

# RECOMMENDATIONS

## **RECOMMENDATIONS**

1. Longer follow up of patients is recommended to assess the long term endurance of the RFVF.
2. Larger sample size is recommended for a stronger statistical correlation.

# REFERENCES

## REFERENCES

1. Bates P, Bradley WE, Glen E, Melchior H, Rowan D, Sterling A, et al. The standardization of terminology of lower urinary tract function. *Eur Urol* 1976;121:274–6.
2. Abrams P, Cardozo L, Fall M, Gri D, Rosier P, Ulmsten U, et al. The Standardisation of Terminology of Lower Urinary Tract Function : Report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn* 2002; 21: 167-78.
3. McGuire EJ, Lytton B, Kohorn EI, Pepe V. The value of urodynamic testing in stress urinary incontinence. *J Urol* 1980;124(2):256–8.
4. Blavais JG OC. Stress incontinence: definition and surgical approach. *J Urol*. 1988;139:727.
5. Fantl JA, Newman DK CJ. Urinary incontinence in adults: acute and chronic management. Clinical practice guideline No. 2, 1996 update. Agency for Health Care Policy and Research. Rockville: AHCPR publication, 1996.
6. Swift S. Intrinsic sphincter deficiency : what is it and does it matter anymore? *Int Urogynecol J* 2013; 24: 183-4.
7. Sand PK, Bowen LW, Panganiban R, Ostergard DR. The low pressure urethra as a factor in failed retropubic urethropexy. *Obstet Gynecol* 1987;69:399–402.
8. Pajoncini C, Costantini E, Guercini F, Bini V, Porena M. Clinical and Urodynamic Features of Intrinsic Sphincter Deficiency. *Neurourol Urodynam* 2003; 22:264-8.
9. McGuire EJ, Fitzpatrick CC, Wan J, Bloom D, Sanvordenker J, Ritchey M, et al. Clinical assessment of urethral sphincter function. *J Urol* 1993;150:1452–4.
10. Theofrastous JP, Cundiff GW, Harris RL, Bump RC. The effect of vesical volume on Valsalva leak-point pressures in women with genuine stress urinary incontinence. *Obstet Gynecol* 1996;87:711–4.
11. Petros PE, Ulmsten U. Role of the pelvic floor in bladder neck opening and closure I: muscle forces. *Int Urogynecol J Pelvic Floor Dysfunct*. 1997;8:74–80.
12. Petros P. The Integral System. *Cent Eur J ournal Urol* 2011;63:3.
13. Wagenlehner F, Liedl B, Petros P. A simplified biomechanical perspective of the Integral Theory System. *J Pelviperineol* 2012; 31: 101-6.
14. Papa Petros PE, Ulmsten U. Role of the pelvic floor in bladder neck opening and closure II: vagina. *Int Urogynecol J Pelvic Floor Dysfunct* 1997;8:69–73.
15. Petros P. Stress urinary incontinence results from muscle weakness and ligamentous laxity in the pelvic floor. *J Pelviperineol* 2008; 27: 107-9.
16. Allen C, Keane D. Pathophysiology of urinary incontinence. *Gynaecological Practice* 2005; 5: 65–70.
17. Enhorning G. Simultaneous recording of intravesical and intra-urethral pressure. A study on urethral closure in normal and stress incontinent women. *Acta Chir Scand Suppl* 1961;Suppl 276:1–68.

18. Lin LY, Chen SY, Lee HS, Chung SL, Ying TH, Chen GD. Female bladder neck changes with position. *Int Urogynecol J Pelvic Floor Dysfunct* 1999;10(5):277–82.
19. DeLancey JO. Structural support of the urethra as it relates to stress urinary incontinence: the hammock hypothesis. *Am J Obstet Gynecol.* 1994;170(6):1713–20.
20. Ashton-Miller JA, Howard D, DeLancey JO. The functional anatomy of the female pelvic floor and stress continence control system. *Scand J Urol Nephrol Suppl* 2001;(207):1–7.
21. Chapple CR, Helm CW, Blease S, Milroy EJ, Rickards D, Osborne JL. Asymptomatic bladder neck incompetence in nulliparous females. *Br J Urol* 1989;64(4):357–9.
22. Gosling JA, Dixon JS, Critchley HO, Thompson SA. A comparative study of the human external sphincter and periurethral levator ani muscles. *Br J Urol* 1981;53(1):35–41.
23. DeLancey JO. Stress urinary incontinence: where are we now, where should we go? *Am J Obstet Gynecol* 1996;175(2):311–9.
24. Horbach NS, Ostergard DR. Predicting intrinsic urethral sphincter dysfunction in women with stress urinary incontinence. *Obstet Gynecol* 1994;84(2):188–92.
25. Koelbl H, Nitti V, Baessler K, Salvatore S, Sultan A YO. Pathophysiology of Urinary Incontinence, Faecal Incontinence and Pelvic Organ Prolapse. In: Abrams P, Cardozo L, Khoury S, et al. *Incontinence. 4th International Consultation on Incontinence. Committee 4.* Paris. 2009.
26. Wein A, Kavoussi L, Novick A, Partin A PC. Vaginal reconstructive surgery for sphincteric incontinence and prolapse. In: *Campbell-Walsh Textbook, Wein A (ed). 10th ed. vol 5.* Philadelphia: Saunders, 2012. 66: 2188-233.
27. Ortiz OC. Stress urinary incontinence in the gynecological practice. *Int J Gynecol Obstet* 2004; 86: 6-16.
28. Haab F, Zimmernt PE, Leach GE. FEMALE STRESS URINARY INCONTINENCE DUE TO INTRINSIC SPHINCTERIC DEFICIENCY: RECOGNITION AND MANAGEMENT. *J Urol* 1996; 156: 3-17.
29. Staskin D, Kelleher C, Avery K, Bosch R, Cotterill N, Coyne K et al. Initial Assessment of Urinary and Faecal Incontinence in Adult Male and Female Patients. In: Abrams P, Cardozo L, Khoury S, et al. *Incontinence. 4th International Consultation on Incontinence. Committee 5.* Paris. 2009.
30. Hannestad YS, Rortveit G, Daltveit AK, Hunskaar S. Are smoking and other lifestyle factors associated with female urinary incontinence? The Norwegian EPINCONT Study. *BJOG* 2003;110(3):247–54.
31. Herbruck LF. Stress urinary incontinence: an overview of diagnosis and treatment options. *Urol Nurs* 2008;28(3):186–98.
32. Richter HE, Burgio KL, Brubaker L, Moalli PA, Markland AD, Mallet V, et al. Factors associated with incontinence frequency in a surgical cohort of stress incontinent women. *Am J Obstet Gynecol* 2005;193(6):2088–93.

