

AIM OF THE WORK

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The aim of the study is to assess the efficacy, outcome and complications of the rolled fortified vaginal flap (RFVF) operation in the treatment of stress urinary incontinence (SUI) in females with Intrinsic Sphincter Deficiency (ISD) admitted to the Genitourinary Surgery Department at Alexandria Main University Hospital.

**PATIENTS
AND
METHODS**

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Study design

A prospective study design was utilized to conduct this research. This design allows identification of the outcome of the adopted intervention and provides an opportunity of studying the factors affecting this outcome. Apart from studying past records which suffers from data missing; the adopted design provides less bias through standardization of the intervention as all the operative interference was performed by or under the supervision of one expert.

Study setting

This study was carried out in the Urology Department, Main University Hospital, Alexandria.

Target population

The target population of this study were female patients suffering from Stress Urinary Incontinence (SUI) due to Intrinsic Sphincter Deficiency (ISD) admitted to the Urology Department, Main Alexandria University Hospital. All females with this diagnosis presenting in the Urology Department starting from March 2013 were included. Cases were sequentially included to fulfil the required number (20 patients). Patients were followed for 6 months after the operation through periodic visits to the department to detect any complications or complaints related to the operative interference.

Exclusion criteria: female cases with clinical Overactive Bladder (OAB) and/or pelvic organ prolapse (POP).

Study tools

I- Pre-operative evaluation

All patients were submitted to:

- History taking including personal and family history, socio-demographic characteristics, clinical symptoms, medical history, obstetric history and history of prior surgical operation.
- Patient questionnaire using the Arabic version of the International Consultation on Incontinence Modular Questionnaire - Urinary Incontinence - Short Form (ICIQ-UI-SF) which is a 4 item questionnaire; collecting data about frequency, urine leak and factors leading to this leak as well as questions about patient's quality of life (QoL) and how these urine symptoms are interfering with everyday life activities. 3 of the 4 questions are related to the frequency and severity of UI and 1 related to the impact on the QoL. Then the first 3 questions are summed together in a single summed score (range 0-21). There wasn't any development of a cut off value for the severity of symptoms, so based on statistical analysis a significant difference between the sum of the questions pre- and post-operative was taken as an evidence of improvement. ^{(42,43)(Appendix 1)}
- Clinical examination in the form of abdominal examination and vaginal examination for detection of any pelvic organ prolapse (POP) and evaluation of pelvic muscles' tone. Vaginal examination; inspection for scars, vaginal rugosa, estimation of the degree of urethral hypermobility while the patient is straining. Palpation for evaluation of the

degree of pelvic organ prolapsed and evaluation of the tone of the pelvic floor muscles through asking the patient to squeeze the vagina. Muscle strength is evaluated as strong, weak or absent.

- Special tests to detect SUI in the form of:
 - a) Cough stress test: the test was performed with a half full and full bladder in the supine position and while standing. Leakage spurt should coincide with the duration of cough. Any presence of leak afterwards denotes the presence of cough induced bladder overactivity.
 - b) Q tip test: to detect the degree of urethral hypermobility; elevation of the Q tip more than 30 degrees from the horizontal is considered positive.
 - c) Routine laboratory investigations: complete urine analysis, complete blood count (CBC), coagulation profile, urea and creatinine.
 - d) Urodynamic Study:
 - i. Uroflow: a free flow rate was done to implement the "Bladder outlet obstruction nomogram".
 - ii. Filling cystometry was done to detect degree of VLPP starting from 150 ml bladder capacity and asking the patient to strain gradually till leak could be detected. If negative the test is then repeated at higher bladder capacity. Bladder capacity, compliance, sensations and detrusor over-activity were also assessed.

Urodynamic studies were performed using a standardized urodynamic technique with different urodynamic units (Andromeda). A 6 Fr dual lumen urethral catheter was used to fill the bladder and record the bladder pressure. A balloon catheter was inserted into the rectum for recording abdominal pressure. The pressure transducers, zeroed to atmosphere, were levelled to the upper edge of the symphysis pubis and connected to the pressure lines using water filled catheters.

During cystometry, the bladder was filled with saline. The filling rate was 50 ml/min at room temperature. Patients were filled sitting and voided in the sitting position. Assessment of detrusor overactivity waves as well as urodynamic stress urinary incontinence was carried out during the filling phase through recording the vesical (p_{ves}) and abdominal pressures (p_{abd}).
 - iii. Pressure flow study was also done to detect bladder outlet obstruction. This was done through applying "Bladder outlet obstruction nomogram". The nomogram depends on measuring free Q_{max} and Max Pdet. Urinary obstruction is classified into three stages namely; mild, moderate and severe.^(44,45)

During voiding, urine flow, bladder and abdominal pressures were recorded. Flow was measured using a weight transducer flow-meter.

II- Operative technique

Rolled Fortified Vaginal Flap (RFVF) procedure was performed for all patients by or under supervision of the same surgeon. The procedure was done under spinal anesthesia in the dorsal lithotomy position.

A urethral catheter is inserted to keep the bladder empty at all times, after that a weighted speculum is used to retract the vaginal tissue. A rectangular anterior vaginal wall flap is fashioned such that the top of the flap is approximately 2 centimeters below the urethral meatus (Fig. 16) and the bottom of the flap is extended towards the bladder neck (Fig. 17) (determined by Foley balloon location).

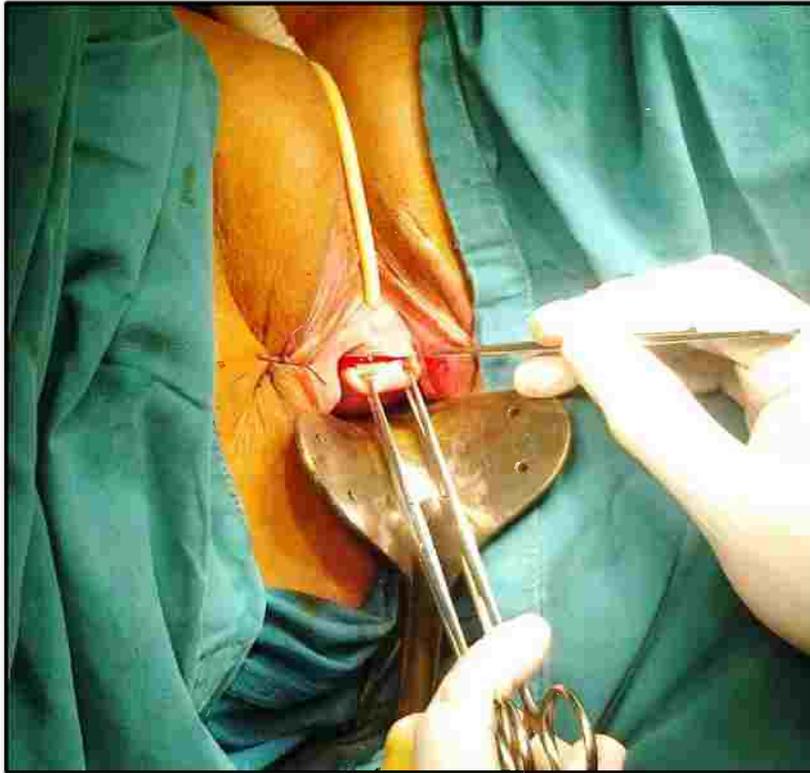


Figure (16): Fashioning the top of the flap 2 cm below the urethral meatus.

