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The use of hand-made, surgeon tailored propylene mesh in solving Stress incontinence in countries with limited resources. A preliminary report on twenty one patients

Open Access **Research Article**

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Abstract

Objective: To evaluate the efficacy of surgeon-tailed (hand-made) propylene mesh used in TOT for female stress urinary incontinence (SUI) in a low income country.

Patients and Material: Twenty one patients underwent Transobturator Tape (TOT) using a surgeon-tailored propylene mesh using the "outside in" method. All patients were evaluated by history taking including surgical, gynaecological and obstetric history, physical examination, Bonney's test, laboratory tests, abdominopelvic ultrasound investigations and urodynamic evaluation. Preoperatively, data was obtained pertaining to parity, past pelvic surgery and menopausal status. Noted was the intraoperative blood loss, length of hospital stay. Post operative evaluation was done at 1st, 3rd and 6th months, then one year. Evaluation included repeat of Bonney's test, urodynamic studies and measurement of post void residual urine by ultrasound device.

Results: All except one were cured after 1st month. The other was continent after 3 months. No post operative haematoma or infected meshes were recorded. Cystomeric measures were normal with no recorded detrusor instabilities. Post void residual urine volume was nil for all the patients

Conclusion: The preliminary result shows that the use of simple, inexpensive hand-made propylene mesh for TOT appears to be effective.

Keywords: Lithotomy position; Mixed urinary incontinence; Stress urinary incontinence; Transobturator tape; Urodynamic studies.

Introduction

Any complaint of involuntary loss of urine is regarded as a symptom of urine incontinence by the International Continence Society (ICS) *[1]*. There are three types of urinary incontinence. When this occurs during exertion either by exercise, coughing, laughing or sneezing in the absence of detrusor muscle contraction then it is termed stress urinary incontinence (SUI) *[2]*. SUI is classified in accordance with the McGiure classification as: type I when the leak pressure point is higher than 90cm H_2O, type II when the leak pressure point is 90-60cm H_2O and type III when the leak point is less than 60cm H_2O *[3]*. Urgency urine incontinence is when the involuntary leakage of urine is preceded by urgency. Mixed Urinary Incontinence is when the leakage is associated with urgency and with exertion. The most prevalent of them is stress urinary incontinence (SUI). It's prevalence is between 4-35% *[4]* and adversely affect the quality of lives of affected women after middle age due to pregnancies and vaginal deliveries *[5]*. Although, data indicates a higher incidence in multiparous women *[6,7]*, it is observed in 16-31% of nulliparous women *[8,9]*. Other risks factors associated with genuine stress incontinence include aging, smoking and post menopausal atrophy *[4,10]*. Abdominal ultrasound, urodynamic studies are some of the procedures employed as diagnostic tools. Initially management is conservative methods such as pelvic floor muscle exercises, electrical stimulation, pharmacological agents and the use of pessaries. The pharmacological agents include estrogens, tricyclic antidepressants, alpha adrenergic agonist and alpha adrenergic receptor antagonist *[11]* these methods are essentially meant to restore normal position and adequate support for the vesico-urethral segment the hypermobility, lowering of the position or both are consistently believed to be the reason for SUI. Initially Burch colposuspension was regarded as the gold standard *[12]* for surgical correction of SUI until in 1996 Ulmsten introduced the tension-free vaginal tape(TVT) procedure *[13,14]*. Due to encountered complications of vascular injuries and bowel perforation with TVT, Delorme in 2001 described the TOT insertion *[15]*. By this method, the complications encountered in TVT were avoided *[16]*. There is no doubt therefore that, it is still too early to assess the long term outcome of surgical treatment of SUI with the meshes. A lot of data regarding the long time complication of such surgery that relates to the use of meshes still needs to be collected *[17]*. The objective of this study is to evaluate the efficacy of surgeon-tailored (hand-

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made) propylene mesh used in TOT for female stress urinary incontinence(SUI) in a low income country.