33. Albo ME, Richter HE, Brubaker L, Norton P, Kraus SR, Zimmern PE, Tennstedt S, Ph D, Nager C, et al. Burch Colposuspension versus Fascial Sling to Reduce Urinary Stress Incontinence. *N Engl J Med* 2007; 356: 2143-55.
34. Athanasopoulos A, Gyftopoulos K, McGuire EJ. Efficacy and preoperative prognostic factors of autologous fascia rectus sling for treatment of female stress urinary incontinence. *Urology* 2011;78(5):1034–8.
35. Latthe PM, Singh P, Foon R, Tooze-Hobson P. Two routes of transobturator tape procedures in stress urinary incontinence: a meta-analysis with direct and indirect comparison of randomized trials. *BJU Int* 2010;106(1):68–76.
36. Martan A, Mašata J, Svabík K. The vaginal tension-free tape procedure solving stress urinary incontinence in woman]. *Ceska Gynekol* 2012;77(4):299–304.
37. O'Connor RC, Nanigian DK, Lyon MB, Ellison LM, Bales GT, Stone AR. Early outcomes of mid-urethral slings for female stress urinary incontinence stratified by valsalva leak point pressure. *Neurourol Urodyn* 2006;25(7):685–8.
38. Raz S, Siegel AL, Short JL, Snyder JA, Snyder JA. Vaginal wall sling. *J Urol* 1989;141(1):43–6.
39. Appell R. Percutaneous Bladder Neck Stabilization for Stress Urinary Incontinence in Women: The Technique, Risks, Benefits. *Medscape Womens Health* 1997;2(8):3.
40. Fayed AS, El-Salmy S SM. Tension-Free Vaginal Flap ( TVF ) for the treatment of stress urinary incontinence in females . *International Continence Society, 32nd ed. Heidelberg: Annual meeting, 2002. 302. :302.*
41. Shoukry M, Hassouna M, AbdEl-Kerim A, **El-Salmy S**. Rolled Vaginal Wall Flap for The Treatment of Stress Urinary Incontinence. *African J Urol* 2011; 17: 1-5.
42. Hashim H, Avery K, Mourad MS, Chamssuddin A, Ghoniem G, Abrams P. The Arabic ICIQ-UI SF: an alternative language version of the English ICIQ-UI SF. *Neurourol Urodyn* 2006;25(3):277–82.
43. Abrams P, Avery K, Gardener N, Donovan J. The International Consultation on Incontinence Modular Questionnaire: [www.iciq.net](http://www.iciq.net). *J Urol* 2006;175:1063–6.
44. Blaivas JG, Groutz A. Bladder outlet obstruction nomogram for women with lower urinary tract symptomatology. *Neurourol Urodyn* 2000;19(5):553–64.
45. Massolt ET, Groen J, Vierhout ME. Application of the Blaivas-Groutz bladder outlet obstruction nomogram in women with urinary incontinence. *Neurourol Urodyn* 2005;24(3):237–42.
46. Thom D. Variation in estimates of urinary incontinence prevalence in the community: effects of differences in definition, population characteristics, and study type. *J Am Geriatr Soc* 1998;46(4):473–80.
47. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. *Urol* 2003;61(1):37–49.