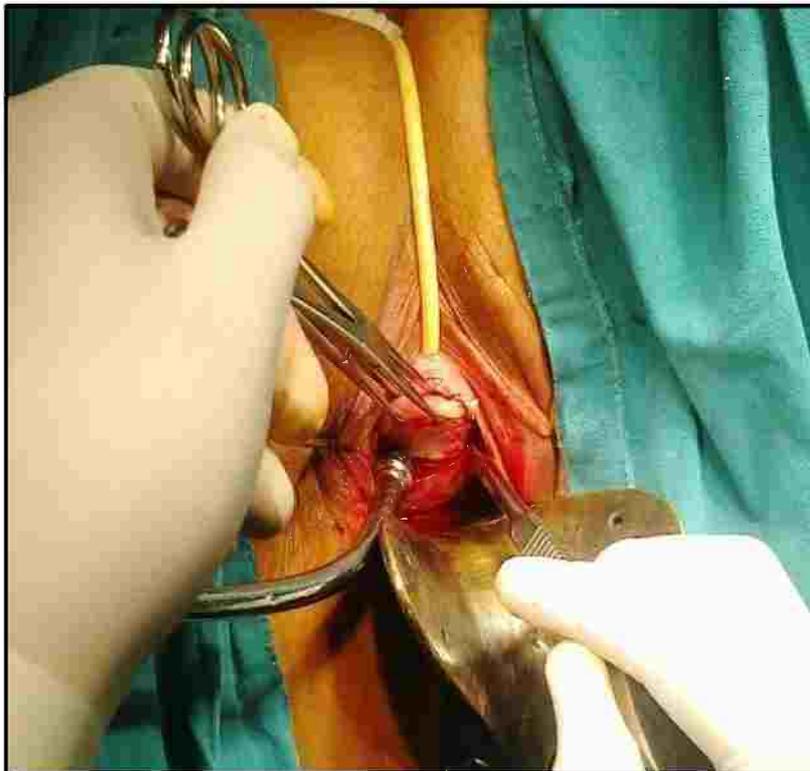


Figure (17): Fashioning the bottom of the flap towards the bladder neck.

A No. 15 blade knife is used to carry this incision down through the vaginal epithelium, with care to stay above the periurethral and pubocervical fascia (to avoid bleeding and injury to the urethra and bladder). With an Allis clamp and Metzenbaum scissors, thick vaginal epithelial flaps are created. (Fig. 18)

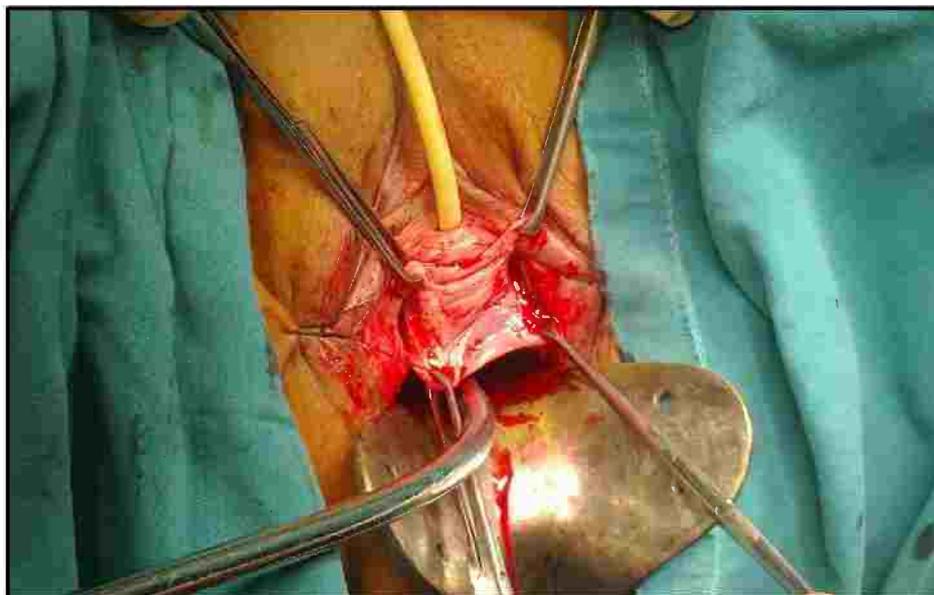


Figure (18): Rectangular flap is fashioned.

Once adequate lateral flaps have been created and the ischiopubic rami are easily palpated, it is appropriate to perforate the endopelvic fascia. With the tips of the Metzenbaum scissors pointed upward and to the ipsilateral patient's shoulder, the endopelvic fascia is perforated by remaining directly medial and immediately under the ischiopubic ramus at the superior margin of dissection. Perforation occurs in a superolateral direction, and the dissecting scissors are spread widely to aid in dissection (Fig. 19). With the use of blunt finger dissection, the retropubic space is dissected bilaterally. This dissection leads to the connection between the infrapubic and retropubic dissection planes. Simultaneous finger palpation from abdominal and vaginal incisions should be possible, while gently palpating the bladder medially. The dissection plane into the retropubic space should be immediately adjacent to the periosteum of the pubis, and the dissection should be performed only sharply to minimize risk of injury to the pelvic viscera.

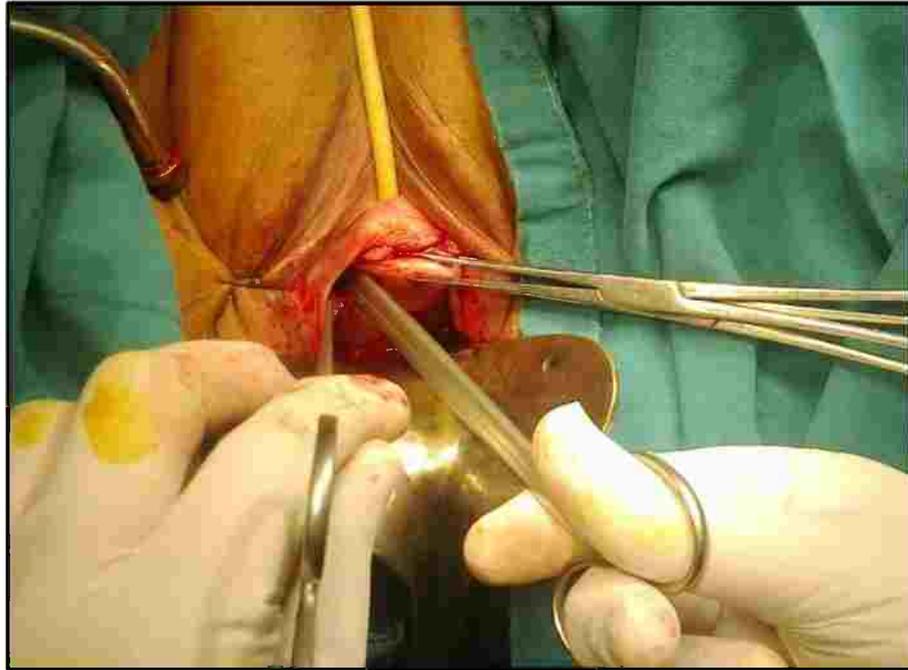


Figure (19): Perforation of the endopelvic fascia by Metzenbaum scissors.

