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Original Research Article

Meshplasty treatment for stress urinary: a prospective clinical trial

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ABSTRACT

Background: Stress urinary incontinence is when there is involuntary loss of urine due to increase intra-abdominal and intravesical pressure.

Methods: This is a prospective clinical trial which was conducted at a Municipal General Hospital in Mumbai in the Department of Obstetrics and Gynecology for a period of 10 years from January 2005 to December 2015. The study group consisted of 518 cases with clinically demonstrable SUI with or without pelvic floor defects. Meshplasty was performed as a choice of surgery for SUI correction.

Results: The study group was divided based on age(25-40,41-55,>55),parity(I,II-III,>IV), symptoms (SUI, Dysfunctional uterine bleeding, prolapse), type of anaesthesia (local, general/spinal anaesthesia), surgery performed (meshplasty alone, meshplasty with cystoectocoele repair, meshplasty with vaginal hysterectomy (VH), meshplasty with VH with cystoectocoele repair, meshplasty with VH with cystoectocoele repair with sacrospinous fixation), complications (mesh rejection, urine retention).

Conclusions: Meshplasty is a simple inexpensive procedure with short learning curve. This has a 94% success rate.

Keywords: Meshplasty, Polypropylene mesh, Stress urinary incontinence

INTRODUCTION

Stress urinary incontinence (SUI) is defined as involuntary loss of urine due to increased intra-abdominal and intravesical pressure, which exceeds the pressure that the urethral closure mechanism can withstand and little urinary loss results.^{1,2} Stress incontinence affects 15-60% of women. Stress incontinence is a disorder of young as well as old people.

More than a quarter of nulliparous, young college, athletes experience stress incontinence while participating in sports.^{2,3} We have older methods like Kelly's repair and abdominal bladder neck suspension surgeries. The newer techniques are Tension-free vaginal tape (TVT), trans-obturator tape (TOT) and meshplasty.¹⁻⁴

Principle of meshplasty

Recent advances in the mechanism of SUI show that the support at midurethral level is weak resulting into sagging of midurethra. Whenever intra-abdominal pressure rises while coughing, sneezing, The intravesical and the proximal urethral pressure becomes more than that in the midurethra resulting into dribbling or urine (SUI).² It will be irrational to use this already weak and torn pubovesicocervico vaginal fascia to support the urethra.² It may give temporary relief but not long term success as seen in Kelly's plication suture. Hence these supports should be enhanced and re-established by using synthetic material like polypropylene mesh, to provide a permanent solution. We innovated the technique of meshplasty for SUI correction in which the lost fascial support of mid urethra is re-established by simply fixing the flexible, non-absorbable, non-reactive polypropylene

mesh (hernia mesh) at midurethral level. The polypropylene mesh provides mechanical support at the place of the torn and detached pubocervical fascia.³ The mesh gets interpenetrated by fibrous tissue, creating a tough scar and so causing permanent support for the midurethra.

METHODS

This prospective clinical trial was conducted at Municipal General Hospital in Mumbai for a period of 10 years from January 2005 to December 2015 and comprised of 518 cases in which Meshplasty was performed as a choice of surgery for SUI correction.

Inclusion criteria

- Any age group
- Any parity
- Clinically demonstrable stress urinary incontinence
- With or without associated pelvic floor defect
- Positive Marshal and Bonney's test, and Q-Tip test

Exclusion criteria

- Urge incontinence
- Urinary tract infections (UTIs)

All the patients should be thoroughly evaluated by detailed history, urogynecological symptoms questionnaire, and complete physical examination. All patients had positive Marshall Test and Bonney test. The cough test is recommended prior to surgery. Urodynamic investigations are not essential prior to surgery provided the clinical assessment is fully comprehensive (standardised questionnaire, cough test, bladder diary, post void residual volume) with concordant results (PC).

In all patients' polypropylene mesh of adequate size is placed loose at midurethral level, extending from one paraurethral gutter to the other.

Written informed consent is taken. Cefotaxim 1g intravenously is given to all the patients just prior to the anaesthesia.

Surgical technique

Meshplasty can be performed under local and spinal anaesthesia in lithotomy position. Injection Saline adrenaline infiltration (1:2,00,000) is used for local anaesthesia. The indwelling Foley's catheter helps to define the midurethra and location of bladder neck.

Two allies forceps applied at mid urethral. Small vertical incision is taken between two allies' forceps on the vagina. Both side paraurethral spaces are created by mosquito forceps. A polypropylene mesh used in hernia repair measuring approximately 3-4cmx1 cm is placed at

midurethral level. In patients with only SUI, the mesh is kept (no fixation sutures require) in the dissected space at mid urethral level mesh is placed in a tension freeway, so that a small forceps can be easily passed beneath it and vagina was closed above it with vicryl no 3-0. In the patients with only meshplasty, catheter is removed the evening of surgery or the next morning. Patient can be discharged.