48. Hunskaar S, Burgio K, Diokno A, Herzog AR, Hjälmås K, Lapitan MC. Epidemiology and natural history of urinary incontinence in women. *Urol* 2003;62(4 Suppl 1):16–23.
49. Chiarelli P, Brown W, McElduff P. Leaking urine: prevalence and associated factors in Australian women. *Neurourol Urodyn* 1999;18(6):567–77.
50. Cardozo L. Duloxetine in the context of current needs and issues in treatment of women with stress urinary incontinence. *BJOG* 2006;113 Suppl :1–4.
51. Subak LL, Brown JS, Kraus SR, Brubaker L, Lin F, Richter HE, et al. The “costs” of urinary incontinence for women. *Obstet Gynecol* 2006;107(4):908–16.
52. Lapitan MCM, Cody JD, Grant A. Open retropubic colposuspension for urinary incontinence in women. *Cochrane database Syst Rev* 2009;(2):CD002912.
53. Doran CM, Chiarelli P, Cockburn J. Economic costs of urinary incontinence in community-dwelling Australian women. *Med J Aust* 2001;174(9):456–8.
54. Kim S, Kim YJ, Yoo DH, Hwang IS, Hwang EC, Jung S Il, et al. Clinical Factors Associated with Low Valsalva Leak Point Pressure Among Women with Stress Urinary Incontinence. *Int Neurol J* 2011; 15: 211-5.
55. Betson LH, Siddiqui G, Bhatia NN. Intrinsic urethral sphincteric deficiency: critical analysis of various diagnostic modalities. *Curr Opin Obstet Gynecol* 2003;15(5):411–7.
56. Richter HE, Litman HJ, Lukacz ES, Sirls LT, Rickey L, Norton P, et al. Demographic and clinical predictors of treatment failure one year after midurethral sling surgery. *Obstet Gynecol* 2011;117(4):913–21.
57. Cammu H, Van Den Abbeele E, Nagel H, Haentjens P. Factors predictive of outcome in tension-free vaginal tape procedure for urinary stress incontinence in a teaching hospital. *Int Urogynecol J Pelvic Floor Dysfunct* 2009;20(7):775–80.
58. Stav K, Dwyer PL, Rosamilia A, Schierlitz L, Lim YN, Lee J. Risk factors of treatment failure of midurethral sling procedures for women with urinary stress incontinence. *Int Urogynecol J* 2010;21(2):149–55.
59. Houwert RM, Venema PL, Aquarius AE, Bruinse HW, Roovers JPWR, Vervest HAM. Risk factors for failure of retropubic and transobturator midurethral slings. *Am J Obstet Gynecol* 2009;201(2):202.e1–8.
60. Nitti VW. Pressure flow urodynamic studies: the gold standard for diagnosing bladder outlet obstruction. *Rev Urol* 2005;7 Suppl 6:S14–21.
61. Defreitas GA, Zimmern PE, Lemack GE, Shariat SF. Refining diagnosis of anatomic female bladder outlet obstruction: comparison of pressure-flow study parameters in clinically obstructed women with those of normal controls. *Urol* 2004;64(4):675–9.
62. Richter HE, Norman AM, Burgio KL, Goode PS, Wright KC, Benton J, et al. Tension-free vaginal tape: a prospective subjective and objective outcome analysis. *Int Urogynecol J Pelvic Floor Dysfunct* 2005;16(2):109–13.
63. Sirls LT, Tennstedt S, Lukacz E, Rickey L, Kraus SR, Markland AD, et al. Condition-specific quality of life 24 months after retropubic and transobturator sling

- surgery for stress urinary incontinence. *Female Pelvic Med Reconstr Surg* 2012;18(5):291–5.
64. Tennstedt SL, Litman HJ, Zimmern P, Ghetti C, Kusek JW, Nager CW, et al. Quality of life after surgery for stress incontinence. *Int Urogynecol J Pelvic Floor Dysfunct* 2008;19(12):1631–8.
  65. Mitsui T, Tanaka H, Moriya K, Kakizaki H, Nonomura K. Clinical and urodynamic outcomes of pubovaginal sling procedure with autologous rectus fascia for stress urinary incontinence. *Int J Urol* 2007;14(12):1076–9.
  66. Palma PCR, Dambros M, Riccetto CLZ, Thiel M, Netto Júnior NR. [Transvaginal urethrolisis for urethral obstruction after anti-incontinence surgery]. *Actas Urol españolas* 2005;29(2):207–11.
  67. Natale F, La Penna C, Saltari M, Piccione E, Cervigni M. Voiding dysfunction after anti-incontinence surgery. *Minerva Ginecol* 2009;61(2):167–72.
  68. Romero Maroto J, Prieto Chaparro L, López López C, Quilez Fenoll JM, Rodríguez Fernández E. [Obstruction following surgical repair of female stress urinary incontinence. Diagnosis and treatment]. *Arch españoles Urol* 2002;55(9):1107–14.
  69. Holmgren C, Hellberg D, Lanner L, Nilsson S. Quality of life after tension-free vaginal tape surgery for female stress incontinence. *Scand J Urol Nephrol* 2006;40(2):131–7.
  70. Avery K, Donovan J, Peters TJ, Shaw C, Gotoh M, Abrams P. ICIQ: a brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourol Urodyn* 2004;23(4):322–30.
  71. Klovning A, Avery K, Sandvik H, Hunnskaar S. Comparison of two questionnaires for assessing the severity of urinary incontinence: The ICIQ-UI SF versus the incontinence severity index. *Neurourol Urodyn* 2009;28(5):411–5.
  72. Tennstedt S. Design of the Stress Incontinence Surgical Treatment Efficacy Trial (SISTEr). *Urol* 2005;66(6):1213–7.
  73. Sandvik H, Seim A, Vanvik A, Hunnskaar S. A severity index for epidemiological surveys of female urinary incontinence: comparison with 48-hour pad-weighing tests. *Neurourol Urodyn* 2000;19(2):137–45.
  74. Morgan TO, Westney OL, McGuire EJ. Pubovaginal sling: 4-YEAR outcome analysis and quality of life assessment. *J Urol* 2000;163(6):1845–8.
  75. Ghoniem GM. Surgical management of intrinsic sphincter deficiency in women. *Curr Opin Urol* 2000;10(3):245–50.
  76. Toh K, Diokno AC. Management of intrinsic sphincter deficiency in adolescent females with normal bladder emptying function. *J Urol* 2002;168(3):1150–3.
  77. Wilson TS, Lemack GE, Zimmern PE. Management of intrinsic sphincteric deficiency in women. *J Urol* 2003;169(5):1662–9.
  78. Leach GE, Dmochowski RR, Appell RA, Blaiwas JG, Hadley HR, Luber KM, et al. Female Stress Urinary Incontinence Clinical Guidelines Panel summary report on surgical management of female stress urinary incontinence. The American Urological Association. *J Urol* 1997;158(3 Pt 1):875–80.