After fashioning of the flap, cauterization of the surface of the vaginal flap is done to avoid development of inclusion cysts (Fig. 20), this is followed by placement of two diagonal rows of zero prolene sutures to further fortify the flap (Fig. 21). The next step is enrolling of the flap in order to double the layer of vaginal wall support. The rolled flap is now suspended by two threads from either side (Fig. 22) in preparation to be passed into the suprapubic region; this is done by the passage of Stamey needles from above through two abdominal incisions done at the lower abdominal crease each about half a centimetre. Passage of the needles is done through contact with the pubis throughout until brought out lateral to the bladder and through the vagina guided by the index finger (Fig. 23). The ends of suture are passed through the Stamey needle eyelets (Fig. 24), then the Stamey needles are removed and the ends of the suture are brought out through the abdominal incision and tagged with hemostat clamps. Each end of the threads is passed separately to the suprapubic region to allow them to be tied over the rectus fascia for further support (Fig. 25). Before tying the threads over the rectus sheath, the vaginal incision is closed with a watertight, running 2-0 Vicryl suture (Fig. 26).

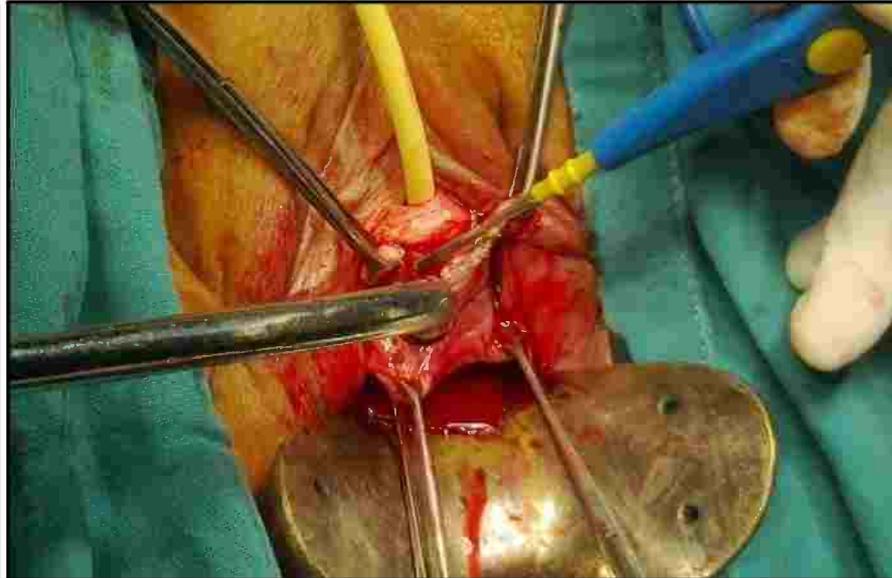


Figure (20): Cauterization of the surface of the vaginal flap.

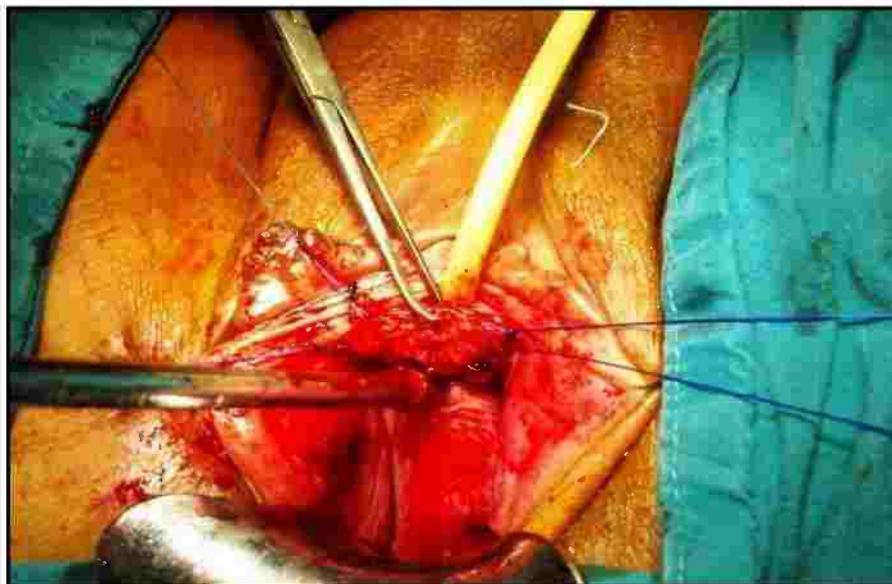


Figure (21): Placement of two diagonal rows of zero prolene suture.

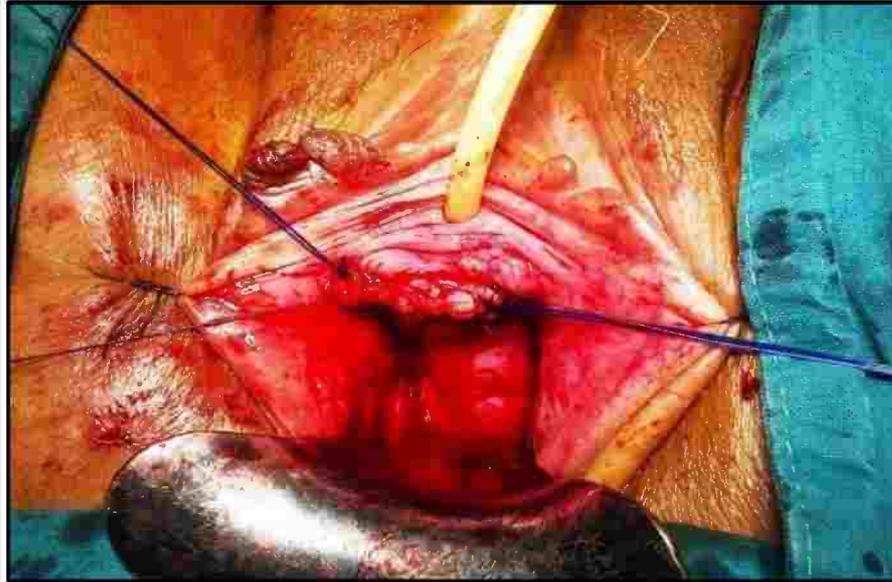


Figure (22): Suspension of the rolled flap by two threads from both sides.