Methods

Retrospective analysis of data of twenty one patients underwent TOT at Effia Nkwanta Regional Hospital and Madamfo Specialist Hospital both in the Western Region of Ghana from 2013 to 2016 following clinical and investigative diagnosis of Stress Urine Incontinence (SUI). Preoperative data included history of presenting complaints, past medical, surgical and obstetric and gynaecological history. This was followed by physical examination and assessment of incontinence using Bonney's test. Base line laboratory investigations included full blood count, routine urine examination, urine culture and renal function tests. Additionally, urodynamic tests assessing the cystometric pressure, noting and detrusor instabilities, Valsalva Pressure Leak Point (VPLP).To measure the VPLP, a transducer is inserted into the bladder for the purpose of infusing the bladder with normal saline at room temperature and another into the rectum to measure abdominal pressure. The urethral transducer is removed when patient had the first desire to micturate. Patient was asked to increase the abdominal pressure by a Valsalva manoeuvre. The lowest abdominal pressure detected in the absence of detrusor contraction leading to a loss of urine is the VPLP. Ultrasonography(B.K Facon, 3.5 MHz convex probe used) done for every patient and post void residual urine measured. None of the patients had pelvic floor exercises due to the absence of a specialist physiotherapist. No patient had a neurogenic bladder. None were diabetic. TOT sling procedure was done for all of them using a surgeon tailored (hand-made) propylene mesh 1.5 cm in width and 30cm long threaded on a coma needle *(Fig 1 and Fig 2).* Patient was then given one gram of ceftriazone intravenously. Patient had spinal anaesthesia and place in exaggerated lithotomy position with legs padded and in stirrups. Patient was then catheterized with a retaining two-way Foley's catheter. Bladder emptied. A pull on the catheter helps determine the position of the bladder neck. The point of projection of the obturator membrane is determined by drawing two vertical lines at the lateral edge of each labia and a horizontal line at the base of the clitoris. The intersections of these lines become the point of entry of the coma needle. A 1.5 cm incision of the vagina wall is made about 1cm from the meatus proximally. Dissection continues until the vaginal wall is lifted. By blunt dissection with the finger until the Ischio pubic rami is felt with the index finger whilst protecting the urethral and bladder. The coma needle is inserted by piercing at the earlier predetermined points *(Figure 3)* it is rotated and guided with the finger through the incised vaginal wall *(Figure 4).* A strip of propylene mesh of diameter 1.5 cm is threaded on the coma needle and pulled out *(Figure 6).* A similar procedure is carried out on the other side. The mesh was adjusted by pulling on either side simultaneously whilst keeping a Kelly clamp forceps between the tape mesh *(Figure 5).* This ensured that the tape was tension –free and not in contact with the urethra. The tape is cut just beneath the skin incisions in the groin. Skin incisions closed with a stitch. The vaginal wall incision is closed with a running vycry 2/0 suture and vagina packed with gauze moistened with iodine which is removed the next day. Patient was discharged the next day after successfully voiding and advised to avoid sexual activity foe 4-6 weeks. Follow ups were done on the 3rd and 6th month then a year postoperatively. Symptoms of lower urinary tract dysfunction such as poor stream, feeling of incomplete voiding, frequency, urgency were assessed. Additionally, Bonney's test, and ultrasound to measure post void residual urine were done. By verbal interaction, patients' satisfaction was assessed and grade as excellent, very good, good and poor.

