TRANSOBTURATOR TENSION-FREE MID-URETHRAL SLING USING TYPE-I MACROPOROUS POLYPROPYLENE MESH VERSUS BURCH RETROPUBIC COLPOSUSPENSIONIN MANAGEMENT OF PRIMARY URODYNAMIC (TYPE-I) STRESS URINARY INCONTINENCE

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بسم الله الرحمن الرحيم

"وَ مَا أُوْتِيتُمْ مِنَ العِلْمِ إِلَّا قَلِيلًا"

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Mohammed Ahmed Adel Faris
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To Omar, Laila, Yasmine and my ever-beloved Khadija

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List of Abbreviations

95% CI	95% confidence interval
AFL	Autologous fascia lata
AHCPR	Agency for Health Care Policy and Research
ALPP	Abdominal leak point pressure
ARF	Autologous rectus fascia
AUA	American Urology Association
BMI	Body mass index
CFL	Cadaveric fascia lata
CIC	Clean intermittent catheterization
DA	Dermal allograft
DI	Detrusor instability
DO	Detrusor overactivity
EBL	Estimated blood loss
EMG	Electromyography
FD-CFL	Freeze-dried cadaveric fascia lata
FVC	Frequency volume chart
ICIQ	International Consultation on Incontinence Questionnaire
ICIQ-UI-SF	International Consultation on Incontinence Questionnaire – Urinary Incontinence – short form
ICS	International Continence Society
IQR	Interquartile range
ISD	Intrinsic sphincter deficiency
IUGA	International Urogynecological Association
LPP	Leak point pressure
LUT	Lower urinary tract
LUTD	Lower urinary tract disease
LUTS	Lower urinary tract symptoms
MCC	Maximum cystometric capacity
MMK	Marshall-Marchetti-Krantz Procedure
MMPs	Matrix metalloproteinases
MRI	Magnetic resonance imaging
mRNA	Messenger ribonucleic acid
MUCP	Maximum urethral closure pressure
MUI	Mixed urinary incontinence
NICE	National Institute of Health and Clinical Excellence
NIH	National Institute of Health
NPV	Negative predictive value
OAB	Overactive bladder

Pdet @ Qmax	Detrusor pressure at maximum flow rate
PGI-I	Patient Global Impression of Improvement
POP-Q	Pelvic organ prolapse quantification system
PPV	Positive predictive value
PVR	Post-void residual urine volume
Qave	Average uroflow rate
Qmax	Maximal uroflow rate
RCOG	Royal College of Obstetricians and Gynaecologists
RCT	Randomized controlled trial
RR	Relative risk
SD	Standard deviation
SIS	Small intestinal submucosa
SUI	Stress urinary incontinence
TVT	Tension-free vaginal tape
UDS	Urodynamics study
UI	Urinary incontinence
UTI	Urinary tract infection
UUI	Urge urinary incontinence
VAS	Visual analogue scale
VLPP	Valsalva leak point pressure

Introduction

Introduction

Stress urinary incontinence (SUI) is estimated to affect up to one-third of women older than the age of 18 years old, with a median age of 45 years **(Hunskaar et al., 2004)**. Surgery for stress urinary incontinence (SUI) represents one of the most common indications for surgery in women. Approximately 4% of women will undergo surgery for SUI during their lifetime **(Olsen et al., 1997)**.

Over 1,000 surgical procedures for treating SUI have been described. However, only a small number of these procedures have both withstood the test of time and held up scientific scrutiny **(Barber, 2008)**.

In 1949, Marshal, Marchetti and Krantz described a retropubic procedure (MMK), in which the rectus fascia was divided to allow access to the supportive tissue at the bladder neck, which is then fixed to the periosteum of the pubic bone. In 1961, Burch described a similar operation, in which these supporting tissues were anchored laterally to Cooper's ligament instead of the pubic bone, obviating the risk of osteitis pubis, an uncommon but debilitating complication associated with the MMK procedure. These procedures involved suspending and stabilizing the bladder neck and proximal urethra in a high retropubic position, thereby preventing their descent during times of increased intra-abdominal pressure. These techniques were effective, with mean 3-7-year continence rate of 77% **(Walters and Daneshgari, 2004)**.

More recently, suburethral pubovaginal sling operations have become popular amongst urologists and gynecologists. In 1942, Aldridge developed the first suburethral sling using rectus fascia. This avoided the need for a laparotomy, therefore decreasing morbidity, but a second incision was still required either abdominally (to harvest rectus fascia) or on the inner thigh (for fascia late) **(Aldridge, 1942)**. Published studies show long-term cure rates to be similar to Burch procedure, with sustained continence in about 85% of patients. In an attempt to obviate the need for a second incision to harvest fascia, many have evaluated the efficacy of cadaveric fascia, xenografts and synthetic materials e.g. Mersilene, Gortex, silicone and polypropylene, as the sling material **(Walter and Daneshgari, 2004; Bhargava and Chapple, 2004; Shindel and Klutke, 2005)**.

Modern surgical therapy of female SUI is no longer focused on the proximal urethra and bladder neck, but on providing additional support at the mid-urethra to restore continence. This has lead to introduction of mid-urethral sling procedures. Tension-free vaginal tape (TVT) is a standard minimally invasive procedure used to treat SUI since 1995 when it was first described by **Ulmsten et al (1995)**. The TVT procedure used a "bottom-up" retropubic route of sling passage, and was soon followed by suprapubic arch (SPARC) sling system, using similar methods via a "top-down" approach through the retropubic space toward the midurethra. TVT has shown to have similar effectiveness to colposuspension but with fewer complications **(Cody et al., 2003)**. Although success ranges from 84 to 95%, complications described include bladder, bowel, and major blood vessel injuries, as well as postoperative voiding difficulties **(de Tayrac et al., 2004)** and de novo urgency and urge incontinence **(David-Montefoire et al., 2006)**.

In 2001, Delorme described a method of inserting the tape, which passes through the obturator foramen (termed transobturator tape), thus theoretically avoiding some of the complications such as bladder perforation **(Delorme, 2001)**. In this "outside-in" technique, after the initial anterior vaginal incision and dissection, the tape is introduced from the skin of the groin into the obturator foramen and comes out in the vaginal incision. In 2003, de Leval introduced a modified technique, which is the "inside-out" approach of the transobturator sling procedure, in which the needle is passed in a reverse route, i.e. in through vaginal incision and out through the obturator foramen.

In the preliminary study, Delorme showed that there was a high success rate, no bladder perforations and few perioperative complications via the transobturator route, and this procedure was subsequently widely-adopted before proper evaluation of its effectiveness and complications. There have been several non-comparative studies that have reported good short-term and medium-term **(de Leval et al., 2005; Neuman, 2006; Latthe et al., 2008)** success rates with transobturator sling procedures with either route.

Burch retropubic colposuspension (with its modifications) remains the widely-used and gold-standard surgical procedure for urodynamic stress incontinence in Ain Shams University Maternity Hospital, however. The major obstacle of adopting the modern midurethral sling procedures (whether retropubic or transobturator) as the gold-standard procedures is the high cost