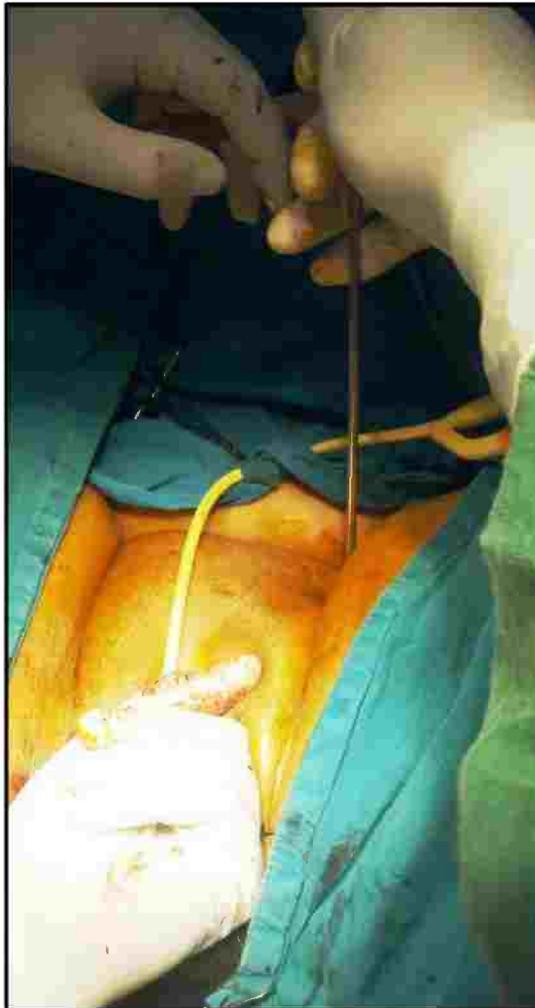


Figure (23): Passage of the Stamey needle through the suprapubic area guided by the index finger.

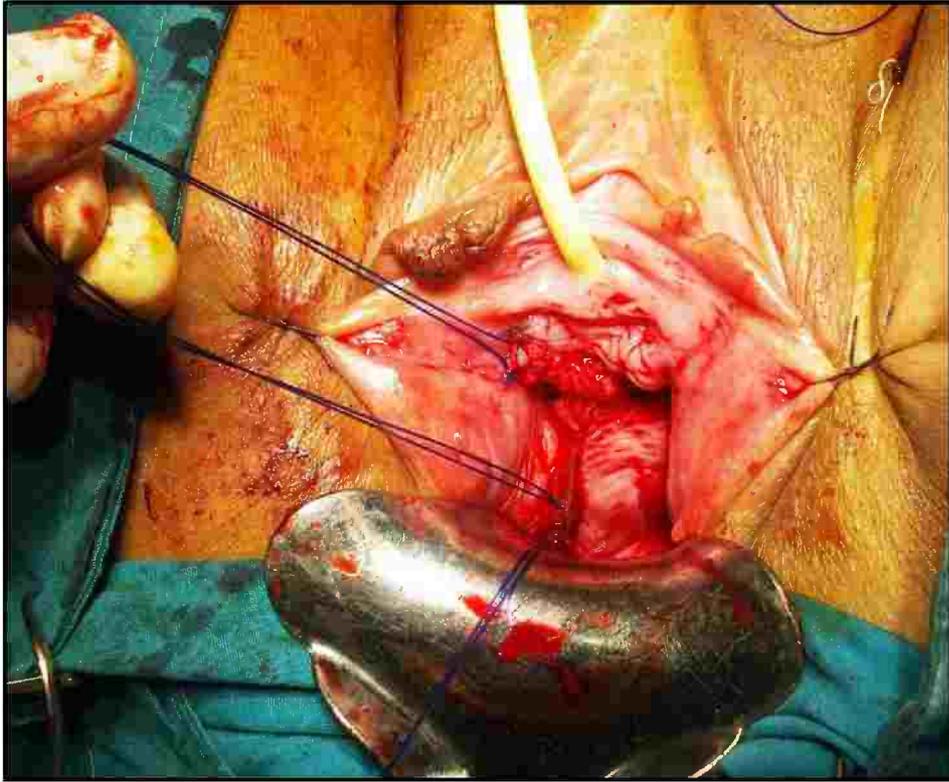


Figure (24): Passage of the end of the threads through the Stamey Needle eyelets.



Figure (25): Tying the threads over the rectus sheath.

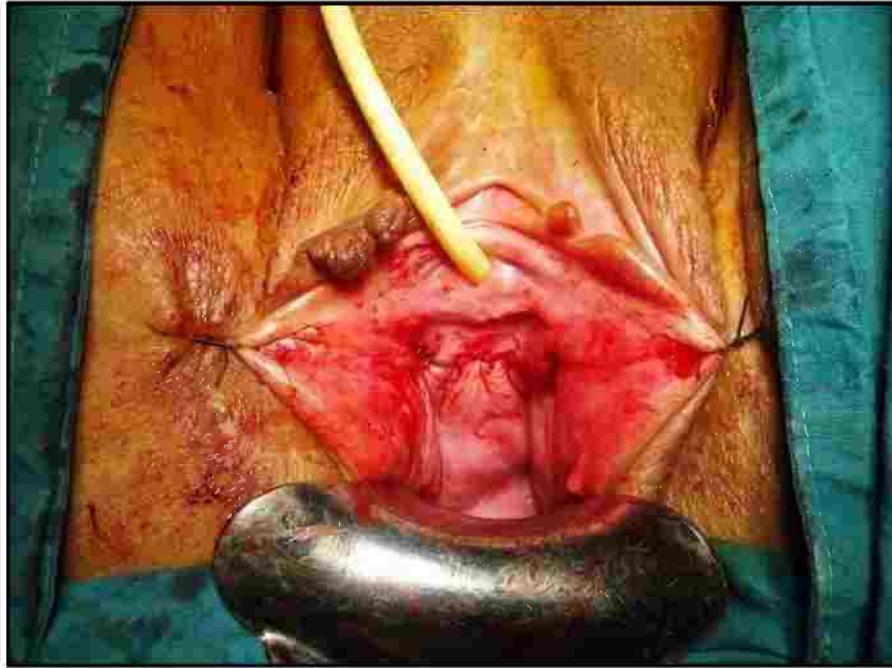


Figure (26): Closure of the vaginal incision.

The two abdominal incisions are closed using one 3-0 polyglactin suture and the vagina is packed by gauze soaked in betadine that is removed together with the Foley catheter after 24 hours.

The operative period was covered by antibiotic prophylaxis in the form of quinolones and metronidazole. This was continued for 5 days in the post operative period. The urethral catheter and the vaginal pack were removed 24 hours post-operatively at which the patient was given a trial without catheter then the patients were discharged. Minimal analgesic requirement were encountered during the hospital stay.

III- Post-operative follow up protocol

- A) Assessment of the duration of the hospital stay and analgesic requirements for each patient.
- B) Patients were followed up 1 month and 6 months post-operatively.
- C) In each visit; patients were subjected to assessment of the outcome:
 - 1- Subjective outcome: this was done through history taking and filling of the ICIQ-UI-SF.^(42,43)
 - 2- Objective outcome: by performing examination, cough stress test, urodynamic studies and effect on sexual life.
- D) Success was defined as being dry at the 6 months follow up period.

