Mid urethral Tapes for Stress Urinary Incontinence





Dr David Atallah Associate Professor – Gynecologic and Breast Oncologic Surgery, Pelvic floor repair

MIPS | III Annual Meeting | Ljubljana December 10-12, 2015

Outline: Mid urethral Tapes for Stress Urinary Incontinence

- + Historical Key notes
- + Recommendations
- Types of synthetic slings and highlight on different techniques
- + In Short: Complications of MUS
- What to use, when and what are the advantages and drawbacks: Meta-analysis and RCT results

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Evolution In The Treatment Of SUI: **the milestones**



Ulmsten

 Since 1996, when Ulmsten et al published the initial paper about retropubic tension- free vaginal tape (TVT), the use of synthetic midurethral slings (MUS) has grown to become the most common surgery performed for SUI in women.

Int Urogynecol J (1996) 7:81–86 © 1996 The International Urogynecology Journal

International Urogynecology Journal

Original Article

An Ambulatory Surgical Procedure Under Local Anesthesia for Treatment of Female Urinary Incontinence

U. Ulmsten, L. Henriksson, P. Johnson and G. Varhos Department of Obstetrics and Gynecology, Akademiska Sjukhuset, Uppsala University, Uppsala, Sweden

NOTE TECHNIQUE

Un nouveau procédé de traitement de l'incontinence urinaire d'effort (IUE) : soutènement sous-urétral par une bandelette de Prolène® sous anesthésie locale

Richard VILLET (1), Caroline FITREMANN (1), Delphine SALET-LIZEE (1), Dominique COLLARD (2), Marilyne ZAFIROPULO (1)

• UROLOGIE DE LA FEMME

Progrès en Urologie (2002), 12, 70-76

Traitement de l'incontinence urinaire d'effort pure par bandelette sous-urétrale sans tension (TVT). Résultats à moyen terme d'une étude prospective sur 124 cas

Richard VILLET, David ATALLAH., Odile COTELLE-BERNEDE, Pierre GADONNEIX, Delphine SALEE-LIZEE, Michel VAN DEN AKKER

Service de Chirurgie Viscérale et Gynécologique, Hôpital des Diaconesses, Paris, France

ICS 2000, Tampere

28th - 31st August 2000

220

D ATTALAH (MD), R VILLET (MD), D SALET-LIZEE (MD), P GADONNEIX (MD), M VAN DEN AKKER (MD)

Hôpital des Diaconesses, 18 rue du Sergent Bauchat 75012 PARIS France

A THREE-YEAR POSTOPERATIVE EVALUATION OF TENSION-FREE VAGINAL TAPE (TVT) ON 138 PATIENTS

Aim of the study

This study was to evaluate and to discuss the results on TVT procedure for genuine stress incontinence (GSI) started in our department on october 1996

Patients and methods

From October 1996 to June 1999. 138 patients were operated for GSI by the TVT procedure. The mean age was 60.57

.

Year	Author	Types of Surgeries
2001	Delorme E	Trans-obturator Subfascial Hammock, MONARC (American Medical System)
2003	Deval B	Supra-pubic arc (SPARC) (American Medical System, Minnetonka, MN)
2003	Petros P	Intra-vaginal Slingplasty (IVS) Tunneller (Tyco Healthcare-United States Surgica Norwalk, CT)
2003	deLeval J	Trans-obturator vaginal tape (TVT-O) (Gynecare, Ethicon Inc)
2005	Mostow EN	Extracellular matrix graft : absorbable Sling (SIS) (Cook Biotech Inc
2006	Martan A	TVT-Secur (Gynecare, Ethicon Inc)
2007	Calvo J	MiniArc (American Medical Systems, Minnetonka, MN, USA)
2008	Palma, P	Ophira (Promedon, Cordoba, Argentina)
2009	Meschia M	Ajust (C.R. Bard, Inc., Covington, GA, USA)
2012	Dias J	Altis (Coloplast, Denmark)

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Current Guidelines

+ All recommendations are consistent with the fact that MUS are the gold standard in the treatment of uncomplicated SUI

AUA guidelines

+ STANDARD :

 The intervention choice for SUI should be based on the patient's preferences, as well as the surgeon's experience and judgment

+ RECOMMENDATION GRADE A :

+ the MUS (retropubic, transobturator, or SIS) should be offered as the preferred surgical treatment when available, due to the shorter operative time and recovery time, and the lower shortterm morbidity.

Actas Urol Esp. 2013;37(8):459-472



SPECIAL ARTICLE

EAU guidelines on surgical treatment of urinary incontinence*,**

M.G. Lucas^{a,*}, R.J.L. Bosch^b, F.C. Burkhard^c, F. Cruz^d, T.B. Madden^e, A.K. Nambiar^a, A. Neisius^f, D.J.M.K. de Ridder^g, A. Tubaro^h, W.H. Turnerⁱ, R.S. Pickard^j

Table 1 Recommendations for surgery for uncomplicated stress urinary incontinence in women.

Recommendation	GR
Offer midurethral sling to women with uncomplicated stress urinary incontinence as the initial surgical intervention whenever available.	A
Offer colposuspension (open or laparoscopic) or autologous fascial sling to women with stress urinary incontinence if midurethral sling cannot be considered.	A
Warn women who are being offered a retropubic insertion synthetic sling about the relatively higher risk of perioperative complications compared with transobturator insertion.	A
Warn women who are being offered transobturator insertion of midurethral sling about the higher risk of pain and dyspareunia in the longer term.	A
Warn women undergoing autologous fascial sling that there is a high risk of voiding difficulty and the need to perform clean intermittent self-catheterisation; ensure they are willing and able to do so.	A
Do a cystoscopy as part of retropubic insertion of a midurethral sling, or if difficulty is encountered during transobturator sling insertion, or if there is a significant cystocele.	С
Women being offered a single-incision sling device, for which an evidence base exists, should be warned that they may be less effective than standard midurethral slings and that efficacy beyond 1 yr remains uncertain.	С
Single-incision sling devices without level 1 evidence of effectiveness should only be implanted as part of a structured research programme.	A
Only offer adjustable midurethral sling as a primary surgical treatment for stress urinary incontinence within a structured research programme.	С
Do not offer periurethral bulking agents to women who are seeking a permanent cure for stress urinary incontinence.	Α

GR = grade of recommendation.



The American College of Obstetricians and Gynecologists WOMEN'S HEALTH CARE PHYSICIANS Advancing Female Pelvic Medicine and Reconstructive Surgery

PRACTICE BULLETIN

CLINICAL MANAGEMENT GUIDELINES FOR OBSTETRICIAN-GYNECOLOGISTS

NUMBER 155, NOVEMBER 2015

(Replaces Practice Bulletin Number 63, June 2005)

Urinary Incontinence in Women

+ RECOMMENDATION LEVEL A :

+ There are substantial safety and efficacy data that support the role of synthetic mesh midurethral slings as a primary surgical treatment option for stress urinary incontinence in women. Outline: Mid urethral Tapes for Stress Urinary Incontinence

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Types of synthetic slings

Types of synthetic slings

+ To date, three major slings available

- Tension-free vaginal tape (retropubic approach) TVT SPARC
- Tension-free vaginal tape (transobturator approach) TOT / TVT-O
- Minisling

+ There are different types of synthetic materials used.