79. Silva-filho A, Triginelli S, Noviello M, Santos-filho A, Pires C CJ. Pubovaginal sling in the treatment of stress urinary incontinence for urethral hypermobility and intrinsic sphincter deficiency. *Int Brazilian J Urol* 2003;29:540–4.
80. GJ J. Stress Incontinence. In: Mundy AR, Stephenson TP, Wein AJ (eds). *Urodynamics: Principles, Practice and Application*. 2nd ed. New York: Churchill Livingstone. 1994.
81. Bidmead J, Cardozo L. Sling techniques in the treatment of genuine stress incontinence. *BJOG* 2000;107(2):147–56.
82. Dmochowski RR, Appell RA. Injectable agents in the treatment of stress urinary incontinence in women: where are we now? *Urol* 2000;56(6 Suppl 1):32–40.
83. Cross CA, English SF, Cespedes RD, McGuire EJ. A followup on transurethral collagen injection therapy for urinary incontinence. *J Urol* 1998;159(1):106–8.
84. Corcos J, Fournier C. Periurethral collagen injection for the treatment of female stress urinary incontinence: 4-year follow-up results. *Urol* 1999;54(5):815–8.
85. Petrou SP, Elliott DS, Barrett DM. Artificial urethral sphincter for incontinence. *Urol* 2000;56(3):353–9.
86. Appell RA. Techniques and results in the implantation of the artificial urinary sphincter in women with type III stress urinary incontinence by a vaginal approach. *Neurourol Urodyn* 1988;7(6):613–9.
87. Chartier-Kastler E, Van Kerrebroeck P, Ollanas R, Cosson M, Mandron E, Delorme E, et al. Artificial urinary sphincter (AMS 800) implantation for women with intrinsic sphincter deficiency: a technique for insiders? *BJU Int* 2011;107(10):1618–26.
88. Costa P, Mottet N, Rabut B, Thuret R, Ben Naoum K, Wagner L. The use of an artificial urinary sphincter in women with type III incontinence and a negative Marshall test. *J Urol* 2001;165(4):1172–6.
89. Mark S WG. Stress urinary incontinence due primarily to intrinsic sphincteric deficiency: Experience with artificial urinary sphincter and sling cystourethropexy. *J Urol* 1994;151:769.
90. Kuuva N, Nilsson CG. Long-term results of the tension-free vaginal tape operation in an unselected group of 129 stress incontinent women. *Acta Obstet Gynecol Scand* 2006;85(4):482–7.
91. Doo CK, Hong B, Chung BJ, Kim JY, Jung HC, Lee K-S, et al. Five-year outcomes of the tension-free vaginal tape procedure for treatment of female stress urinary incontinence. *Eur Urol* 2006;50(2):333–8.
92. Paick J-S, Ku JH, Shin JW, Son H, Oh S-J, Kim SW. Tension-free vaginal tape procedure for urinary incontinence with low Valsalva leak point pressure. *J Urol* 2004;172(4 Pt 1):1370–3.
93. Sergent F, Popovic I, Grise P, Leroi A-M, Marpeau L. Three-year outcomes of the tension-free vaginal tape procedure for treatment of female stress urinary incontinence with low urethral closure pressure. *Gynécologie, Obs Fertil* 2006;34(9):692–700.

94. Choo G-Y, Kim DH, Park HK, Paick S-H, Lho Y-S, Kim H-G. Long-term Outcomes of Tension-free Vaginal Tape Procedure for Treatment of Female Stress Urinary Incontinence with Intrinsic Sphincter Deficiency. *Int Neurourol J* 2012;16(1):47–50.
95. Meschia M, Pifarotti P, Buonaguidi A, Gattei U, Spennacchio M. Tension-free vaginal tape (TVT) for treatment of stress urinary incontinence in women with low-pressure urethra. *Eur J Obstet Gynecol Reprod Biol* 2005;122(1):118–21.
96. Liapis A, Bakas P, Salamalekis E, Botsis D, Creatsas G. Tension-free vaginal tape (TVT) in women with low urethral closure pressure. *Eur J Obstet Gynecol Reprod Biol* 2004;116(1):67–70.
97. Ogah J, Cody JD, Rogerson L. Minimally invasive synthetic suburethral sling operations for stress urinary incontinence in women. *Cochrane database Syst Rev*. 2009;(4):CD006375.
98. FDA Safety communication: Urogynecologic Surgical Mesh: Update on the Safety and Effectiveness of Trans-vaginal Placement for Pelvic Organ Prolapse. July 2011.
99. Raz S, Stothers L, Young GP, Short J, Marks B, Chopra A, et al. Vaginal wall sling for anatomical incontinence and intrinsic sphincter dysfunction: efficacy and outcome analysis. *J Urol* 1996;156(1):166–70.
100. Vasavada SP, Rackley RR, Appell RA. In situ anterior vaginal wall sling formation with preservation of the endopelvic fascia for treatment of stress urinary incontinence. *Int Urogynecol J Pelvic Floor Dysfunct* 1998;9(6):379–84.
101. Costantini E, Mearini L, Mearini E, Pajoncini C, Guercini F, Bini V, et al. Assessing outcome after a modified vaginal wall sling for stress incontinence with intrinsic sphincter deficiency. *Int Urogynecol J Pelvic Floor Dysfunct* 2005;16(2):138–46.
102. Kaplan SA, Santarosa RP, Te AE. Comparison of fascial and vaginal wall slings in the management of intrinsic sphincter deficiency. *Urol* 1996;47(6):885–9.
103. Choe JM, Kothandapani R, James L, Bowling D. Autologous, cadaveric, and synthetic materials used in sling surgery: comparative biomechanical analysis. *Urol* 2001;58(3):482–6.
104. Haab F, Trockman BA, Zimmern PE, Leach GE. Results of pubovaginal sling for the treatment of intrinsic sphincteric deficiency determined by questionnaire analysis. *J Urol* 1997;158(5):1738–41.
105. Hassouna ME, Ghoniem GM. Long-term outcome and quality of life after modified pubovaginal sling for intrinsic sphincteric deficiency. *Urol* 1999;53(2):287–91.