IV- Data management

Revision of the collected data was routinely carried out. Data were fed to the computer using Statistical Package for Social Science (SPSS, version19). Possible entry errors were checked for by a serial range, minimum and maximum values as well as frequency distribution and cross tabulations to ensure that all questions had valid codes and values.

Data analysis

Simple descriptive statistics as frequency and percentage distribution for categorical variables and mean with the standard deviation for quantitative variables were used. The median was also calculated for all scores and none normally distributed variables.

For comparative purposes, paired t-test was utilized to compare pre- and post-quantitative variables. Friedman test was utilized to compare pre- and post-operative QoL score variables measured more than two times. Kendall's test was utilized to measure pre- and post- qualitative variables. For comparison between pre- and post- operative findings analysis was initially carried out based on a series of univariate comparisons. Appropriate inferential statistics was done with ≤ 0.05 level of significance.

Ethical considerations

All the necessary approvals for carrying out the research were obtained. The Postgraduate and Ethical Committee of the Faculty of Medicine, Alexandria University approved the research. The purpose and importance of the research findings as well as the recommendations and their future impact were clarified to the patients. A written informal consent explaining the purpose of the research was prepared and signed by the participants after explaining the aim and procedures of the study and before filling the questionnaire. An oral consent for participation was obtained from illiterate patients. Complete confidentiality was ensured. Participants' right to withdraw from the study whenever they want without affection of their long term care plan was also ensured.

The following Gantt chart (1) illustrates the various activities performed in months during the study phases.

Chart (1): Activities of the study

Activity	Month												
	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-
Preparatory Phase													
Preparation of study protocol	■												
Developing study tools	■	■											
Implementation Phase													
Data collection			■	■	■	■	■	■	■				
Follow up of cases				■	■	■	■	■	■	■			
Data entry							■	■	■	■			
Data management									■	■	■		
Data analysis											■		
Thesis writing and revision							■	■	■	■	■	■	■
Submission of thesis													■

RESULTS

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Twenty female patients complaining of Stress Urinary Incontinence (SUI) due to Intrinsic Sphincter Deficiency (ISD) were recruited in this study. Table (1) shows obstetric, medical and surgical history of studied women. Age ranged from 20 to 58 years with a mean of 43.00 ± 8.74 . Gravidity ranged from 1 to 8 with a mean of 3.80 ± 1.82 , while parity ranged from 1-6 with a mean of 2.85 ± 1.13 . Those suffering from abortion constituted 45% of studied women. All of the studied women had at least one normal delivery, while three of them were subjected to caesarean section. Only two women suffered from hypertension (10%) and another two (10%) suffered from diabetes mellitus. Enquiring about surgical operation revealed that one woman (5%) had vaginal tape and another one had total hysterectomy.

Table (1): Findings of obstetric, medical, and surgical history of studied women.

Serial	Age	Gravidity	Parity	Abortions	Delivery mode	Medical history	Surgical history
1	40	3	3	0	N	Free	Free
2	54	4	3	1	N	Hypertension	Cholecystectomy
3	46	3	3	0	N	Free	Vaginal tape
4	34	2	2	0	N	Free	Free
5	43	2	2	0	N	Free	Cholecystectomy
6	46	2	2	0	N/C*	Free	Free
7	25	2	2	0	N	Free	Tonsillectomy
8	45	4	3	1	N/C	Free	Hysterectomy
9	45	5	5	0	N/C	Free	Free
10	41	8	2	6	N	Free	D&C
11	42	8	6	2	N	Free	PUH repair
12	20	1	1	0	N	Free	Free
13	42	5	2	3	N	Free	Free
14	50	5	2	3	N	Free	U fibroid Excision
15	48	3	3	0	N	Free	Free
16	41	4	4	0	N	Rheumatic	Carpal tunnel S
17	58	4	3	1	N	Free	Free
18	44	4	3	1	N	Hypertension	Free
19	49	3	3	0	N	Diabetes	Cholecystectomy
20	47	4	3	1	N	Diabetes	Free
Mean	43.0	3.80	2.85	0.95			

*N= Normal vaginal delivery.

*C= Cesarean section delivery.

All studied women had a positive cough test with half full and full bladder capacity. Cough stress test was performed at the supine and standing position. Women with positive urethral hypermobility constituted 45% (9 women) of the studied women while the rest (55%) had a negative urethral hypermobility.

Table (2) outlines the correlation between ISD and gravidity, parity & mode of delivery. Mean while, gravidity, parity and mode of delivery were statistically insignificant.

Table (2): Relation between urethral hypermobility and gravidity, parity and mode of delivery among women with stress urinary incontinence.

Factors	ISD	Combined ISD & urethral hypermobility	Test
Gravidity (pregnancies)			
Mean \pm SD	3.91 \pm 1.58	3.67 \pm 2.18	0.350# (0.726)
Parity (deliveries)			
Mean \pm SD	2.82 \pm 0.60	2.89 \pm 1.62	0.693# (0.488)
Mode of delivery			
Vaginal	9 (81.8%)	8 (88.9%)	[1.00]
Caesarean	2 (18.2%)	1 (11.1%)	

* Significant, $P \leq 0.05$

Mann Whitney test

[] Fisher exact test

Preoperative urodynamic findings of studied women are presented in Table (3). All patients had a +ve cough stress test. Valsalva leak point pressure (VLPP) ranged from 20 to 60 cmH₂O with a mean of 50.05 ± 11.27 cmH₂O and a median of 53.5. This was done at a bladder volume of 200 ml.

Filling cystometry done 1 month post-operatively revealed that only two patients (10%) demonstrated stress incontinence during the urodynamic test only with a positive cough stress test at sitting and standing positions with a half full and full bladder. The VLPP for these patients was 106 cmH₂O at bladder volume of 250ml and 97 cmH₂O at a bladder volume of 300ml. Those 2 patients continued to leak at the 6 months follow up during the cough stress test and filling cystometry. The VLPP was still high at 102 cmH₂O at a bladder volume of 250 ml and 99 cmH₂O at a bladder volume of 300ml. A third patient had persistent stress urine incontinence postoperatively and the decision was to readjust the hanging sutures at an early post operative period of 1 week to avoid formation of fibrosis. This patient didn't demonstrate any leak on cough test or urodynamic testing at the 1 and 6 months follow up period.

Table (3): Preoperative urodynamic findings of studied women.

Serial	Valsalva leak point pressure(cm H₂O)
1	50
2	40
3	35
4	60
5	32
6	45
7	60
8	42
9	20
10	58
11	60
12	59
13	57
14	53
15	52
16	59
17	60
18	58
19	54
20	47
Mean	50.05
SD	11.2
Median	53.50

The VLPP was done at bladder volume of 200 ml.