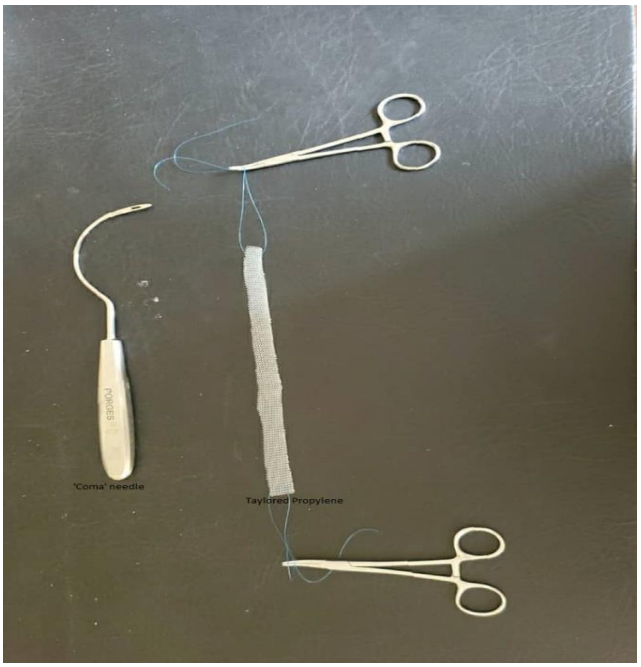

Figure 1: Fashioned propylene mesh

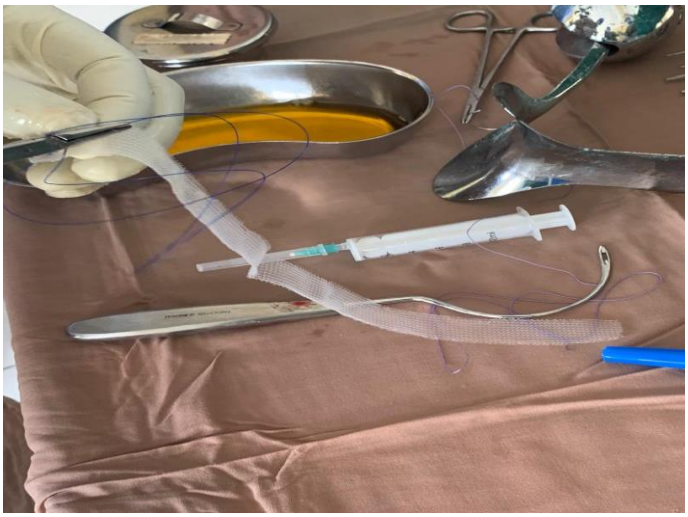

Figure 2: Threading propylene mesh on draped table.

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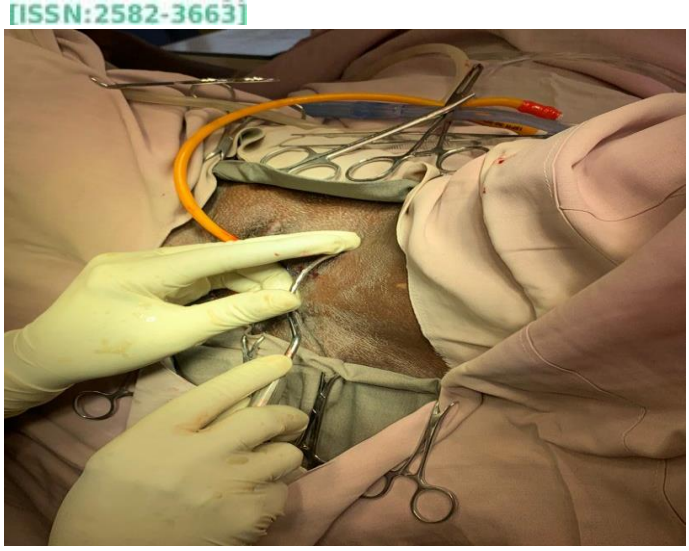

Figure 3: Coma needle inserted into incision

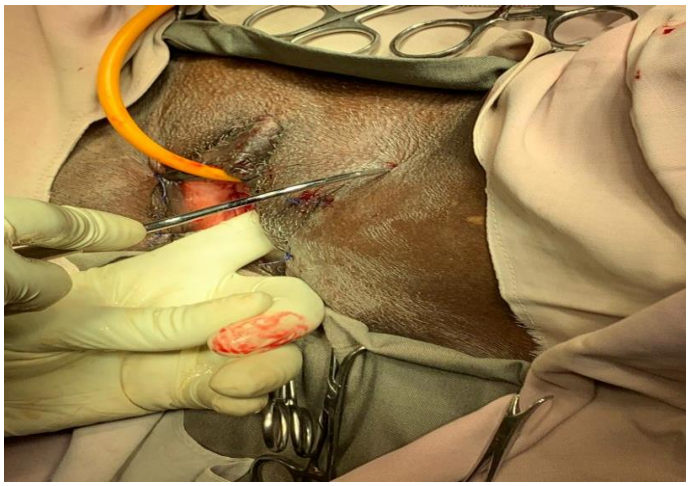

Figure 4: Coma needle rotated through obturator foramen into vagina incision.