# PROTOCOL

ASSESSMENT O ROLLED FORTIFIED VAGINAL FLAP FOR  
STRESS URINARY INCONTINENCE IN FEMALES WITH  
INTRINSIC SPHINCTERIC DEFICENCY

تقييم السدلة المهبلية المقواه لاصلاح السلس البولى الاجهادى عند النساء الذين يعانون من  
خلل الصمام الداخلى

Protocol of a thesis submitted  
to the Faculty of Medicine  
University of Alexandria  
In partial fulfillment of the  
requirements of the degree of  
Master of Genitourinary Surgery

by

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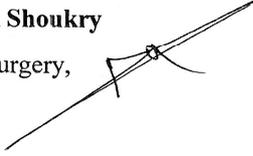
خطة بحث مقدمة  
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الماجستير فى جراحة المسالك البولية و  
التناسلية

من

هيثم محمد ابراهيم كامل  
بكالوريوس الطب والجراحة ؛ الاسكندرية  
طبيب مقيم  
مستشفيات جامعة الاسكندرية  
قسم جراحة المسالك البولية و التناسلية  
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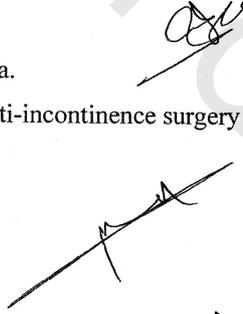


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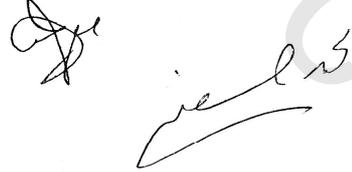
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3

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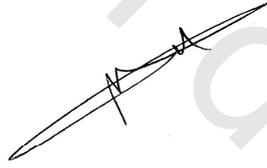
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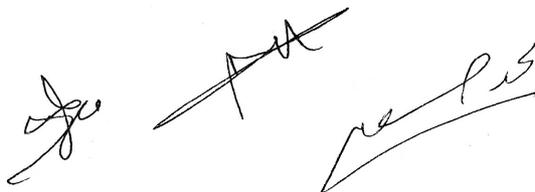
## INTRODUCTION

Stress Urinary Incontinence (SUI) is defined as the symptomatic complaint of involuntary leakage of urine on effort, exertion, sneezing or coughing and the sign of involuntary urinary loss from the urethra synchronous with exertion, sneezing, or coughing.<sup>(1)</sup>

Intrinsic Sphincter Deficiency (ISD) is defined as the disorder of the urethra due to intrinsic sphincter damage in which the urethra is usually well supported but there is opening of the bladder neck and posterior urethra during straining, which has been classified as type III incontinence. On urodynamics, ISD is defined as Abdominal Leak Point Pressure (ALPP) less than or equal to 60 cm H<sub>2</sub>O and a Maximal Urethral Closure Pressure (MUCP) of less than 20 cm H<sub>2</sub>O.<sup>(2-4)</sup>

The risk factors to develop SUI are age, Caucasian or Hispanic races, obesity, smoking, chronic cough, pregnancy and childbirth, nerve injuries to the lower back and pelvic surgeries.<sup>(5,6)</sup>

Stress Urinary Incontinence (SUI) due to intrinsic sphincter deficiency (ISD) is the most challenging in anti-incontinence repair. ISD women can have successful long-term surgical outcomes after Tension free Vaginal Tape (TVT) procedures. However, clinicians should consider the possibility of TVT procedure failure in ISD women who have extremely low Valsalva Leak Point Pressure (VLPP).<sup>(7)</sup> Rezapour et al determined the following cases as high-risk factors of failure: when patients are older than 70 years, when MUCP is below 10, and when the patients have an immotile urethra.<sup>(8)</sup>