- type 1 are macroporous, monofilament;
- type 2 are microporous;
- type 3 are macroporous, multifilament;
- type 4 are submicronic, coated biomaterials with pore sizes of less than 1 μ m.

Type 1 mesh has the highest biocompatibility with the least propensity for infection.

TVT/ SPARC



Two main retropubic suburethral sling

+ TVT

+ SPARC

TVT/SPARC

 Minimally invasive midurethral sling that is passed through the retropubic space and that was designed to replace functionally deficient pubourethral ligaments.

Outcomes TVT

Table 1. Long-term outcomes of the TVT procedure

Author	N	Patient group	Duration of follow-up (years)	Treatment outcomes (subjective/objective) % cured
Rezapour et al.13	34	Recurrent SUI	4	82
Rezapour et al. ¹⁴	80	Mixed UI	4	85
Rezapour et al. ¹⁵	49	Intrinsic sphincter deficiency	4	74
Deffieux et al. ¹⁶	51	SUI	6.9	80
Nilsson et al. ¹²	80	SUI	7	81.3
Moran et al. ¹⁷	40	genuine SUI	2	95

TVT v/s SPARC (outcomes)

- 2 RCTs have reported no differences in efficacy between SPARC and TVT at 2 years.
- + The success rates for SPARC and TVT were:
 - + 83 % (n=41) vs 95% (n=43), 0.05< p < 0.1 (12 months)

Eur Urol 2005; 47:537-541.

+ 80.7% (n=31) vs 87.1% (n=31), p = 0.706 (2 years)

Int Urogynecol J Pelvic Floor Dysfunct 2005; 16:230-235.

Complications TVT

Table 2. TVT co	mplica	41							
Author	N	Bladder perforations (%)	Postop voiding difficulty (%)	Postop urge (%)	Vascular injuries (%)	Urethral erosion (%)	Vaginal erosion (%)	Postop infection (%)	Nerve damage (%)
Huang et al. ²⁰	106	2	11	10	-	-	-	-	-
Azam et al.21	67	19	-	-	- 1		-	-	-
Neuman ²²	75	8	5		4 (intraop)	I	-	2.7	-
Karram et al. ²³	350	4.9	4.9	-	0.9 (major bleed)	0.9	10.9	0.9	1.7

Schulz JA, Chan MC, Farrell SA; Sub-Committee on Urogynaecology. Midurethral Minimally Invasive Sling Procedures for Stress Urinary Incontinence. J Obstet Gynaecol Can. 2008 Aug; 30(8):728-40.

TOT



Introduction of TOT in 2001

+Safer option introduced

• Urologie de la femme

Progrès en Urologie (2001), 11, 1306-1313

La bandelette trans-obturatrice : un procédé mini-invasif pour traiter l'incontinence urinaire d'effort de la femme

Emmanuel DELORME

Urologie, Châlon sur Saône, France

Outcomes TOT

Table 3. TOT cure rates

Author	N	Patient group	Duration of follow-up	Treatment outcomes (% cured)
Giberti et al. ³³	108	stress urinary incontinence due to urethral hypermobility	2 years	80
Cindolo et al. ³⁴	80	stress urinary incontinence with urethral hypermobility	4 months	92
Roumeguere et al.35	120	Urodynamic stress	1 year	80
Waltregny et al.36	91		3 year	88

Complications TOT

Table 4. TOT complications

Author	N	Postop urge (%)	Dyspareunia (%)	Vaginal erosions (%)	Sling rejection (%)	High thigh pain (%)	Retention (%)	Postop void dysfunction (%)
Giberti et al.33	108	14.8	7.3	6.4	3.8	-	-	-
Meschia43	231	-	-	-	-	5	-	-
Waltregny et al.36	91	-	-	-	-	- 1	4	-
Delorme ⁶	32	6.25	-	-	-		3.13	15.63
Dobson et al.42	52	-	-	9.6	-	26	-	-

Single Incision Midurethral Slings (SIMS)



SIMS

- SIMS fundamentally differs from SMUS because they have a shorter trajectory of insertion and therefore need a robust anchoring mechanism to the obturator complex with a strong postinsertion pullout force.
- All currently available SIMS share the same tape material (type 1 polypropylene) and the insertion technique through a single vaginal incision; however, they differ in the type/robustness of the anchorage mechanism used

Rational for introducing SIMS

1- Shorter length polypropylene tape => less foreign material being inserted into human body => reducing the adverse reactions to foreign material

2- Small trauma to the patient => insertion through a single vaginal incision to create a similar suburethral hammock to standard midurethral slings (SMUS)

3-Avoiding both retropubic and groin trajectories => prevents having bladder, obturator nerves, and blood vessels in the puncture path \rightarrow safer than the traditional slings TVT and TOT

4- the ability to perform the procedure under pure local anesthesia and therefore a shorter recovery and earlier return to work/ normal activities

European urology 2014







Step 1. Locate and make a midurethral vaginal incision of approximately 1.5 cm.



Step 2. Dissect bilaterally up to the interior portion of the inferior pubic ramus (1 -1.5 cm).



Step 3. To visualize needle insertion orientation, locate insertion of adductor longus tendon on the patient's pubic ramus. Palpate the notch along the internal edge of ischiopubic ramus where the adductor longus tendon and the inferior pubic ramus meet. The needle insertion should be aimed at the location of this notch.



Step 4. Place one of the integrated self-fixating tips onto the needle by sliding it over the end of the needle. Ensure that the integrated self-fixating tip is oriented such that the mesh wraps along the outside of the needle bend.



Step 5. Insert the needle/sling assembly toward the location identified in Step 3 such that the flat of the handle is perpendicular to the desired path. Track the needle along the posterior surface of the ischiopubic ramus until the midline mark on the mesh is approximately at the midline position under the urethra.



Step 6. Remove the needle and repeat on the contralateral side until the appropriate sling tension under the urethra is achieved. Ensure that the mesh lays flat.

Step 7.

Remove needle and close vaginal incision.

Evolution of Miniarc





Ajust

- + The Ajust sling is one of the single-incision vaginal slings that appeared on the market in 2009
- + Its puncture method is to use a specially designed anchor to fix the sling on the obturator membrane without letting both ends penetrate through the skin.
- After implantation, the tightness of the sling is adjusted through the device.


