Figure 1: Mesh at midurethral level.

In patients requiring hysterectomy and anterior colporrhaphy, vaginal hysterectomy is performed first, followed by dissection of anterior vaginal wall as is being done in standard anterior colporrhaphy (Figure 1). The mesh is fixed laterally by anchoring its angles to the pubocervical fascia along with vagina using polyglatin No.3-0 suture. Mesh is fixed in a tension freeway, so that a small forceps can be easily passed beneath it. After placement of this mesh anterior colporrhaphy is performed. The patients with anterior colporrhaphy, Foley's catheter are removed on Day 3 of surgery.

All patients are checked for residual urinary volume, which is less than 50 mL. At the time of discharge, patients were instructed to avoid strenuous physical activities and sexual inter.

Postoperatively care

- Patients were ambulated by evening
- Vaginal pack, if kept, was removed the following day
- Antibiotics

The catheter is removed on same day or day three depending on the other ancillary procedures that have been performed and the residual urinary volume is measured. We also looked for any leak with Valsalva's maneuver. The patients are called at weekly intervals for one month and monthly for 6 month then every 6 monthly till date.

During each weekly visit, a mild vaginal douche is given with hydrogen peroxide and betadine and the process of healing is studied. We look out for signs of mesh

rejection. During each visit they are questioned regarding recurrence of previous symptoms. The cure of SUI is based on absence of urinary complaints and no urinary leakage with Valsalva's manoeuvre. The criteria for failure of surgery are any patient complaining of recurrence of previous symptoms, or having demonstrable urinary leakage.

Follow up

- Weekly for 1 month
- During each weekly visit, a mild hydrogen peroxide and betadine vaginal douche was given.
- Pattern of healing was studied.
- Signs of mesh rejection if present were noted
- Followed by once a month till 6 months and 6 monthly for 2 years and yearly till date
- Out of 518 cases, 146 patients are lost to follow-up during different intervals. In the remaining 372 cases, follow-up time varied from 1 month to 6yrs.

RESULTS

In our study we have performed 518 cases in 10 years of period; the maximum number of patient was in age group of 41-55 i.e. 51.73% after that 25-40 years of age group i.e. 37.25%.the commonest after patients were para 2 or more 289 cases i.e. 55.79%.

Table 1: Distribution of cases according to surgical procedure performed.

Surgery	Number
Only meshplasty	205
Cysto-rectocele repair	74
Vaginal hysterectomy with a-p repair	114
Vaginal hysterectomy with a-p repair with sacrospinous fixation	28
Vault prolapse repair with sacrospinous fixation	18
Vaginal hysterectomy	79

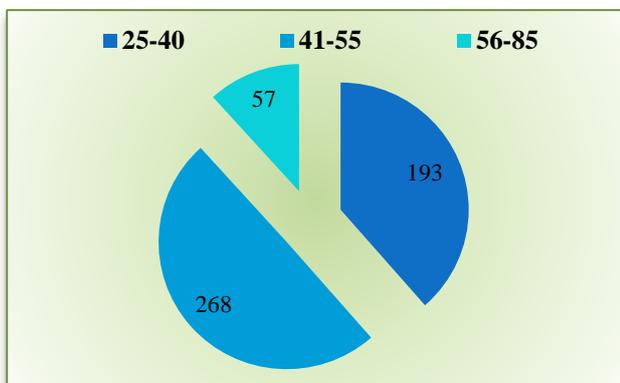


Figure 2: Distribution of cases in relation to age.

Commonest presentation was SCOPV in 286 cases i.e. 55.2% followed by dysfunctional uterine bleeding 169 cases i.e.55.2% and 63 patients were presented with only SUI.

Table 2: Complications.

Complications	Cases	Percent
Mesh rejection	22 cases	4
Retention of urine	12 cases	2

Out of 518 cases the maximum cases were done under spinal anaesthesia and 160 cases done under local anaesthesia. We had combined the meshplasty with other major surgeries that's why the maximum cases were done under spinal anaesthesia.

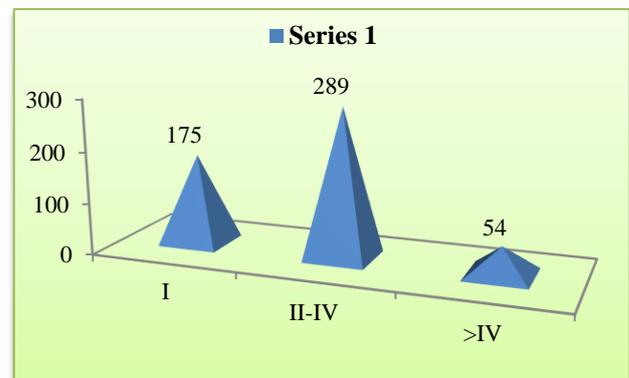


Figure 3: Distribution of cases in relation to parity.