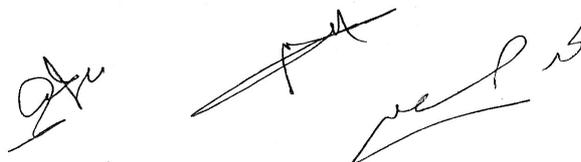
Anterior vaginal wall slings (AVWS) have been used for decades in the treatment of SUI. Initially pubovaginal slings using autologous fascia, either rectus fascia or fascia lata, were the gold standards for treatment of SUI till the nineties.<sup>(9)</sup>

In an effort to reduce the morbidity and discomfort associated with fascial harvesting, synthetic tapes placed by a retropubic or transobturator route were developed and have been applied successfully for over a decade. Tension free vaginal tape procedure may have an acceptable rate of complications such as infection, organ injuries and erosions, but they are costly.<sup>(10,11)</sup>

Recently, Trans Obturator Tape (TOT) has been used for the treatment of SUI patients along with Tension-Free Vaginal Tape (TVT), but there have been only a few reports on its outcomes for SUI with ISD. O'Connor et al categorizes a group of patients with VLPP of less than 60 cm H<sub>2</sub>O who had TOT. They reported that the success rate of the group was only 25%, because the mesh tape of TOT, which was more horizontally placed, lacked support because it wrapped a smaller part of the urethra in comparison with that by TVT.<sup>(12)</sup>

The AVWS was originally described by Raz et al in 1989. This technique uses in situ vaginal wall over the bladder neck and proximal urethra as the sling material. It avoids morbidity of autologous fascial harvesting, does not have an increased rate of infection or erosion and is available at no cost. The advantages are its simplicity, need for only a small incision, short operative time and hospital stay and reliance on healthy well vascularized in situ tissue.<sup>(13)</sup>

A modified technique for the treatment of Stress Urinary Incontinence (SUI) in females is the Tension-Free Vaginal Flap (TVF) technique was described by



Fayed et al.<sup>(14)</sup> It is based on both concepts of TVT and vaginal wall sling procedures, in order to achieve similar success rate with low costs. A vaginal wall flap based on the mid urethra was created. The flap is 4 cm wide and 2 cm long, with the distal incision slightly longer than the proximal one. Minimal dissection of the flap maintains its adequate blood supply. Four corners sutures 1/0 were taken into the flap and passed into the anterior abdominal wall using Stamey needle. Sutures of each side were tied to each other with undue tension, the knots were away from the rectus sheath by 1 cm.<sup>(14)</sup>

The main drawback of using the vaginal wall as a sling is its tendency to stretch and weaken overtime. A modification of the TVF is the Rolled Fortified Vaginal Flap (RFVF).<sup>(13)</sup> The aim of this modification is to reinforce the vaginal wall flap and prevent its laxity over time especially for ISD patients to offer them an effective and durable alternative to the successful modern tapes.<sup>(13)</sup>

### AIM OF THE WORK

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.

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## METHODS

Twenty female patients with Stress Urinary Incontinence (SUI) due to Intrinsic Sphincter Deficiency (ISD) will undergo rolled fortified vaginal flap (RFVF) procedure. Patients will be recruited from the Genitourinary Surgery Department at Alexandria Main University Hospital.

Technique of Rolled Fortified Vaginal Flap (RFVF) procedure includes fashioning a rectangular anterior vaginal wall flap then cauterization of its surface. Two diagonal rows of zero prolene sutures are taken through the flap to further fortify the vaginal flap. The two threads are passed to the suprapubic area and tied over the rectus sheath loosely. In this way no tension is applied on the flap<sup>(13)</sup>

Data will be collected through direct interviewing with the patients, clinical examination, urodynamic testing and operative findings. A specially designed questionnaire will be utilized to collect the required information.

The patients will be evaluated pre-operatively, 1 month and 6 months postoperatively. Patient evaluation will be done as follows:

- Assessment of primary outcome both subjectively and objectively:
  - Subjective evaluation by interviewing the patients and filling of The
  - International Consultation on Incontinence Modular Questionnaire (ICIQ).<sup>(15,16)</sup>
  - Objective evaluation by using cough stress test in the sitting and standing positions with half full and full bladder. Also urodynamic filling cystometry will be done to assess VLPP.
- Assessment of secondary outcome as regards:



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- Operative data time and complications. Postoperative hospital stay, pain, analgesic requirement and complications. Effect on sexual life of the patient.

An informed consent will be obtained from all cases after explaining the objectives of the study to them. They will be notified that whether they accepted or not to share in the study; nothing will be taken against them and they will have the same quality of medical care.

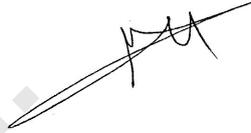
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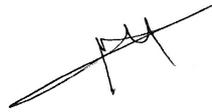
## RESULTS

The results obtained will be tabulated and analyzed with the use of appropriate statistical methods.

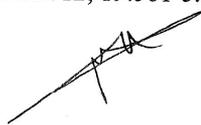

## DISCUSSION

The reported data will be discussed in view of achievement of the aim and will be compared to available works in the literature.

