

**Video Presentation**

**MODIFICATION OF MID-URETHRAL SLING PROCEDURE - “SLING ON STRING” WITHOUT USING COMMERCIALY AVAILABLE TRANS-OBTURATOR TAPE**

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**ABSTRACT**

Mid urethral sling operation is the most effective surgical procedure for the stress urinary incontinence. Unfortunately, cost is a major drawback for the commercially available slings. Most of the government hospitals in India doesn't provide commercially available sling but polypropylene mesh is widely available for the hernia surgery. If we cut a longitudinal strip of 1.5 cm breadth from the Polypropylene macroporous (>40 micron) mesh 6' X 3' mesh and apply over the mid urethra then the cost can reduce where the resource is limited. The rest part of the mesh for future use can be preserved aseptically. So, from a single mesh of 6' X 3' size we can serve up to five patients.

**Key Words:** Mid-urethra, sling, stress urinary incontinence

**Description of technique:**

Materials required < Polypropylene macroporous (>40 micron) mesh 6' X 3', Modified TOT (outside –in) needle (made at Dept of Obstetrics and Gynaecology, College of Medicine & J.N.M. Hospital), 1-0 Polypropylene suture < dissect mid-urethral region 1 cm < stab incision at the junction a line from clitoris touches labio-crural fold and 1.5 cm below the insertion of adductor longus < Remove the mesh from the packet and make a 1 cm longitudinal strip from the mesh< attach 1-0 Polypropylene suture thread on both side of the mesh end to make the cumulative length more as only 6' (15 cm mesh length with not pass through from one side to other side)< Insert modified TOT (outside –in) needle through stab incision side in right side from outside-in < when tip seen at suburethral region attach Polypropylene suture thread to needle tip < remove needle in reverse direction in the

same track of entry< the Polypropylene suture will comes out through the stab entry and hold the suture with an artery forceps < Insert modified TOT (outside –in) needle through stab incision side in opposite side (left) and similar way when tip seen at suburethral region attach Polypropylene suture thread of the opposite side to needle tip < remove needle in reverse direction in the same track of entry < similarly the Polypropylene suture will comes out through the stab entry of left side and hold the suture with an artery forceps < pull the Polypropylene string on both side simultaneously keeping an artery forceps in between urethra and Polypropylene mesh < cut the excess suture on both side a few mm below the skin level < close sub-urethral incision with 2-0 polyglactin suture or 2-0 polyglecaprone suture (Monocryl). In our institution we have closed the suburethral incision with 2-0 polyglactin suture as it was hospital supply.

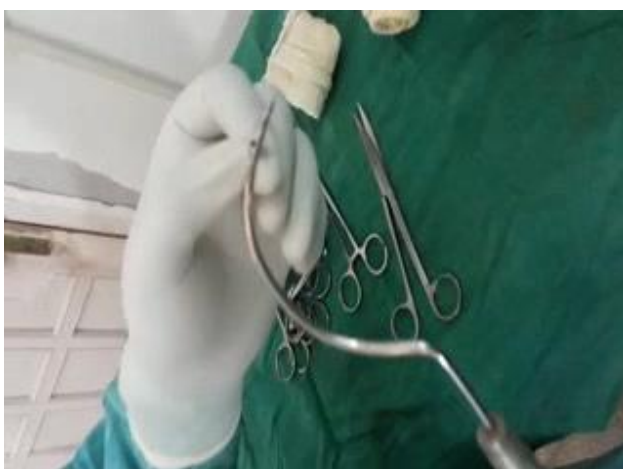
**Fig:** Polypropylene macroporous (pore size more than 40 micron) mesh 6' X 3' and cutting of a mesh strip



**Fig:** Dissection of mid-urethral zone and insertion of modified needle through the stab incision



**Fig:** Demonstration of Modified needle and attaching polypropylene suture with the mesh end



**Fig:** Removal of modified needle through the stab incision opposite side & placement of sling



**Result:**

The study included 71 women who met the inclusion criteria and signed informed consent. No significant intergroup differences noted in term of menopausal status, mean age, parity, mean BMI, utero-vaginal prolapsed, positive stress test, abdominal leak point pressure, Impact Incontinence Quality of life (IIQ-7) Score, Incontinence Severity Index (ISI) Category. No patients presented with detrusor over activity. The follow-up was at one, three and six month and thereafter at first and second year for both groups. Table 1, shows intra-operative and immediate post-operative data, which revealed significantly longer mean operative time for 'Sling on String' group i.e.  $33.3 \pm 10.9$  minutes than the TOT group i.e.  $19 \pm 5.5$  minutes. However the cost per patient was approximately INR 6000 for the TOT-O group availing the best price in the market, where as it was only INR 500 for the Sling on string group. As though the polypropelene maroporous mesh (supplied in hospitals for hernia operation) was available in free of cost in hospitals but the market price of 6' X 3' (15 cm X 7.5 cm) mesh is approximately INR 60013 which can be used for 5 patients as a 1.5 cm breadth longitudinal strip (Sling). Along with that one No 1 polyglactin suture (String) which costs about INR 150-20014 and another 2-0 polyglactin suture costing about INR 200-250 15 are also required for the closure of the sub-urethral incision. Two cases in 'Sling on String' group suffered from perineal pain (5.5%) in the immediate post-operative period. Single patient suffered from urinary retention in both groups who relieved by intermittent self-catheterization. During follow-up up to two years all patients were negative for stress test in both groups. In each group patient significantly improved on IIQ-7 questionnaire and Incontinence Severity Index (ISI). More than 80 % patients were dry as per ISI at three month follow up in both groups. During final follow up at 24 months more than 95% patients were dry ISI. There were no significant intergroup differences noted in clinical examination (stress test), questionnaires (IIQ-7 and ISI) in both groups during follow up.