Cost effectiveness

The adjustable anchored SIMS (Ajust), performed under local anesthesia, delivers cost savings to the health service provider when compared with the SMUS (TVT-O) Average of 142 £ less cost

Comparison of an adjustable anchored single-incision mini-sling, Ajust[®], with a standard mid-urethral sling, TVT-O[™]: a health economic evaluation

Dwayne Boyers*[†], Mary Kilonzo^{*}, Alyaa Mostafa[‡] and Mohamed Abdel-Fattah[‡]

*Health Economics Research Unit and [†]Health Services Research Unit, and [‡]Division of Applied Health Sciences, University of Aberdeen, Aberdeen, UK



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In Short: Complications of MUS

Complications post MUS

+ INTRAOP Complications:

- + Bladder perforation : 38/1000
- + Active bleeding (blood loss >200 ml) : 19/1000
- + Injury to major vessels : 19/1000
- + POSTOP Complications
 - + Retropubic hematoma : 19/1000
 - + Minor post-operative voiding difficulty : 76/1000
 - Post-operative urine retention : 23/1000
 - + Postoperative urinary tract infection : 41/1000
 - Defect in vaginal healing : 7/1000
 - Complications requiring laparotomy : 3.4/1000
 - + SLING erosion

Incont Pelvic Floor Dysfunct 2008; 2(2):53-60

Urine retention and/or voiding dysfunction

- + Usually caused by **undue tension**
- + Sx = hesitancy, straining to void, incomplete emptying, and increased post-voidal residuals
- + Bladder outlet obstruction and high pressure with low flow in urodynamic studies
- + Incidence rate = 1-17 % for voiding disturbances, o-3 % for urinary retention

+ Management of retention →

- + transvaginal transection or loosening
- + urethral dilatation using Hegar dilatation
- + lateral excision

Bladder perforation

- + Incidence = **0 25** %
- + Risk factors = previous pelvic surgery, repeated antiincontinence surgery esp. previous colposuspension
- + More frequent with retropubic approach (9.5 vs 0%, p = 0.03 ; David-Montefiore 2006)
- + Unrecognized bladder injuries also reported with TOT
- + Some authors recommend routine CYSTOSCOPY for TOT, particularly in outside-in approach (*Minaglia 2004*)

Sling erosion

- + " Presence of foreign material within the genitourinary tract "
- Sx= persistant vaginal discharge, partner discomfort during intercourse, or asymptomatic
- + Incidence = 0.3 23 %
- + Vaginal or bladder exposure
- + Complications from type I material is RARE (0.2- 1.2 %)
- + **Type III (multifilament) = > 7.5 14 %** (*Baessler 2005*)
- + Most studies => complete removal of eroded tape
- Conservative mangement is an alternative => cautious observation, reepithelialization usually occurs within 6 weeks; if no overgrowth in 3 months, excision of eroded sling should be considered

Sling erosion

+ The risk of erosion, extrusion and infection after midurethral multifilament microporous IVS tape implantation is too high which is the reason <u>why it should no longer be used</u>. Outline: Mid urethral Tapes for Stress Urinary Incontinence

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What to use, when and what are the advantages and drawbacks: Metaanalysis and RCT results



Midurethral sling (MUS) vs. Burch

 NO DIFFERENCE between the 2 surgeries with regard to objective cure, subjective cure, quality-of-life, or sexual function outcomes

TABLE 4

Society for Gynecologic Surgeons Systematic Review Group sling surgery for stress urinary incontinence in women, clinical practice guidelines

Midurethral sling vs Burch (open or laparoscopic)

For women considering midurethral slings or Burch procedures for treatment of SUI, we suggest either intervention for objective and subjective cure and that decision be based on: (1) which adverse events are of greatest concern to patient; and (2) any other planned concomitant surgeries (vaginal vs abdominal route). (1A)

Am J Obstet Gynecol. 2014 Jul;211(1):71.e1-71.e27.

Midurethral sling (MUS) vs. Burch

- + MUS => lower rates of **PERIOPERATIVE** adverse effects :
 - + postoperative pain
 - + operating room time
 - + hospital stay
 - + bowel injury
 - + wound infection
 - + hematomas

+ Burch procedures => lower rates of LONGER-TERM adverse effects :

 return to the operating room for retention or erosion, overactive bladder (OAB) symptoms, and groin pain

Am J Obstet Gynecol. 2014 Jul;211(1):71.e1-71.e27

Pubovaginal slings v/s MUS

Pubovaginal slings vs MUS

The only MUS included in these studies was a retropubic TVT sling



Pubovaginal slings vs MUS

+ MUS => lower rates of :

- + operating room time
- + blood loss
- + transfusion
- + wound infection
- + retention
- + OAB symptoms
- + hospital stay
- + Pubovaginal slings => lower rates of :
 - + urinary tract infection and vaginal perforation

Am J Obstet Gynecol. 2014 Jul;211(1):71.e1-

71.e27

Retropubic v/s Obturator MUS

Retropubic MUS vs obturator MUS

+ 21 RCTs

FIGURE 5

Metaanalysis for objective cure: retropubic (retro) vs obturator midurethral slings

FIGURE 6



For women considering **retropubic or transobturator** midurethral sling, we recommend **either intervention** for objective and subjective cure and that decision be based on which *adverse events* are of greatest concern to patient. (1A) **Am J Obstet Gynecol. 2014**

Retropubic MUS vs obturator MUS

- + Postoperative OAB symptoms were more common in patients following retropubic slings (OR, 1.41; 95% Cl, 1.01-1.98, P = .046)
- + **Retropubic slings** result in lower absolute rates of:
 - + sling erosion, need to return to the operating room for treatment of sling erosion, nerve injury, ureteral injury, groin/leg pain, and vaginal perforation

- + Obturator MUS result in :
 - shorter operative time, lower blood loss, fewer bladder/urethral perforations, less perioperative pain, fewer urinary tract infections, and less OAB symptoms

Am J Obstet Gynecol. 2014



Mid-urethral sling operations for stress urinary incontinence in women (Review)

Ford AA, Rogerson L, Cody JD, Ogah J

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2015, Issue 7

Transobturator (TOR) versus retropubic route (RPR)

- + Similar subjective cure rates : 83.3 % (according to 36 trials)
- + Shorter operative time post by an average of 7 minutes with TOR compared to RPR
- + Length of stay shorter by an average of **0.17 days** with **TOR** compared with RPR

	TOR	RPR	Relative risk
Retropubic hematoma		Х	RR 0.33 (28 trials)
Bowel perforation		Х	RR 0.33 (28 trials)
Bladder perforation		Х	RR 0.13 (40 trials)
Post voiding dysfunction		Х	RR 0.53 (37 trials)
Urgency and urinary incontinence	=	=	RR 0.98 (31 trials)
Vaginal tape erosion	=	=	RR 1.13 (31 trials)
Groin pain	Х		RR 4.12
Suprapubic pain		Х	RR 0.29



The Journal of Urology, Volume 193, Issue 3, 2015, 909–915 A Meta-Analysis of the Performance of Retropubic Mid Urethral Slings versus Transobturator Mid Urethral Slings

Odds ratio meta-analysis plot [fixed effects]