Table (4) shows Qmax measured during pressure flow study of studied women preoperatively, 1 and 6 months follow up. The mean Qmax preoperatively was 22.85 ml/s that decreased to 22.28 ml/s at 1 month and again decreased to a mean of 21.61 ml/s at 6 months follow up at 6 months. This decrease was neither clinically nor statistically significant (P=0.115).

Table (4): Q max of studied women preoperatively and at 1 and 6 month postoperatively.

Serial	Pre-operative	1 month	6 months
1	19.5	18.7	17.6
2	19	19.3	21.1
3	20	20	18.8
4	23	22.4	21.2
5	26	24.7	23.3
6	26	25.4	24.4
7	28	27	25
8	27	24	23.3
9	15	15	15.1
10	16	16	15
11	27	26.3	26.4
12	25	22.4	21.3
13	20	19.7	18.8
14	24.5	24.8	25
15	22	21.2	22.1
16	21	23	22
17	27	27	26
18	27	23.7	22
19	27	25	26.3
20	20	19	18
Mean	22.85	22.23	21.61
SD	3.89	3.51	3.47
Median	25.50	22.70	21.65

Friedman Chi square = 4.33, P =0.115

Tables (5) and (6) are showing the Free Qmax and the Max Pdet of studied women preoperatively, 1 and 6 months follow up. The mean pre-operative value of Qmax was 28.25 then decreased to a mean of 27.05 at 1 month and 26.94 at 6 months follow up. This decrease was neither clinically nor statistically significant (P=0.056). The mean preoperative Max Pdet was 32.48 cmH₂O, this then slightly increased to a mean of 32.85 cmH₂O at 1 month follow up and then slightly decreased to a mean of 31.17 at 6 months follow up. The change in pressure between the preoperative period and the follow up period was statistically insignificant (P = 0.187).

Table (5): Free Qmax of studied women preoperatively and at 1 and 6 month postoperatively.

Serial	Pre-operative	1 month	6 months
1	24	23	25
2	25	24	26
3	22	24	25
4	26	26	27
5	29	27	28
6	30	30	28.7
7	34	32	29
8	28	28	28
9	23	20	23
10	21	22	20
11	33	31	30
12	29	27	26
13	27	25	24
14	34	29	29
15	28	25	25
16	32	30	29
17	35	35	32
18	29	29	28
19	31	29	32
20	28	25	24
Mean	28.25	27.05	26.94
SD	3.95	3.68	3.02
Median	29.00	27.00	27.50

Friedman Chi square = 5.765, P = 0.056

Table (6): Max Pdet of studied women preoperatively and at 1 and 6 month postoperatively

Serial	Pre-operative	1 month	6 months
1	29.5	27	27.3
2	27	25	22
3	28	32	33
4	32	34	33
5	34	33	33
6	28	31	29
7	28	30	29
8	33	34	30
9	30	34	29
10	31	30	26
11	39	37	36
12	35	33	32
13	33	29	29
14	39	39	31
15	30	31	31
16	39	39	33
17	40	41	38
18	35	33	34
19	36	35	38
20	29	30	30
Mean	32.48	32.85	31.17
SD	4.81	4.04	3.88
Median	35.00	33.00	31.00

Friedman Chi square = 3.351, P = 0.187

By using the free Qmax and the maximum detrusor pressure (Max Pdet) during the voiding phase while doing the pressure flow study, the bladder outlet nomogram was formulated. Figure (27) and (28) show the results of the bladder outlet nomogram 1 and 6 months post operative. 5 (25%) of the patients developed transient retention post-operatively. 4 out of those 5 patients (20%) had mild obstruction at 1 month post operatively. Out of the 4 patients who had mild obstruction at 1 month, 2 still had mild obstruction at 6 months.

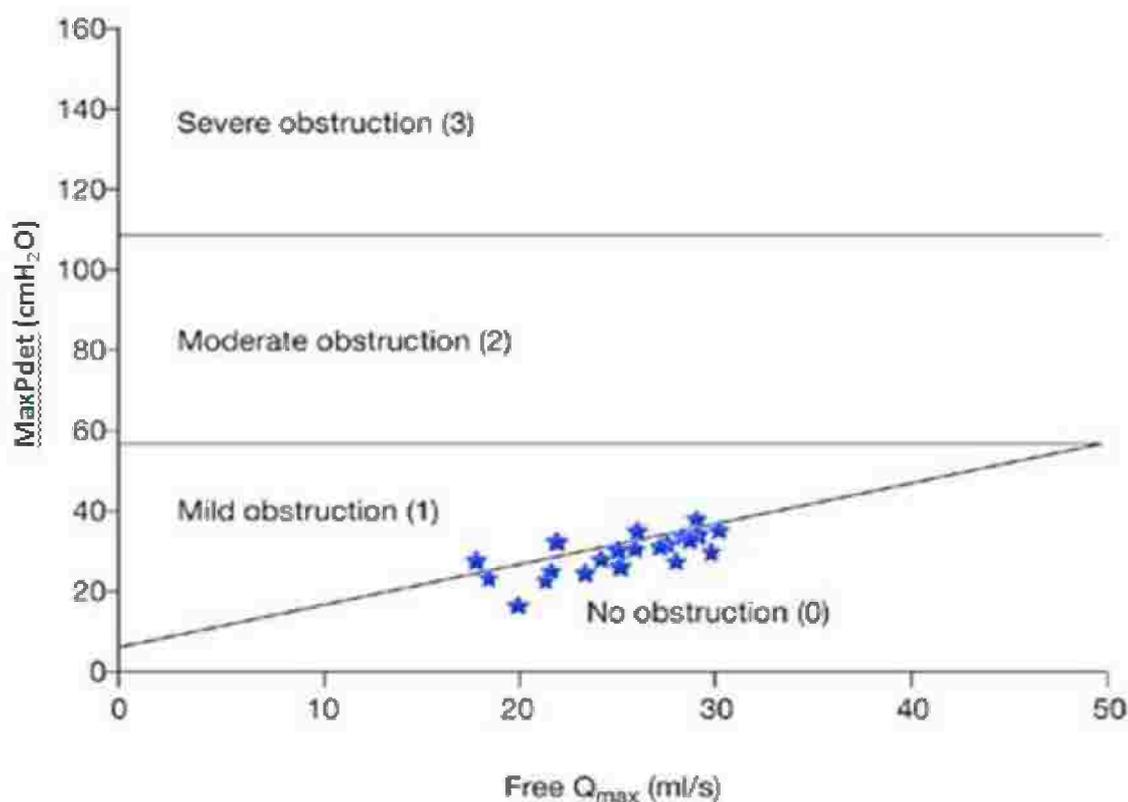


Figure (27): Bladder Outlet Obstruction Nomogram at 1 month follow up showing 4 patients with mild obstruction.