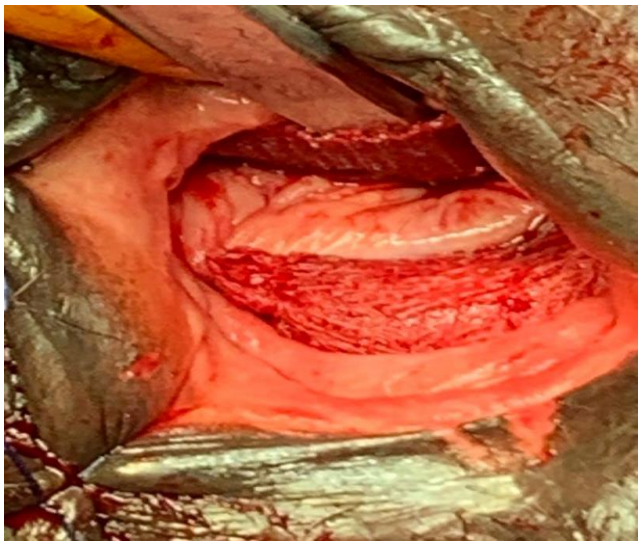

Figure 5: Mesh in place

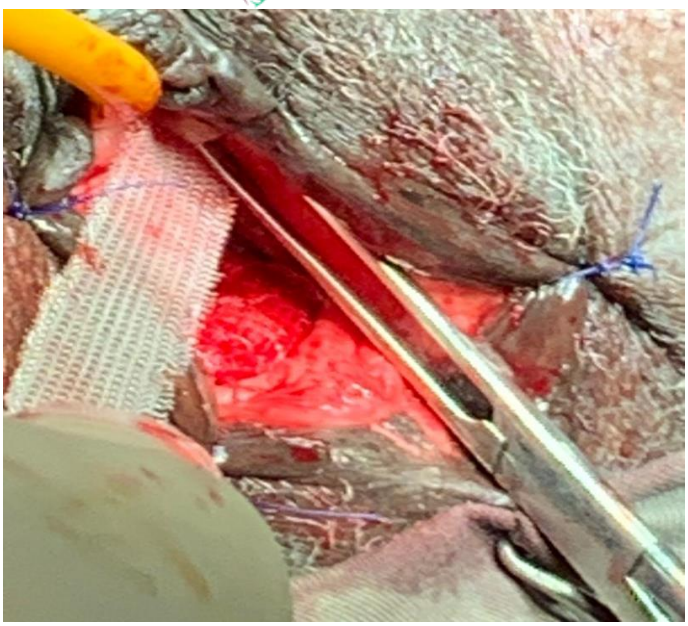

Figure 6: Placing mesh(being pulled out)

Results

Duration	Number
<1 year	8
1-5 years	7
6-10 years	5
>10 years	1

Table 1: Duration of involuntary leakage of urine

Age(in years)	Number (%)
<or=30	2(10)
31-40	11(52)
>40	8(38)

Table 2: Age

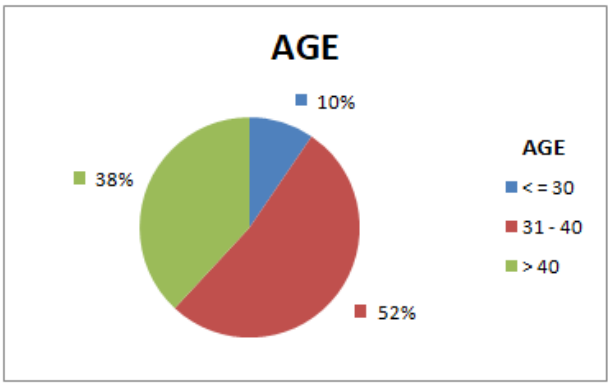

Chart 1: Parity

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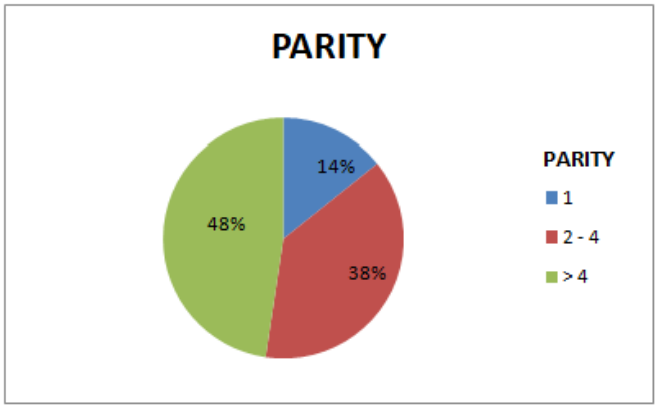
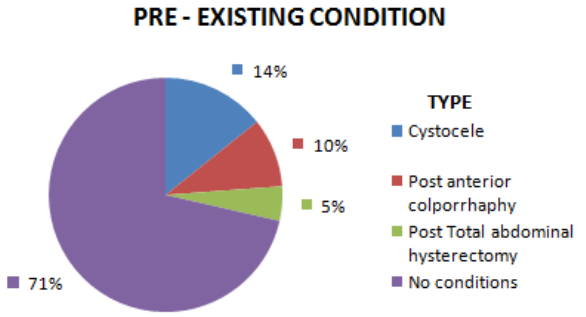


Type	Number (%)
Cystocele	3 (14)
Post anterior colporrhaphy	2 (10)
Post Total abdominal hysterectomy	1 (5)
No conditions	15 (71)

Table 3: Pre-existing



Type	Result	Number (%)
Urine R/E	NAD	13 (61.9)
	UTI	8 (38.1)
BUE&Cr.	Normal	18 (85.7)
	Abnormal	3 (14.2)
Urodynamic Studies	Type I SUI	20 (95.2)
	Type II SUI	1 (4.8)
Ultrasound	No residual urine	21 (100)

Table 4: Results of investigations
NAD- No abnormalities detected.
UTI- Urinary tract infection.