Odds ratio meta-analysis plot [fixed effects]

urodynamic findings before and after MUS: TVT v/s TVT-O

	Pre op	3 month	6 month
Variable			
ALPP			
MUP			
MUCP			

J Minim Invasive Gynecol. 2013 Jul-Aug;20(4):482-6



Retropubic bottom-to-top versus topto-bottom approach

- Subjective cure: women were significantly more often dry with the bottom-to-top approach (TVTTM) vs top-to-bottom (SPARCTM) (Kim 2004; Lim 2005; Lord 2006)
- + Objective sure : similar between 2 groups, [94.19% versus 89.10%; RR 1.06]
- + Adverse events:
 - + With bottom-to-top : fewer bladder perforation, voiding dysfunction and vaginal tape erosions



Obturator medial-to-lateral versus obturator lateral-to-medial approach

- No statistically significant difference between 2 approaches concerning objective and subjective cure rates (according to 6 trials)
- + Vaginal perforation less likely to occur with medial-tolateral approach (RR 0.25, 95% Cl 0.12 to 0.53)
- + Voiding dysfunction occurred significantly more in the medial-to- lateral compared to the lateral-to-medial group (RR 1.74, 95% Cl 1.06 to 2.8)

MUS v/s minisling

UROGYNECOLOGY

Sling surgery for stress urinary incontinence in women: a systematic review and metaanalysis

Megan O. Schimpf, MD; David D. Rahn, MD; Thomas L. Wheeler, MD, MSPH; Minita Patel, MD, MS; Amanda B. White, MD; Francisco J. Orejuela, MD; Sherif A. El-Nashar, MBBCh, MS; Rebecca U. Margulies, MD; Jonathan L. Gleason, MD; Sarit O. Aschkenazi, MD; Mamta M. Mamik, MD; Renée M. Ward, MD; Ethan M. Balk, MD, MPH; Vivian W. Sung, MD, MPH; for the Society of Gynecologic Surgeons Systematic Review Group

+ Comparison between MUS & SIMS

+ Majority of SIMS comparators were either TVT-Secure H of U

MUS vs Minisling

Metaanalysis for objective cure: traditional midurethral sling (MUS) vs minisling

FIGURE 8



FIGURE 9 Mataanalysis for <mark>subjective cure</mark>: traditional midural



Metaanalysis for subjective cure: traditional midurethral sling vs minisling

For women considering minislings (specifically TVT-Secur in H or U configuration) compared to traditional midurethral slings for treatment of SUI, we recommend traditional midurethral sling to maximize cure rates. (1A) Am J Obstet Gynecol. 2014

MUS vs Minisling

+ Considering Side Effects :

- + Minislings
 - + => similar rates of postoperative overactive bladder symptoms compared with obturator slings
 - + => lower rates compared with retropubic slings
- + Exposure of sling postoperatively is similar between obturator slings and minislings, but retropubic slings have lower rates than both other types. (1D)
- + Dyspareunia is more common with Minisling than either retropubic obturator sling, but absolute rates are low for all types of slings

Single incision vs Retropubic sling Objective measurement of incontinence

The Cochrane Library 2014, Issue 6

Study or subgro	oup Single	-incision slings	Retropubi	ic slings	R	lisk Ratio	Weig	ht Risk	Ratio
		n/N		n/N	M-H,Fix	ed,95% Cl		M-H,Fixed,95	5% CI
I Bottom-up approad	:h					_			
Andrada Hamer 2	012 SEC	20/60		5/61			69.2	% 4.07 [1.63, 10	0.13]
Basu 2010 ARC		13/37		2/30			30.8	% 5.27 [1.29, 2	1.56]
Subtotal (95% C Total events: 33 (Sing Heterogeneity: Chi ² : Test for overall effect: Test for subgroup diff	CI) le-incision slings), 7 (f = 0.09, df = 1 (P = 0 : Z = 3.80 (P = 0.000 erences: Not applicat	97 Retropubic slir (.76); I ² =0.0% () (4) ble	ngs)	91		•	100.0 9	% 4.44 [2.06, 9.	56]
							00		_
				favours Single-in	cision slings	favours retr	opubic slings		
Study or subgroup	Single-incision slings		Retropubic slings		Diffe	rence	Weight	Difference	
	N	Mean(SD)	N	Mean(SD)	IV,Rando	om,95% Cl		IV,Random,95% CI	
I Bottom-up approach									
Abdelwahab 2010 SEC	30	5.4 (11.6)	30	36.7 (8.6)	-		32.6 %	-31.30 [-36.47, -26.13]	
Barber 2012 SEC	133	26 (12)	127	28 (10)	-		33.6 %	-2.00 [-4.68, 0.68]	
Wang 2011 SEC	34	15.4 (1.4)	32	34.5 (6.3)	•		33.7 %	-19.10 [-21.33, -16.87]	
Subtotal (95% CI) Heterogeneity: Tau ² = 166 Test for overall effect: Z = 2 Test for subgroup difference	197 83; Chi ² = 140.10, df 2.30 (P = 0.021) es: Not applicable	r = 2 (P<0.000	189 D1); I ² =99%		•		100.0 % -17	7.33 [-32.09, -2.57]	
Duration	ofopera	ation		favours Single-ir	ncision slings) 50 I(favours retro	00 pubic slings		THE COCHRANE

Single incision vs Retropubic sling

De novo Urgency

COLLABORATION®

Study or subgroup	Single-incision slings	Retropubic slings		Risk Ratio	Weight	Risk Ratio	
	n/N	n/N	M-H,	Fixed,95% Cl		M-H,Fixed,95% Cl	
I Bottom-up approach							_
Abdelwahab 2010 SEC	4/30	2/29	-		18.2 %	1.93 [0.38, 9.76]	
Andrada Hamer 2012 SEC	11/61	4/62			35.6 %	2.80 [0.94, 8.30]	
Wang 2011 SEC	12/34	5/32			46.2 %	2.26 [0.90, 5.70]	
Subtotal (95% CI)	125	123		•	100.0 %	2.39 [1.25, 4.56]	
Total events: 27 (Single-incision	slings), II (Retropubic slings)						
Heterogeneity: Chi ² = 0.16, df :	= 2 (P = 0.92); I ² =0.0%						
Test for overall effect: Z = 2.64	(P = 0.0083)						
Test for subgroup differences: N	lot applicable						
		0	0.01 0.1	10 100			
		favours Single-	-incision slings	favours retrop	ubic slings		
				_			
Study or subgroup	Single-incision slings	Retropubic slings		Risk Ratio	Weight	Risk Ra	tio
	n/N	n/N	M-ł	H,Fixed,95% Cl		M-H,Fixed,95%	CI
I Bottom-up approach							
Barber 2012 SEC	2/136	4/127	_		88.7 %	0.47 [0.09, 2.5	1]
Basu 2010 ARC	9/37	0/33			→ II.3 %	17.00 [1.03, 281.2	2]
Subtotal (95% CI)	173	160		-	100.0 %	2.34 [0.79, 6.92	2]
Total events: 11 (Single-incisio	n slings), 4 (Retropubic slings)				-	-
Heterogeneity: Chi ² = 5.45, d	$If = I (P = 0.02); I^2 = 82\%$						
Test for overall effect: Z = 1.5	3 (P = 0.12)						
Test for subgroup differences:	Not applicable						
Depent etree							
Repeat stres	sincontine	ince	0.01 0.1		100		+)
curdory		favours Sing	le-incision sling	s favours retr	ropubic sling		
sorgery						THE CO	CHRANE