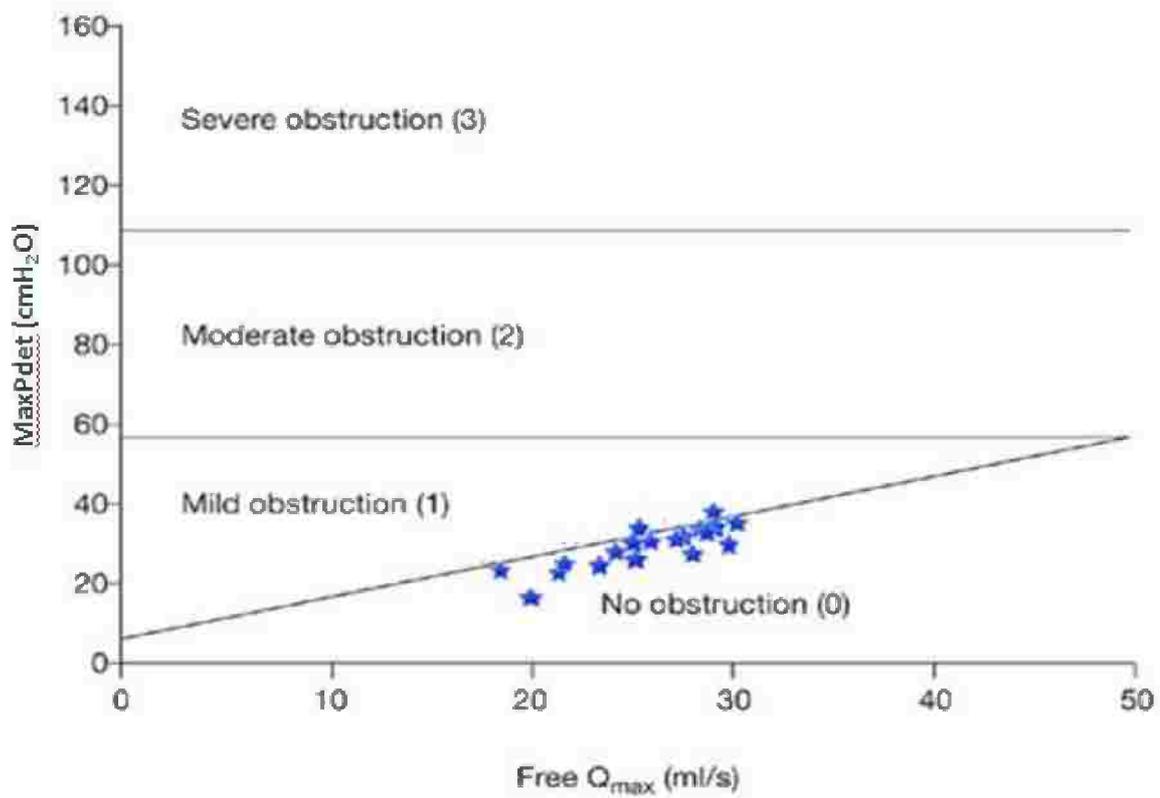


Figure (28): Bladder Outlet Obstruction Nomogram at 6 months follow up showing 2 patients with mild obstruction.

Table (7) and figure (29) illustrate immediate and postoperative complications at 1 and 6 months follow up period. Transient retention of urine was only observed immediately 1 week post operatively among 25% of women that lasted for 1 week and was treated by a catheter insertion, while no women suffered such symptom either after 1 or 6 month of follow up, (P = 0.007). Also UTI showed the same pattern of appearance with only three patients (15%), (P = 0.050). Stress urinary incontinence was observed among three patients (15%) immediately postoperatively and two cases (10%) after one month of follow up while, those 2 patients remained to complain of SUI at 6 months of follow up. None of our patients demonstrated de novo detrusor overactivity or urgency incontinence.

Only one case had persistent stress urinary incontinence immediately post operatively. The decision was taken to tighten the suprapubic sutures under spinal anaesthesia through the previously done suprapubic incisions. This patient didn't demonstrate any stress incontinence at 1 or 6 months post-operatively.

4 patients (20%) demonstrated mild bladder outlet obstruction on urodynamic findings at 1 month follow up. All those patients were asymptomatic and 2 of them (10%) remained to have mild bladder outlet obstruction at 6 months follow up during urodynamic findings but still remained asymptomatic.

Table (7): Immediate post operative complications and at 1 month and 6 months following operative interference of studied women.

	Immediate	1 month	6 months	Kendall's (P)
	n (%)	n (%)	n (%)	
Transient retention	5 (25.0)	0 (0.0)	0 (0.0)	0.007*
SUI	3 (15.0)	2 (10.0)	2 (10.0)	0.368
UTI	3 (15.0)	0 (0.0)	0 (0.0)	0.050*
Readjustment	1 (5.0)	0 (0.0)	0 (0.0)	-