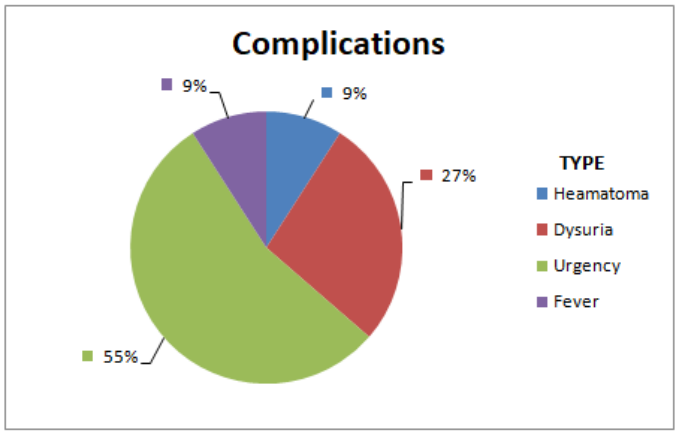


Chart 2: Complications

Result	Number (%)
Completely continent	21(78)
Continent but with mild LUTS	6(22)
Incontinent	0 (0)

Table 5: Postoperative results at 3 months

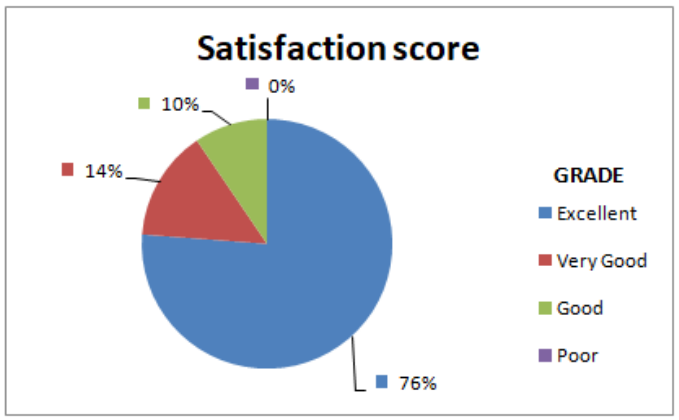


Chart 3

Discussion

In the study, 21 patents with chief complaints of involuntary leakage of urine on coughing, laughing or mild exertion had transobturator tape inserted for correction of SUI between 2013 and 2015 in two hospitals in the Western Region of Ghana. A surgeon tailored propylene mesh was used in place of Malex. 18(85.7%) patents were multiparous *(Chart 1)* (had more than one vaginal delivery). 11(52.0%) of them between the ages of 31-40 years *(Table 2)*. 15(71.4%) of them had no pre-exiting conditions. Three (14.3%) of them had a cystocelle, two (9.5%) patients had anterior colporrhaphy and one total abdominal hysterectomy. 20(95.2%) of patients had normal cystometric and urethral pressure profile measurements. No patent had any

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post void residual urine volume as measured by ultrasound. Eight (38.1%) of the patients had urinary tract infection. All patients had a follow up at the end of the 3rd month, 6th month and finally after one year. On discharge, one patient had hematoma, 3 had dysuria and 6 had urgency. At the end of the third month, all patients were continent but 6 of them had mild urinary tract symptoms of urgency which disappeared by the 6th month *(Table 5)*. In this preliminary report, the cure rate is better than as reported by other researchers *[14]* of a 1-year cure rate of 84%. Assessment of satisfaction of the patients after 6 months of follow up was done verbally. Grading was as follows: Excellent, Very good, Good and poor. 16(76.2%) of patients gave and excellent grade. There was none who grade poor *(Chart 3)*. Only three patients showed up for one year follow up. They had no complaints. There were no intraoperative complications or injury in these patients as compare to other studies *[18]*. Our results albeit the smaller number were better than the study *[19]* which had a follow up of one and a half years. In making a choice of the various materials used in slings, cost was one of most important factors in the well-defined criteria mainly in countries with limited health resources *[20]*. Studies have shown that results obtained with the use of hand-made propylene mesh and those of the commercial synthetic sling system (Boston Scientific Products) are similar *[21]*. The estimated cost of material used was approximately fifteen US dollars ($15) whilst that of the hand-made mesh is about three US dollars ($3). The use of the hand-made mesh would significantly bring the cost down. Our limitation here was our inability to use the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) due to low level of literacy of our patients. We graded satisfaction by simple questions.

Conclusion

The preliminary report shows that the use of simple, inexpensive hand-made propylene mesh for TOT appears to be effective.

Conflict of Interest

None

Permission to extract data given by hospital authorities.

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