Single incision vs Retropubic sling

+ No significant differences between the two groups concerning

- + Operative blood loss
- + Length of in patient stay
- + Major vascular or visceral injury; vaginal wall perforation
- + Bladder or urethral perforation
- + Urinary retention and the need for catheterisation
- + Infection due to synthetic mesh; dyspareunia
- + Vaginal mesh exposure
- + Mesh extrusion into bladder or urethra
- + Need for any additional surgical procedure to treat complications



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Single incision v/s TVT-O Number of women with no improvement

Study or subgroup	Single-incision sling	Trans-obturator sling	F M_H Fiv	lisk Ratio	Weight	Risk Ratio M-H Fixed 95% C	
I Inside-out TVT-O						111,000,000 0	
Masata 2012 SEC	21/129	1/68			7.6 %	11.07 [1.52, 80.53	1
Oliveira 2011 ARC SEC	8/60	2/30	_	-	15.5 %	2.00 [0.45, 8.84	1
Seo 2011 SEC	7/41	2/39	-		11.9 %	3.33 [0.74, 15.06	1
Wang 2011 SEC	4/34	0/36	-	·	2.8 %	9.51 [0.53, 170.33	1
Subtotal (95% CI)	264	173		-	37.8 %	4.80 [2.00, 11.55]]
Total events: 40 (Single-incisio Heterogeneity: $Chi^2 = 2.46$, o Test for overall effect: $Z = 3.5$ 2 Outside-in TOT	n sling), 5 (Trans-obturat if = 3 (P = 0.48); I ² =0.0 I (P = 0.00045)	or sling) %	_		422.9	0761032 1 82	
Subtrate L (050) CT)	100	10105			62.2 %	0.76[0.32, 1.82	1
Total events: 8 (Single-incision Heterogeneity: not applicable Test for overall effect: $Z = 0.6$	sling), II (Trans-obturat	or sling)			02.2 70	0.70 [0.92, 1.62	1
Total (95% CI)	364	278		•	100.0 %	2.29 [1.29, 4.06]
Study or subgroup Sing	le-incision sling	Trans-obturator sling		Mean Difference	Weight	Mean Difference	-
	N Mean(S	D) N	Mean(SD)	IV,Fixed,95% CI		IV,Fixed,95% CI	
I Inside-out TVTO							
Hinoul 2011 SEC	96 74 (6	58) 92	59 <mark>(</mark> 51)		77.6 %	15.00 [-2.14, 32.14]	
Masata 2012 SEC	64 56.8 (129	.1) 68	24.9 (16.2)		22.4 %	31.90 [0.04, 63.76]	
Subtotal (95% CI) Heterogeneity: $Chi^2 = 0.84$, df Test for overall effect: $Z = 2.44$	160 F = 1 (P = 0.36); I ² =0.0% 4 (P = 0.015)	160		•	100.0 % 1	8.79 [3.70, 33.88]	
Test for subgroup differences:	e blood	loss	- 100 -5 Favours Single-inci	50 0 50 Ision Favours	100 Trans-obturator		

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Single incision v/s TVT-O

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Objective measurement of incontinence

Study or subgroup	Single-incision sling	Trans-obturator sling n/N	Risk Ratio M-H Fixed 95% CI	Weight	Risk Ratio M-H.Fixed,95% CI
I Inside-out TVT-O					
Bianchi 2012 SEC	18/66	11/56	+	14.6 %	1.39 [0.72, 2.69]
Hinoul 2011 SEC	12/75	2/85	—	2.3 %	6.80 [1.57, 29.41]
Hota 2012 SEC	23/42	4/44		4.8 %	6.02 [2.27, 15.95]
Mackintosh 2010 AJS	1/14	0/13		0.6 %	2.80 [0.12, 63.20]
Masata 2012 SEC	40/129	5/68		8.0 %	4.22 [1.75, 10.19]
Mostafa 2012 AJS	7/69	2/68		2.5 %	3.45 [0.74, 16.02]
Tommaselli 2010 SEC	7/38	6/37	-	7.5 %	1.14 [0.42, 3.06]
Subtotal (95% CI)	433	371	•	40.3 %	2.91 [2.00, 4.25]
Total events: 108 (Single-inc Heterogeneity: Chi ² = 12.4 Text for orce all effect: Z = 5 2 Outside-in TOT	cision sling), 30 (Trans-obturator 5, df = 6 (P = 0.05); I ² =52% 5.56 (P < 0.00001)	r sling)			
Djendian 2010 OPH	3/29	0/15		0.8 %	3.73 [0.21, 67.88]
Lee 2010 CUR/SEC	12/38	5/22	- - -	7.8 %	1.39 [0.56, 3.42]
Lee 2012 ARC	10/83	10/87	+	12.0 %	1.05 [0.46, 2.39]
Sivaslioglu 2012 TFS	30/36	27/36	+	33.1 %	1.11 [0.88, 1.41]
Smith 2011 ARC	6/24	5/24		6.1 %	1.20 [0.42, 3.41]
Subtotal (95% CI)	210	184	•	59. 7 %	1.18 [0.90, 1.55]
Total events: 61 (Single-incisi	ion sling), 47 (Trans-obturator s	ling)			
Heterogeneity: Chi ² = 1.05,	df = 4 (P = 0.90); I ² =0.0%				
Test for overall effect: $Z = I$.19 (P = 0.23)				
Total (95% CI)	643	555	*	100.0 %	1.88 [1.49, 2.36]
Total events: 169 (Single-inci	ision sling), 77 (Trans-obturator	sling)			
Heterogeneity: Chi ² = 36.01	$I, df = II (P = 0.00017); I^2 = 69$	9%			
Test for overall effect: $Z = 5$.41 (P < 0.00001)				
Test for subgroup difference	s: $Chi^2 = 14.62$, $df = 1$ (P = 0.0	00), I ² =93%			
		0.	01 0.1 0 100		
		Favours S	Engle-incision Favours Trans-	obturator	