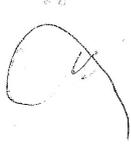


## REFERENCES

1. Wein, Kavoussi, Novick, Partin, Peters. Vaginal reconstructive surgery for sphincteric incontinence and prolapse. Campbell-Walsh Textbook (10<sup>th</sup> edition) 2012 volume 5; 66:2188-233.
2. Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, et al. An International Urogynecologic Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Int Urogynecol J 2010; 21:5.
3. Neves T, Gontard A, Hoebeke P, Hjalmas K, Bauer S, Bower W. The standardization of terminology of lower urinary tract function in children and adolescents: report from the standardization committee of the International Children's Continence Society (ICCS). Neurourol Urodyn 2007; 26:90-102.
4. Hampel C, Weinhold D, Benken N, Eggersmann C, Thuroff JW. Definition of overactive bladder and epidemiology of urinary incontinence. Urology 1997; 50:4-14.
5. Dmochowski RR, Blaivs JM, Gormley EA, Juma S, Karram MM, Lightner DJ, et al. Update of AUA guideline on the surgical management of female stress urinary incontinence. J Urol 2010; 183:1906-14.
6. Chmaj-Wierzchowska K, Pięta B, Kotecka M, Michalak M, Sajdak S, Opala T. Three most important etiological factors of occurrence of stress urinary incontinence in nulliparous pre-and postmenopausal Polish women. Ann Agric Environ Med 2012; 19:581-5.



7. Choo G, Kim D, Park H, Paick S, Lho Y, Kim H. Long term outcomes of tension free vaginal tape procedure for treatment of female urinary stress incontinence with intrinsic sphincter deficiency. *Int Neurourol J* 2012; 16:47-50.
8. Rezapour M, Falconer C, Ulmsten U. Tension-free vaginal tape (TVT) in stress incontinent women with intrinsic sphincter deficiency (ISD)--a long-term follow-up. *Int Urogynecol J Pelvic Floor Dysfunct* 2001; 12(Suppl 2):S12-4.
9. Athanasopoulos A, Gyftopoulos K, McGuire EJ. Efficacy and preoperative prognostic factors of autologous fascia rectus sling for treatment of female stress urinary incontinence. *Urology* 2011; 78:1034-8.
10. Latthe PM, Singh P, Foon R, Toozs-Hobson P. Two routes of transobturator tape procedures in stress urinary incontinence: a meta-analysis with direct and indirect comparison of randomized trials. *BJU Int* 2010; 106:68-76.
11. Martan A, Mašata J, Svabík K. The vaginal tension free tape procedure solving stress urinary incontinence in woman. *Ceska Gynekol* 2012; 77:299-304.
12. O'Connor RC, Nanigian DK, Lyon MB, Ellison LM, Bales GT, Stone AR. Early outcomes of mid-urethral slings for female stress urinary incontinence stratified by valsalva leak point pressure. *Neurourol Urodyn* 2006; 25:685-8.
13. Shoukry M, Hassouna M, AbdEl-Kerim A, El-Salmy S. Rolled vaginal wall flap for the treatment of stress urinary incontinence. *African J of Urol* 2011; 17:1-5.

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14. Fayed AS, El-Salmy S, Shoukry M, Koraitam A, Hassouna M. Tension-free vaginal flap (TVF) for the treatment of stress urinary incontinence in females. International Continence Society, 32nd Annual meeting, August 2002; Heidelberg, Abstract no. 302
  15. Hashim H, Avery K, Mourad M S, Chamssuddin A, Ghoniem G, Abrams P. The Arabic ICIQ-UI SF: an alternative language version of the English ICIQ-UI SF. NeuroUrol Urodyn 2006; 25: 277-82.
  16. Abrams P, Avery K, Gardener N, Donovan J. The International Consultation on Incontinence Modular Questionnaire. J Urol 2006; 175:1063-6.
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# **ARABIC SUMMARY**

## الملخص العربي

خلل الصمام الداخلي من العوامل المهمة المسببة للسلس البولي الإجهادي. وقد أبرزت التطورات الحديثة في الدراسات الديناميكية للتبول إمكانية التشخيص الدقيق لخلل الصمام الداخلي. وقد تم التأكيد على أهميه هذا الموضوع بعد نسبة الفشل العالية من العمليات الجراحية لتصحيح السلس البولي نتيجة خلل الصمام الداخلي ونظرا لارتفاع معدل انتشار السلس البولي خاصة عند النساء، فإنه يعتبر مشكلة صحية اجتماعية هامة تؤثر على الأنشطة اليومية ونوعية الحياة، وتؤثر هذه المشكلة على الجوانب المادية والفكرية والجنسية للشخص كما يؤثر على وضعه الاجتماعي ويقلل من جودة الحياة والثقة بالنفس.

ولهذا تم إجراء الدراسة الحالية للكشف عن أثر عملية السدلة المهبلية المقواة في علاج السلس البولي الإجهادي بسبب خلل الصمام الداخلي لتقييم الجدوى الفنية للعملية، والتعرف على المضاعفات التي قد تنتج جراء العملية، وتكشف عن أثر العملية على جودة حياة النساء اللاتي يعانين من السلس البولي الإجهادي، ولتحقيق هذه الأهداف أدرجت عشرين امرأة تعاني من السلس البولي الإجهادي بسبب خلل الصمام الداخلي في دراسة مستقبلية، ولقد خضع جميع المرضى إلى أخذ التاريخ الطبي، والفحص السريري، بالإضافة إلى اختبارات بعينها مثل اختبار السعال، واختبار تلميح، والدراسات الديناميكية للجهاز البولي، تم تقييم جودة الحياة باستخدام النسخة العربية من المشاورة الدولية على سلس البول وحدات استبيان - سلس البول - النموذج القصير، ولقد تم تتبع جميع النساء لمدة ٦ أشهر للكشف عن مضاعفات ما بعد الجراحة وتحديد التغيرات في جودة الحياة.