Table 1: Baseline Pre-operative data in study groups

Parameters	'Sling on String' group (n=36)	'TOT-O' group (n=35)	P value
Post-menopausal	19 (52.7%)	17 (48.6%)	0.168
Mean age (years)	58.8 ± 6.1	60.6 ± 11.0	0.196
Parity (Vaginal)	4.0 ± 1.9	4.4 ± 2.7	0.642
Mean BMI (kg/m <sup>2</sup> )	22.5 ± 3.1	22.8 ± 2.1	0.818
Prolapse (POP-Q -I)	14 (38.9%)	15 (42.8%)	0.952
Positive stress test	36 (100%)	35 (100%)	0.515
Abdominal Leak Point Pressure (ALPP) (cm H <sub>2</sub> O)	45.2 ± 11.3	44.6 ± 14.7	0.147
Impact Incontinence Quality of life (IIQ-7) Score	23.6 ± 4.4	22.5 ± 5.2	0.582
Incontinence Severity Index (ISI) Category			0.667
Dry	0	0	
Slight	0	0	
Moderate	20 (55.56%)	18 (51.4%)	
Severe	16 (44.44%)	17 (48.6%)	

Table 2: Comparison of Peri-operative (intra – operative and immediate post-operative) parameters

Parameters	'Sling on String' group (n=36)	'TOT-O' group (n=35)	P value
Mean operative time (Min)	33.3 ± 10.9	19 ± 5.5	<b>0.001</b>
Intra operative bladder injury	0	0	-
Length of hospital stay	4.2 ± 1.2	4.6 ± 1.0	0.671
Urinary Retention	1 (2.78%)	1 (2.85%)	-
Perineal Pain	2 (5.5%)	0	
Procedure related cost (INR)	500	6000	<b>&lt; 0.0001</b>

Table 3: Comparison of Post-operative parameters at follow up

		'Sling on String' group (n=36)	'TOT-O' group (n=35)
Positive Stress Test	Pre -OP	100%	100%
	1 Month	0% <b>(&lt;.001)</b>	0% <b>(&lt;.001)</b>
	3 Month	0% <b>(&lt;.001)</b>	0% <b>(&lt;.001)</b>
	6 Month	0% <b>(&lt;.001)</b>	0% <b>(&lt;.001)</b>
	1 <sup>st</sup> Year	0% <b>(&lt;.001)</b>	0% <b>(&lt;.001)</b>
	2 <sup>nd</sup> Year	0% <b>(&lt;.001)</b>	0% <b>(&lt;.001)</b>
Mean IIQ-7 Score	Pre -OP	23.6 ± 4.4	22.5 ± 5.2
	1 Month	0.71 ± 2.5 <b>(&lt;.001)</b>	0.78 ± 2.7 <b>(&lt;.001)</b>
	3 Month	0.35 ± 1.2 <b>(&lt;.001)</b>	0.42 ± 1.1 <b>(&lt;.001)</b>
	6 Month	0.18 ± 1.4 <b>(&lt;.001)</b>	0.19 ± 1.2 <b>(&lt;.001)</b>
	1 <sup>st</sup> Year	0.08 ± 0.9 <b>(&lt;.001)</b>	0.11 ± 0.9 <b>(&lt;.001)</b>

	2 <sup>nd</sup> Year	0.06 ± 0.92 <b>(&lt;.001)</b>	0.05 ± 0.93 <b>(&lt;.001)</b>
<b>Dry ISI</b>	Pre -OP	0 %	0 %
	1 Month	83.3 % <b>(&lt;.001)</b>	82.6 % <b>(&lt;.001)</b>
	3 Month	92.3 % <b>(&lt;.001)</b>	90.6 % <b>(&lt;.001)</b>
	6 Month	94.6 % <b>(&lt;.001)</b>	93.9 % <b>(&lt;.001)</b>
	1 <sup>st</sup> Year	91.8 % <b>(&lt;.001)</b>	94.7 % <b>(&lt;.001)</b>
	2 <sup>nd</sup> Year	95.4 % <b>(&lt;.001)</b>	95.8 % <b>(&lt;.001)</b>

\* Data in parenthesis denotes *p*-values comparing pre-op and post-op parameters in same study group.

**Video available trans-obturator tape journal online version. ([www.iaog.in](http://www.iaog.in)).**

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