	gle invision sling Trans-c	bturnor sling	Risk Ratio	Weight	Risk Ratio
	n/N	n/N	M-H,Fixed,95% Cl		M-H,Fixed,95% CI
nalmeshe	exposure	1/36		11.8 %	0.90 [0.06, 13.87]
Hinoul 2011 SEC	7/96	1/92	_ .	11.4 %	6.71 [0.84, 53.47]
Hota 2012 SEC	8/42	0/44		5.5 %	17.79 [1.06, 298.88]
Mostafa 2012 AIS	1/69	2/68		22.5 %	0.49 [0.05, 5.31]
Tommaselli 2010 SEC	1/37	0/38		5.5 %	3.08 [0.13, 73.25]
Subtotal (95% CI)	284	278	-	56.7 %	3.75 [1.42, 9.86]
Total events: 18 (Single-incision slin, Heterogeneity: Chi ² = 5.33, df = 4 Test for overall effect: Z = 2.68 (P 2 Outside-in TOT	g), 4 (Trans-obturator sling) (P = 0.25); l ² =25% = 0.0075)				
Djehdian 2010 OPH	4/29	1/15		14.7 %	2.07 [0.25, 16.91]
Lee 2010 CUR/SEC	0/38	0/22			Not estimable
Sivaslioglu 2012 TFS	0/36	1/36		16.8 %	0.33 [0.01, 7.92]
Smith 2011 ARC	1/43	1/38		11.9 %	0.88 [0.06, 13.65]
Total events: 5 (Single-incision sling) Heterogeneity: $Chi^2 = 0.92$, df = 2 Test for overall effect: Z = 0.10 (P Total (95% CI) Total events: 23 (Single-incision slin Heterogeneity: $Chi^2 = 7.30$, df = 7 Test for overall effect: Z = 2.44 (P Test for subgroup differences: Chi^2), 3 (Trans-obturator sling) (P = 0.63); ² =0.0% = 0.92) 430 g), 7 (Trans-obturator sling) (P = 0.40); ² =4% = 0.015) = 2.11, df = 1 (P = 0.15), ² =	389	-	100.0 %	2.59 [1.21, 5.56]
Tommaselli 2010 SEC	n or disco		01 0.1 10 100 Single-incision Favours Trans-	obturator 18.5 %	0.25 [0.02, 2.65] Not estimable
ubtotal (95% CI) tal events: I (Single-incision sling), 6 eterogeneity: Ch ² = 0.17, df = I (P st for overall effect: Z = 1.89 (P = 0 Outside-in TOT	131 (Trans-obturator sling) = 0.68); I ² =0.0% .059)	104		48.9 %	0.17 [0.03, 1.07]
Djehdian 2010 OPH	0/29	4/15	• • •	40.7 %	0.06 [0.00, 1.03]
Sivaslioglu 2012 TFS	0/36	1/36		10.4 %	0.33 [0.01, 7.92]
ubtotal (95% CI) tal events: 0 (Single-incision sling), 5 leterogeneity: $Ch^{2} = 0.64$, $df = 1$ (P	65 (Trans-obturator sling) = 0.42); ² =0.0%	51		51.1 %	0.12 [0.02, 0.82]
iotal (95% CI) iotal events: I (Single-incision sling), I	196 I (Trans-obturator sling)	155		100.0 %	0.14 [0.04, 0.54]
Single incision v/s TVT-O

Repeat stress incontinence surgery

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8/42	0/44		5.1 %	17.79 [1.06, 298.88]
15/129	0/68		6.8 %	16.45 [1.00, 270.85]
5/69	3/68		31.3 %	1.64 [0.41, 6.61]
240	180	-	43.1 %	5.86 [2.00, 17.21]
ng), 3 (Trans-obturator sling) 2 (P = 0.11); 1 ² =54% P = 0.0013)				
3/112	2/112		20.7 %	1.50 [0.26, 8.81]
0/36	1/36		15.5 %	0.33 [0.01, 7.92]
2/24	2/24		20.7 %	1.00 [0.15, 6.53]
172 g), 5 (Trans-obturator sling) 2 (P = 0.72); I ² =0.0% = 1.0)	172	-	56.9 %	1.00 [0.31, 3.18]
412 ng), 8 (Trans-obturator sling) 5 (P = 0.18); l ² =34% P = 0.0028) ² = 4.81, df = 1 (P = 0.03), l ²	352 =79%	-	100.0 %	3.09 [1.48, 6.49]
	8/42 15/129 5/69 240 ng), 3 (Trans-obturator sling) 2 (P = 0.11); $l^2 = 54\%$ 2 = 0.0013) 3/112 0/36 2/24 172 g), 5 (Trans-obturator sling) 2 (P = 0.72); $l^2 = 0.0\%$ = 1.0) 412 ng), 8 (Trans-obturator sling) 5 (P = 0.18); $l^2 = 34\%$ 2 = 0.0028) 2 = 4.81, df = 1 (P = 0.03), l^2	$8/42$ $0/44$ $15/129$ $0/68$ $5/69$ $3/68$ 240 180 ng), 3 (Trans-obturator sling) $2(P = 0.11); 1^2 = 54\%$ $2 = 0.0013$ $3/112$ $2/112$ $0/36$ $1/36$ $ 2/24$ $2/24$ $2/24$ 172 172 172 g), 5 (Trans-obturator sling) $2 (P = 0.72); 1^2 = 0.0\%$ $= 1.0$ 412 352 352 ng), 8 (Trans-obturator sling) $5 (P = 0.18); 1^2 = 34\%$ $P = 0.0028$ $2 = 4.81, df = 1 (P = 0.03), 1^2 = 79\%$ $P = 79\%$	$8/42$ $0/44$ $15/129$ $0/68$ $5/69$ $3/68$ 240 180 ng), 3 (Trans-obturator sling) $2(P = 0.11); 1^2 = 54\%$ $2 = 0.0013$ $3/112$ $3/112$ $2/112$ $0/36$ $1/36$ $2/24$ $2/24$ 172 172 $g), 5$ (Trans-obturator sling) $2 (P = 0.72); 1^2 = 0.0\%$ $= 1.0$ 412 352 ng), 8 (Trans-obturator sling) $5 (P = 0.18); 1^2 = 34\%$ $2 = 0.028$ $2 = 4.81, df = 1 (P = 0.03), 1^2 = 79\%$	$8/42$ $0/44$ 5.1% $15/129$ $0/68$ 6.8% $5/69$ $3/68$ 31.3% 240 180 43.1% ng), 3 (Trans-obturator sling) $2(P = 0.11); 1^2 = 54\%$ 43.1% $2(P = 0.11); 1^2 = 54\%$ $2/112$ 20.7% $0/36$ $1/36$ 15.5% $2/24$ $2/24$ 20.7% 172 172 56.9% $g), 5$ (Trans-obturator sling) $2(P = 0.72); 1^2 = 0.0\%$ 100.0% 1.0 412 352 100.0% $g), 8$ (Trans-obturator sling) $5(P = 0.18); 1^2 = 34\%$ 100.0% $2 = 4.81, df = 1$ ($P = 0.03$, $1^2 = 79\%$ $2 = 79\%$ 100.0%