تم إجراء عملية السدلة المهبلية المقواة لجميع المرضى، وأجريت العملية تحت التخدير الشوكي في موقف استخراج الحصة الظهريّة، مع تركيب قسطرة البول حتى تبقى المثانة فارغة في جميع الأوقات، وبعد ذلك تم استخدام مبادئ المرجح لظهور الأنسجة المهبلية. وتم عمل سدلة مستطيلة من جدار المهبل الأمامي، ثم تم كي سطح السدلة المهبلية؛ وتبع ذلك وضع صفيين قطر من خيوط البرولين مقاس الصفر، ثم تم خياطه السدلة على نفسها، ثم علقت السدلة المهبلية من الجانبين التي يتم تمريرها في المنطقة فوق العانة عن طريق مرور إبرة ستامى من خلال شقين في البطن، وارتبطت الغرز مع بعضها البعض.

شملت هذه الدراسة ٢٠ مريضة يشكين من السلس البولي الإجهادي بسبب خلل الصمام الداخلي. متوسط أعمارهن  $43.0 \pm 8.7$  عاما. أظهرت نتائج دراسة ديناميكية التبول قبل الجراحة أن أقصى ضغط لاختبار "فالسفا" تراوحت من ٢٠-٦٠ سم مياه بمتوسط قدره  $50.05 \pm 11.2$  سم مياه ووسيط قدره  $53.50$  سم مياه. وكان اختبار السعال إيجابيا لجميع نساء الدراسة، ولقد شكلت النساء اللاتي يعانين من فرط حركة مجري البول  $45\%$  (٩ نساء) بينما لم يعانين باقي النساء  $55\%$  من ذلك الداء.

انخفض الحد الأقصى لمعدل التدفق البولي انخفاضا طفيفا من  $22.2 \pm 3.5$  إلى  $21.4 \pm 3.5$  بعد شهر واحد ولكن هذا الانخفاض لم يكن ذو دلالة إحصائية جوهرية ( $P = 0.001$ )، حدث تسرب بولي لثلاث مرضى خاضعين للدراسة كما أوضحت الدراسة الديناميكية للتبول خلال فترة المتابعة بعد شهر و ٦ أشهر و تم اجراء تعديل للغرز الجراحية لمريضة واحدة.

لم يلاحظ أي تغيير ملموس للحد الأقصى لمعدل التدفق بدون قسطرة خلال فترة المتابعة. وأظهر الضغط الأقصى للنفاضة عن انخفاض طفيف لكن لم يكن ذو دلالة إحصائية جوهرية. واستخدم هذين المؤشرين للكشف عن انسداد المسالك البولية باستخدام الرسم التخطيطي لانسداد مخرج المثانة البولية، حيث عانت أربع نساء  $20\%$  من إعاقة بولية خفيفة عند الشهر الأول من المتابعة، وانخفض هذا العدد إلى اثنين فقط  $10\%$  بعد ٦ أشهر من المتابعة.

لوحظ احتباس البول العابر لدى  $25\%$  من النساء بعد العملية مباشرة (خلال الأسبوع الأول)، في حين لم تعاني أي امرأة من مثل تلك الأعراض بعد شهر أو ٦ أشهر من المتابعة، كما ظهر التهاب المثانة في ثلاث حالات فقط  $15\%$ . ولوحظ سلس البول بين ثلاث حالات  $15\%$  على الفور بعد العمل الجراحي وحالتين  $10\%$  بعد شهر واحد من المتابعة، ولقد أجرى تعديل الغرز الجراحية لحالة واحدة فقط لتصحيح سلس البول.

وقد استخدمت المشاورة الدولية لاستبيان سلس البول النموذج القصير (ICIQ-UI) لقياس جودة الحياة قبل الجراحة ثم أعيدت بعد شهر و ٦ أشهر بعد التدخل الجراحي، ولقد انخفض متوسط نقاط المقياس من  $73.57 \pm 12.01\%$  (قبل الجراحة) إلى  $2.62 \pm 8.09\%$  بعد ٦ أشهر من المتابعة، بما يفيد تحسن جودة حياة النساء اللاتي أجرين العملية، كما لوحظ تسريب بولي لمرة واحدة أسبوعيا أثناء ممارسة النشاط البدني أو الرياضي لدى  $10\%$  فقط بعد شهر من المتابعة بينما استمر نفس معدل التسرب بعد ستة أشهر من المتابعة.

في نهاية هذه الدراسة فإننا استنتجنا أن عملية السدلة المهبلية المقواة هي تقنية آمنة وفعالة في علاج الإناث الذين يشكون من السلس البولي الاجهادى بسبب خلل الصمام الداخلي مع إيواء مضاعفات قليلة خلال فترة متابعة قصيرة مكونه من ٦ أشهر.

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تقييم السدلة المهبلية المقواه لاصلاح السلس البولي الاجهادى عند النساء الذين يعانون من  
خلل الصمام الداخلى

مقدمة من

هيثم محمد إبراهيم كامل

بكالوريوس الطب والجراحة - جامعة الإسكندرية، ٢٠٠٨

للحصول على درجة

الماجستير

فى

جراحة المسالك البولية والتناسلية

موافقون

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خلل الصمام الداخلى

رسالة

مقدمة لكلية الطب - جامعة الإسكندرية  
إستيفاء للدراسات المقررة للحصول على درجة

الماجستير

فى

جراحة المسالك البولية والتناسلية

مقدمة من

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