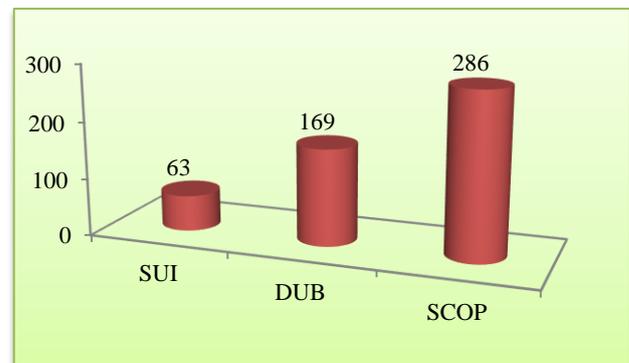


Figure 4: Distribution of cases according to symptoms.

Only meshplasty was performed in 205 cases i.e. 39.57%. Cystorectocele repair in 74 patient's i.e. 14.47%. Vaginal hysterectomy with AP repair was done in 114 cases i.e. 20%.

Vaginal hysterectomy with AP repairs with sacrospinous fixation in 28 cases i.e. 5%. Vault prolapse repair with sacrospinous fixation was done in 18 cases i.e. 3.4%. Vaginal hysterectomy with meshplasty was done in 79 cases i.e. 15.25%. We had very less complications like

mesh rejection in 22 cases i.e. 4% and retention of urine in 12 cases i.e. 2%.

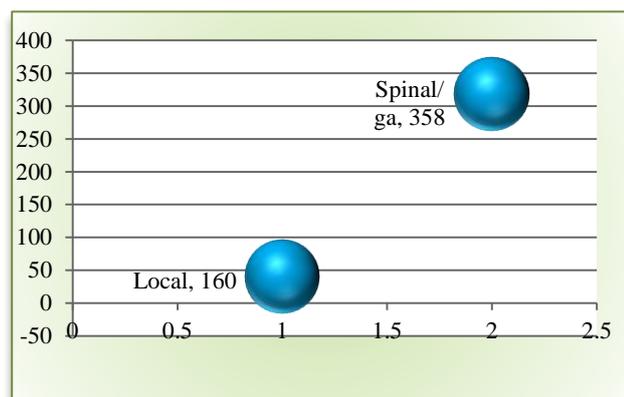


Figure 5: Distribution of cases in relation to type of anaesthesia used.

DISCUSSION

This prospective clinical trial was conducted at Municipal General Hospital in Mumbai in Dr. R. N. Cooper Hospital for a period of 10 years from January 2005 to December 2015 and comprised of 518 cases in which Meshplasty was performed as a choice of surgery for SUI correction.^{5,7}

First case of meshplasty for SUI is performed in 2005 at Dr. R. N. Cooper hospital by Dr. Rajendra M. Saraogi. Meshplasty is a very simple and quick procedure, which can be performed under local anesthesia. It can be performed in patients with medical disorders like hypertension, diabetes, heart disease. It can be performed in remote places where minimum facilities are available. It has a short learning curve. Hospital stays of 1 day or maximum 3 days when other ancillary procedures are performed. It does not require any special skill or any special surgical instrument. Duration of procedure: It is very quick procedure. Isolated meshplasty procedure requires 10-15 minutes. Assistance from other surgical faculties like urology is not required. Intra operative complications: None of these patients had any haemorrhage, injury to bladder, urethra and other existing structure. Postoperative complications like febrile illness, morbidity, local and systemic infection are not seen in any of the patients. Retention of urine was seen in 2% of cases, which was treated after prolonged catheterization. Mesh rejection was seen in 4% cases, which were not rejection per se but were erosions under the mesh which was treated with betadine ointment application and oral antibiotic treatment. Success rate: No recurrence has been recorded till date. None have reported with failure, thus

giving almost 99% cure rates for SUI. Cost effectiveness: Mesh plasty is cost effective in comparison to other corrective surgery like sling surgeries (TVT, TOT, T-SUIT and retro pubic colpo suspension). Here we used hernia mesh which was cut into 3x1cms. One hernia mesh can be used for at least 10 patients.

CONCLUSION

We have performed 518 cases in our institutes without any major complication with success rate of 99%. This preliminary report shows that our innovative procedure of meshplasty is simple, easy to perform, efficient and cost effective. Every gynecologist can do it independently without the help of urologists.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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