0.01 0.1

Need for additional surgery to treat complications

I Inside-out TVT-O					
Friedman 2009 SEC	2/42	0/42		3.6 %	5.00 [0.25, 101.11]
Hinoul 2011 SEC	8/96	3/92		21.9 %	2.56 [0.70, 9.34]
Hota 2012 SEC	8/42	0/44		→ 3.5 %	17.79 [1.06, 298.88]
Masata 2012 SEC	3/129	2/68		18.7 %	0.79 [0.14, 4.62]
Oliveira 2011 ARC SEC	0/60	2/30		23.7 %	0.10 [0.01, 2.05]
Subtotal (95% CI)	369	276	-	71.4 %	2.15 [1.04, 4.43]
Heterogeneity: $Chi^2 = 7.72$, df = 4 (F Test for overall effect: Z = 2.07 (P = 2 2 Outside-in TOT	P = 0.10); l ² =48% 0.039)				
Lee 2012 ARC	3/112	2/112		14.3 %	1.50 [0.26, 8.81]
Sivaslioglu 2012 TFS	2/36	1/36		7.1 %	2.00 [0.19, 21.09]
Smith 2011 ARC	2/24	1/24		7.1 %	2.00 [0.19, 20.61]
Subtotal (95% CI) Total events: 7 (Single-incision sling), 4 Heterogeneity: Chi ² = 0.05, df = 2 (F Test for overall effect: $Z = 0.91$ (P =	172 (Trans-obturator sling) $P = 0.97$; $ ^2 = 0.0\%$ 0.36)	172		28.6 %	1.75 [0.52, 5.85]
Total (95% CI)	541	448	-	100.0 %	2.03 [1.09, 3.78
Total events: 28 (Single-incision sling), Heterogeneity: $Chi^2 = 7.76$, df = 7 (F Test for overall effect: Z = 2.24 (P = Test for subgroup differences: $Chi^2 =$	 11 (Trans-obturator sling) P = 0.35); I² = 10% 0.025) 0.08, df = 1 (P = 0.78), I² 	=0.0%			
		0.00	5 0.1		

Single incision vs Transobturator sling

+ No significant differences between the two groups concerning :

- + Length of in patient stay
- + Major vascular or visceral injury
- + Bladder or urethral perforation
- + Vaginal wall perforation
- + Urinary retention and the need for catheterisation
- + Infection related to the use of synthetic mesh
- + De novo urgency





Platinum Priority – Review – Female Urology – Incontinence Editorial by Maurizio Serati on pp. 428–429 of this issue

Single-Incision Mini-Slings Versus Standard Midurethral Slings in Surgical Management of Female Stress Urinary Incontinence: An Updated Systematic Review and Meta-analysis of Effectiveness and Complications

Alyaa Mostafa^a, Chou Phay Lim^b, Laura Hopper^a, Priya Madhuvrata^c, Mohamed Abdel-Fattah^{a,*}

^a University of Aberdeen, Aberdeen, UK; ^b Aberdeen Royal Infirmary, Aberdeen, UK; ^c Sheffield Teaching Hospital NHS Foundation Trust, Sheffield, UK

A total of **26 RCTs including 3308 women** (SMUS: n = 1573 vs SIMS: = 1735)

SIMS were compared with **RP-TVT in 4 RCTs** and **TO-TVT** in 22 RCTs

NO EVIDENCE of significant differences in patient-reported cure (RR: 0.94; 95% Cl, 0.88–1.00) and objective cure (RR: 0.98; 95% Cl, 0.94–1.01) for SIMS versus SMUS at a mean follow-up of 18.6 months

a)	SIMS		SMUS	5		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random (95% Cl	M-H, Random (95% CI)
23.1.1 Ajust vs SMUS							
Mostafa 2012	58	69	53	62	10.1%	0.98 (0.85-1.14)	
Schweitzer 2012	65	81	38	46	8.5%	0.97 (0.82-1.15)	
Subtotal (95% CI)		150		108	18.6%	0.98 (0.88-1.09)	+
Total events	123		91				
Heterogeneity: Tau ² = 0	.00; chi-s	quare :	= 0.01, df	= 1 (p	= 0.91); l ²	= 0%	
Test for overall effect: Z	= 0.39 (p	= 0.70))				
23.1.2 Mini-arc vs SML	JS						
Basu 2012	19	38	30	33	3.2%	0.55 (0.39-0.77)	+
Lee. J. 2013	73	88	78	85	12.6%	0.90 (0.81-1.01)	
Oliveira 2011	26	30	24	30	5.9%	1.08 (0.86-1.36)	
Schellart 2013	71	78	73	77	15.0%	0.96 (0.88-1.05)	
Tieu 2013	20	41	31	42	2.8%	0.66 (0.46-0.95)	<
Subtotal (95% CI)		275		267	39.4%	0.85 (0.71-1.02)	-
Total events	209		236				
Heteropeneity: Tau? = 0	1.03: chi-e	cuare -	19.58	f = 4 /	a = 0.0006	i): I? = 80%	
Test for overall effect 2	= 1.79 /	= 0.07)			n,	
. add the section structly &		3141	<i>'</i>				
23.1.3 Ophira vs SMUS	8						
Djehdian 2012	56	64	54	56	13.3%	0.91 (0.82-1.01)	-
Subtotal (95% CI)		64		56	13.3%	0.91 (0.82-1.01)	-
Total events	56		54				
Heterogeneity: Not appl	licable						
Test for overall effect: Z	:= 1.81 (p	= 0.07	")				
23.1.4 TFS vs SMUS							
Sivaslioglu 2012	35	39	32	39	7.9%	1.09 (0.91-1.31)	—
Subtotal (95% CI)	00	39		39	7.9%	1.09 (0.91-1.31)	
Total events	35		32				
Heterogeneity: Not appl	licable						
Test for overall effect: Z	e = 0.97 (p	= 0.33	0				
			_				
23.1.5 Needleless-Con	itasure vi	SMU	5	100	10 501		
Amat Tardiu 2011	129	130	106	108	18.0%	0.97 (0.92-1.01)	<u> </u>
Tatal cupatr	100	190		100	10.076	0.07 (0.02-1.01)	1
rotal events	129		106				
Neterogeneity: Not appl							
lest for overall effect 2	= 1.43 (p	= 0.10	9				
23.1.6 Solyx vs SMUS							
Gopinath 2012	11	15	11	14	2.2%	0.93 (0.62-1.41)	
Subtotal (95% CI)		15		14	2.2%	0.93 (0.62-1.41)	
Fotal events	11		11				
Heterogeneity: Not appl	licable						
Test for overall effect Z	= 0.33 (p	= 0.74)				
Total (95% Ci)		679		592	100.0%	0.94 (0.88-1.00)	•
Total quants	603	0/0	600	0.0 K	1001074	0.04 (0.00-1.00)	•
rotal events	003		030	1 - 10	(n = 0.044		
neterogeneity: Tau* = 0	LUT; Chi-S	quare	- 23.22, 0	ii = 10	(p = 0.010	n, r = 07%	
Look for output official in			1				

