFERENCES

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