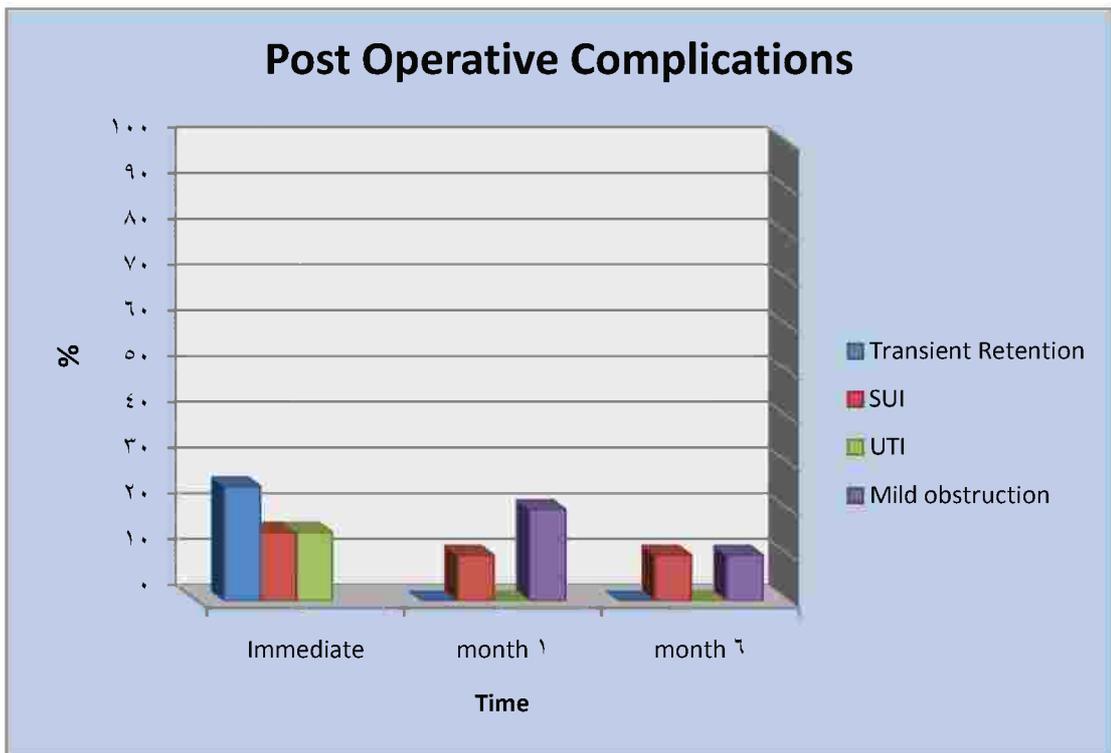


Figure (29): Post operative complications of studied women

Table (8a) and (8b) depicts International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI-SF) findings pre-operatively, 1 month and 6 months postoperatively. Overall, the quality of life of women with urinary incontinence significantly improved following operative interference. Exactly 50% of women suffered from leakage of urine about once a day, while 35% of them suffered leakage of urine several times per day. Only 15% suffered from two of three leakages per week. One month after operative interference, the majority (90%) did not report any leakage of urine while just only 10% reported urinary leakage about once or less per week. At 6 months of follow up the results were similar to those of 1 month follow up. These differences are statistically significant, $P < 0.001$. A similar pattern can be observed also for the amount of urinary leakage as the majority (70%) suffered from a moderate amount of urinary leakage while exactly a quarter (25%) leaked a large amount of urine. After one month of follow up 90% of studied women did not leak while the same findings were noted after 6 months of follow up, $P < 0.001$.

While all women, before carrying out the operative interference reported interference with their everyday life, 90% of them did not report any interference with everyday life after one month of follow up, and 90% still reported no interference after 6 months of follow up. The overall ICIQ-UI-SF score presented in figure (30) decreased from $73.57 \pm 12.015\%$ (preoperative) to $2.62 \pm 8.09\%$ (1 month after follow up) and then maintained at $2.62 \pm 8.09\%$ after 6 months of follow up, $P < 0.001$.

Studying activities / factors precipitating urine leak showed that all women were leaking during coughing or sneezing before operative interference. Also the majority (90%) were leaking during physical activity or exercising. After one month of follow up only 10% were leaking during physical activity or exercising once weekly and this was maintained at 6 months of follow up, $P < 0.001$.

Table (8a): ICIQ-UI findings pre-operatively, 1 and 6 months postoperatively.

ICIQ-UI	Preoperative	1 month	6 months
	n (%)	n (%)	n (%)
How often do you leak urine?			
Never (0)		18 (90.0)	18 (90.0)
About once a week or less often (1)		2 (10.0)	2 (10.0)
Two or three times a week (2)	3 (15.0)		
About once a day (3)	10 (50.0)		
Several times a day (4)	7(35.0)		
All the time (5)			
Mean	3.20 ± 0.70	0.10 ± 0.31	0.10 ± 0.31
Friedman (P)	< 0.001		
How much urine do you usually leak?			
None (0)		18 (90.0)	18 (90.0)
A small amount (2)	1(5.0)	2 (10.0)	2 (10.0)
A moderate amount (4)	14 (70.0)		
A large amount (6)	5 (25.0)		
Mean	4.40 ± 1.05	0.20 ± 0.62	0.20 ± 0.62
Friedman (P)	< 0.001		
Overall, how much does leaking urine interfere with everyday life?			
0 (Not at all)		18 (90.0)	18 (90.0)
1		1(5.0)	1 (5.0)
2		1(5.0)	1 (5.0)
3			
4			
5			
6	2 (10.0)		
7	6 (30.0)		
8	6 (30.0)		
9	5 (25.0)		
10 (Great deal)	1(5.0)		
Mean	7.85 ± 1.09	0.15 ± 0.49	0.15 ± 0.49
Friedman (P)	< 0.001		
ICIQ percent score			
Mean	73.57	2.62	2.62
SD	12.015	8.098	8.098
Median	71.43	0.0	0.0
Friedman (P)	< 0.001		

Table (8b): ICIQ-UI findings pre-operatively, 1 and 6 months postoperatively.

ICIQ-UI	Preoperative	1 month	6 months
	n (%)	n (%)	n (%)
When does urine leak?			
Never – urine does not leak		18 (90)	18 (90)
Leaks before you can get to the toilet			
Leaks when you cough or sneeze	20 (100)		
Leaks when you are asleep			
Leaks when you are physically active/exercising	18 (90)	2 (10)	2 (10)
Leaks when you have finished urinating and are dressed			
Leaks for no obvious reason			
Leaks all the time			

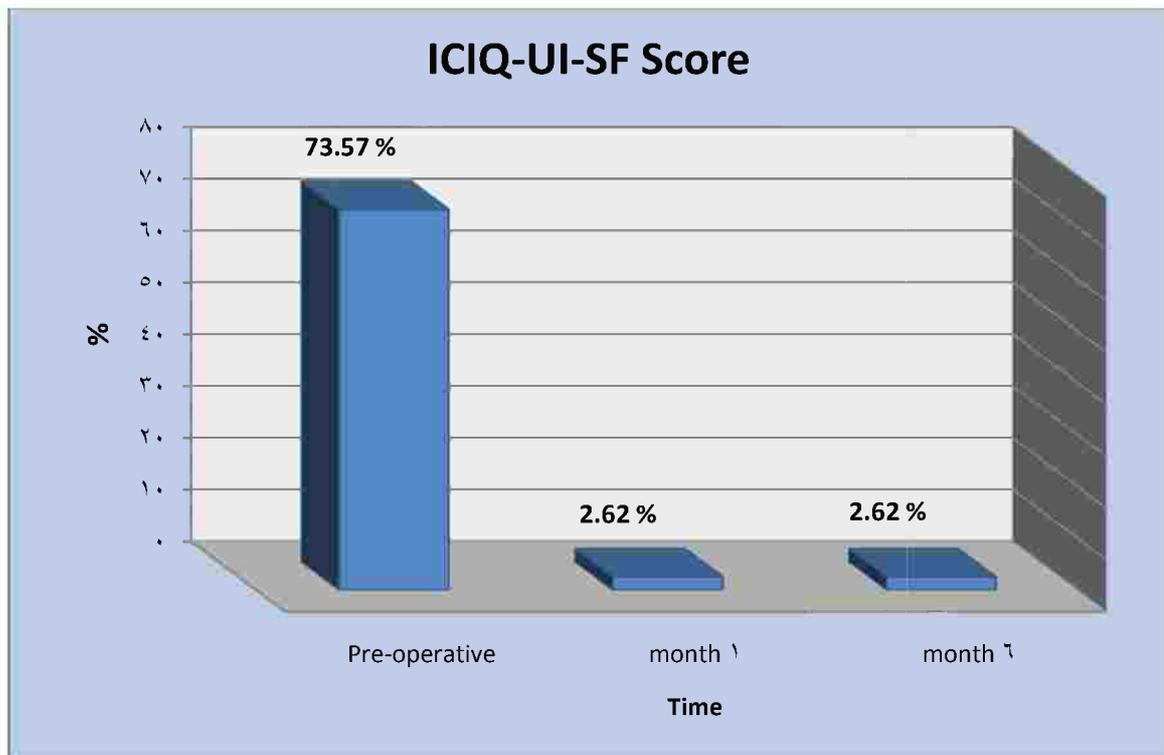


Figure (30): ICIQ-UI-SF percent score pre- and post-operative.