(a)	5	SIMS		:	SMUS			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random (95% CI)	IV, Random (95% CI)
9.1.1 SIMS vs SMUS									
Djehdian 2012	28.1	12.8	69	27.3	9.4	61	5.1%	0.80 (-3.03 to 4.63)	
Gopinath 2012	24.6	7.29	15	33.43	10.03	15	3.2%	-8.83 (–15.10 to –2.56) ←	
Lee. J. 2013	8.82	5.16	100	10.95	5.37	105	7.2%	-2.13 (-3.57 to -0.69)	
Mostafa 2012	32.22	9.02	69	33.82	9.06	68	5.8%	-1.60 (-4.63 to 1.43)	
Schweitzer 2012	9.15	3.7	81	11.02	2.3	46	7.5%	-1.87 (-2.91 to -0.83)	
Sivaslioglu 2012	6	1	39	12	2	39	7.6%	-6.00 (-6.70 to -5.30)	
Tieu 2013	7.6	4.6	41	10.4	4	42	6.9%	-2.80 (-4.66 to -0.94)	-
Subtotal (95% CI)			414			376	43.3%	-2.95 (–5.02 to –0.88) 🥌	
Heterogeneity: Tau ² =	6.06; ch	ii-squa	ire = 65	.81, df =	= 6 (p <	0.0000	1); l² = 91	%	
Test for overall effect:	Z = 2.79) (p = (0.005)						
9.1.2 TVT-Secur vs S	MUS								
Barber 2012	26	12	136	28	10	127	6.2%	-2.00 (-4.66 to 0.66)	•
Bianchi 2013	20	5	66	22	6	56	6.8%	-2.00 (-3.98 to 0.02)	
Hinoul 2011	18	7	97	16	6	98	6.9%	2.00 (0.17 to 3.83)	
Masata 2012	10.8	4.4	129	8.3	3.5	68	7.4%	2.50 (1.37 to 3.63)	-
Pushkar 2011	15	7	45	17	2	50	6.7%	-2.00 (-4.12 to 0.12)	
Tommaselli 2010	7.1	2.1	42	11.3	2.9	42	7.5%	-4.20 (–5.28 to –3.12) ←	-
Tommaselli 2013	7.8	2.5	77	12	3.1	77	7.6%	-4.20 (-5.09 to -3.31)	-
wang 2011	15.4	1.4	34	16.2	1.5	36	7.6%	-0.80 (-1.48 to -0.12)	-
Subtotal (95% CI)			626			554	56.7%	-1.34 (-3.22 to 0.53)	
Heterogeneity: Tau ² =	6.65; ch	ii-squa	ire = 12	6.38, df	= 7 (p ·	< 0.000	01); l² = 9	4%	
Test for overall effect:	Z = 1.40) (p = (0.16)						
Total (95% CI)			1040			930	100.0%	-2.04 (-3.51 to -0.58)	. 🔶 🔛
Heterogeneity: Tau ² =	7.20; ch	ii-squa	re = 25	1.32, df	= 14 (p	< 0.00	001); l² =	94%	
Test for overall effect:	Z = 2.73) (p = (0.006)						avours SIMS avours SMUS
Test for subgroup diffe	rences:	chi-sq	uare =	1.27, df	= 1 (p :	= 0.26),	l² = 21.19	%	

SIMS were associated with significantly shorter operative time (- **2.95** min: 95% Cl, - 5.02 to - 0.88)

Single-Incision Mini-Slings Versus Standard Midurethral Slings in Surgical Management of Female Stress Urinary Incontinence: An Updated Systematic Review and Meta-analysis of Effectiveness and Complications

Alyaa Mostafa^a, Chou Phay Lim^b, Laura Hopper^a, Priya Madhuvrata^c, Mohamed Abdel-Fattah^{a,*}

^a University of Aberdeen, Aberdeen, UK; ^b Aberdeen Royal Infirmary, Aberdeen, UK; ^c Sheffield Teaching Hospital NHS Foundation Trust, Sheffield, UK

+ No statistically significant difference in the rate of :

- + Lower urinary tract injury
- + Postoperative voiding difficulties
- + Vaginal tape erosions
- + De novo urgency, and/or worsening of preexisting urgency

+ But the groin pain rate was significantly lower in the SIMS group (RR: 0.30; 95% Cl, 0.18–0.49).

RESEARCH ARTICLE



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Meta-analysis of female stress urinary incontinence treatments with adjustable single-incision mini-slings and transobturator tension-free vaginal tape surgeries

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SIMS- Ajust vs TVT-O / TOT

	SIMS-Ajust TVT-O/TOT		Risk Ratio			Risk Ratio			
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI	<u></u>	M-H, Fixe	d, 95% Cl
Schweitzer K 2012	65	81	38	46	27.3%	0.97 [0.82, 1.15]			
Alyaa Mostafa 2013	53	69	58	68	32.9%	0.90 [0.77, 1.06]			-
Grigoriadis C 2013	69	85	71	86	39.8%	0.98 [0.85, 1.13]			
Total (95% CI)		235		200	100.0%	0.95 [0.87, 1.04]		-	-
Total events	187		167						
Heterogeneity: Chi2 =	0.70, df=	2 (P =	0.70); I ² =	0%			0.5	0.7	1.5
Test for overall effect	Z=1.05 (P = 0.3	0)				0.5	Favors TVT-O/TOT	Favors SSIMS-Ajust

No significant difference in the patient-reported cure rate and objective cure rate between SIMS-Ajust and TVT-O/TOT.



+ SIMS-Ajust has a **shorter operation time** than TVT-O/TOT

[WMD = -1.61 min, 95% CI(-2.48 to -0.88), P < 0.05]





No significant difference in the incidence rate of repeated continence surgery between these two groups [RR = 1.64, 95 % CI (0.41 to 6.61), P > 0.05], f/u longer than 12 months in both

- + Postoperative groin pain by SIMS-Ajust is significantly less than for TVT-O/TOT [RR = 0.30, 95 % CI (0.11 to 0.85), <0.05
- + No significant difference between the two operations concerning (p > 0.05)
 - + lower urinary tract injuries
 - + postoperative voiding difficulties
 - + de novo urgency and/or worsening of preexisting surgery
 - + vaginal tape erosion

 One must note that the CI in this metaanalysis was wide and more patients are needed in order to confirm these results concerning Ajust

Sims v/s Sims

One single-incision sling versus another Primary outcomes

	Number of women with urinary incontinence	Number of women with no improvement	Objective measurement of Incontinence	Quality of life
TVT-secur vs Miniarc	=	=		
U-type vs H- type TVT- Secur	=	=	=	=
Miniarc vs Ajust	=	=	=	=



One single-incision sling versus another Surgical outcome measures

	Duration of operation	Operative blood loss
TVT-secur vs Miniarc	=	=
Miniarc vs Ajust	=	=



One single-incision sling versus another Adverse events

	Major vascular or visceral injury	Bladder or urethral perforation	Vaginal erosion or perforation	Urinary retention	Postoperative pain and discomfort	De novo urgency
TVT- secur vs Miniarc		=	=	=	=	=
U-type vs H- type TVT- Secur	=	=	=	=		=
Miniarc vs Ajust				=	=	=

THE COCHRANE COLLABORATION

To conclude

- The most common procedure for surgical treatment of SUI is the standard mid-urethral slings (SMUS), including retropubic tensionfree vaginal tape (RP-TVT) and transobturator tension-free vaginal tape (TO-TVT)
- The main complication of RP-TVT is the intraoperative bladder injury
- The main concern of TO- TVT is the postoperative pain in the inner thigh
- Mini-sling might be as effective as MUS when selecting the anchor type, less adverse effects (groin pain), less costs (local anesthesia)