

Comparison of midurethral tape with autologous rectus fascial sling surgery for stress urinary incontinence: A systematic review and meta-analysis

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Abstract

Objectives: To compare the success rates of autologous fascial mesh (sling and transobturator tape [TOT]) with midurethral synthetic meshes (tension-free vaginal tape sling [TVT] and TOT) for stress urinary incontinence.

Materials and methods: A literature search for studies published in English was conducted from May 10, 2022, to June 1, 2022. The search included MEDLINE/PubMed, Cochrane Library, Scopus, Web of Science, Google Scholar, and ProQuest, using the terms{"Autologous fascial slings"}OR {"AFS"} AND{"TOT"} OR {"Transobturator tape"} OR{"TVT"} OR{"Transvaginal tape"}. A total of 20 studies, including 10 randomized controlled trials, were selected for the review. RevMan software (version 5.3) was used to calculate the pooled effect estimates for operative and postoperative variables.

Results: In the systemic review, 20 studies, including 10 randomized controlled trials, were assessed. In the TVT versus autologous pubovaginal sling (A-PVS) groups, the effect estimates for the surgical duration, catheter duration, success, and complication rates were more advantageous for TVT. However, in comparison to autologous transobturator tape groups, TOT provided better operative time and a shorter hospital stay. Moreover, in comparison to the A-PVS group, the TOT group was superior in terms of operating time, urethral catheterization, hospital stay, amount of residual urine, and wound complications. The A-PVS group had significantly more groin and thigh pain.

Conclusions: During medium- and long-term follow-ups, the use of autologous rectus fascia grafts using a A-PVS or TOT provided similar complication rates and urinary continence results as using midurethral synthetic meshes (TVT and TOT).

Keywords: Autologous fascial sling; Transobturator tape; Transvaginal tape

1. Introduction

Most patients with stress urinary incontinence (SUI), especially those with moderate to severe SUI, require surgical treatment. Many procedures for the treatment of SUI have been described.

Although no strong evidence favoring any particular procedure exists, the best available data support the use of midurethral tape procedures, colposuspension, and autologous fascial slings (AFSs).^[1,2] In the last 2 decades, midurethral sling placement using a synthetic surgical mesh has been considered the criterion-standard surgical procedure for uncomplicated SUI or index patients after the failure of conservative treatments.^[3]

Tension-free vaginal polypropylene tape (TVT), introduced by Ulmsten and Petros,^[4] carries a high risk of bladder injury and requires cystoscopy. Delorme^[5] described an easier transobturator tape (TOT) with no requirement for cystoscopy and a low risk of bladder injury.

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However, owing to concerns regarding mesh erosion due to artificial tapes, there is a great reluctance to use them. Moreover, they are no longer available in many countries, causing a renaissance in the use of autologous rectus fascia slings for SUI.^[6] The use of rectus fascia slings below the bladder neck via the vaginal route, anchored superiorly to the abdominal wall, was proposed by Aldridge^[7] in 1942. The autologous pubovaginal sling (A-PVS) was popularized by McGuire and Lytton^[8] in 1978, who reported an 80% success rate in patients with intrinsic sphincter defects.

This systematic review and meta-analysis were performed to compare the pooled effect estimates for operative and postoperative variables related to autologous mesh methods (A-PVS and TOT) with synthetic midurethral tension-free methods (TVT and TOT) for SUI surgery. Moreover, the study aimed to allow the readers to choose the correct mesh for SUI surgery more easily.

2. Materials and methods

2.1. Methodology

This systematic review and meta-analysis followed the principles of the *Cochrane Handbook for Systematic Reviews of Interventions*, version 6, and the results were reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.^[9]

2.2. Research aim and objectives

This systematic review and meta-analysis aimed to compare AFS with midurethral tapes (TOT and TVT) in women with SUI.

2.3. Inclusion criteria for studies

2.3.1. Types of studies Observational (cohort or case-control) studies and clinical trials were included in this systematic review and meta-analysis. The search was restricted to studies published in English between January 1, 2000, and June 1, 2022.

2.3.2. Participants Studies included adult women who underwent surgery for SUI.

2.3.3. Interventions Eligible studies included a direct comparison between patient groups undergoing AFS placement and those undergoing TOT or TVT surgery.

2.4. Exclusion criteria

The following types of publications were excluded: conference abstracts/posters, duplicate reports, case reports, review articles, editorials, commentaries, and clinical guidelines. In addition, studies conducted on animals or patients younger than 18 years and those that did not include a direct comparison between both types of interventions were excluded.

2.5. Search strategy

2.5.1. Electronic searches The MEDLINE/PubMed, Cochrane Library, Scopus, Web of Science, Google Scholar, and ProQuest electronic databases were searched. The search was limited to studies published in English between January 1, 2000, and June 1, 2022, and was conducted from May 10, 2022, to June 1, 2022.

The search terms used were {"Autologous fascial slings"} AND {"TOT"} OR {"Transobturator tape"} OR {"TVT"} OR {"Transvaginal tape"}.

2.5.2. Other resources A search was conducted for potentially relevant studies identified from the reference lists of the studies retrieved from the electronic search.

2.6. Selection of studies

A single reviewer performed the search and screened the titles and abstracts of the retrieved studies. Thereafter, the reviewer retrieved the full texts of the studies with potentially relevant abstracts and evaluated their eligibility using the aforementioned inclusion and exclusion criteria. The reviewer then checked the search results, screened titles and abstracts, and reviewed the full texts of potentially eligible studies.

2.7. Data extraction

One reviewer extracted the relevant data from the included studies using a standardized data sheet. The extracted data included (a) study characteristics (country, study design, duration of the study, number of patients, and duration of follow-up after surgery); (b) patient characteristics (age, sex, body mass index, and comorbidities); (c) surgical details; and (d) postoperative complications. The collected data were verified by the reviewer to ensure consistency and clarity.

2.8. Assessment of the risk of bias in included studies

The risk of bias was assessed for the included studies by a reviewer using the National Institute for Health and Care Excellence checklist for cohort studies and randomized controlled trials (RCTs).^[10]

2.9. Data synthesis

Review Manager (RevMan version 5.4; The Cochrane Collaboration, London, United Kingdom, 2020) was used to perform the analysis, compute standardized metrics, and produce forest plots. For each comparison, the number of studies showing a positive direction of the effect and those with statistically significant effects are reported. Categorical dichotomous outcomes and continuous numerical variables were expressed as odds ratio (OR)/standardized mean difference (SMD), and the 95% confidence interval (CI) was calculated. The extracted data were tested for heterogeneity using the Cochrane χ^2 heterogeneity test and I^2 index. Significant heterogeneity across the studies was determined with a Cochrane χ^2 test with a value of $p < 0.1$ and an I^2 index $\geq 50\%$. If testing for heterogeneity yielded insignificant results, the extracted data were pooled using a fixed-effects model.^[11] If significant heterogeneity was detected, a random-effects model was used. To interpret the comparisons between the groups, $p < 0.05$ was considered significant.

3. Results

3.1. Results of literature search and study selection

The literature search yielded 830 articles. The process of screening titles, abstracts, and full-text studies is illustrated in the PRISMA 2020 flowchart (Fig. 1).

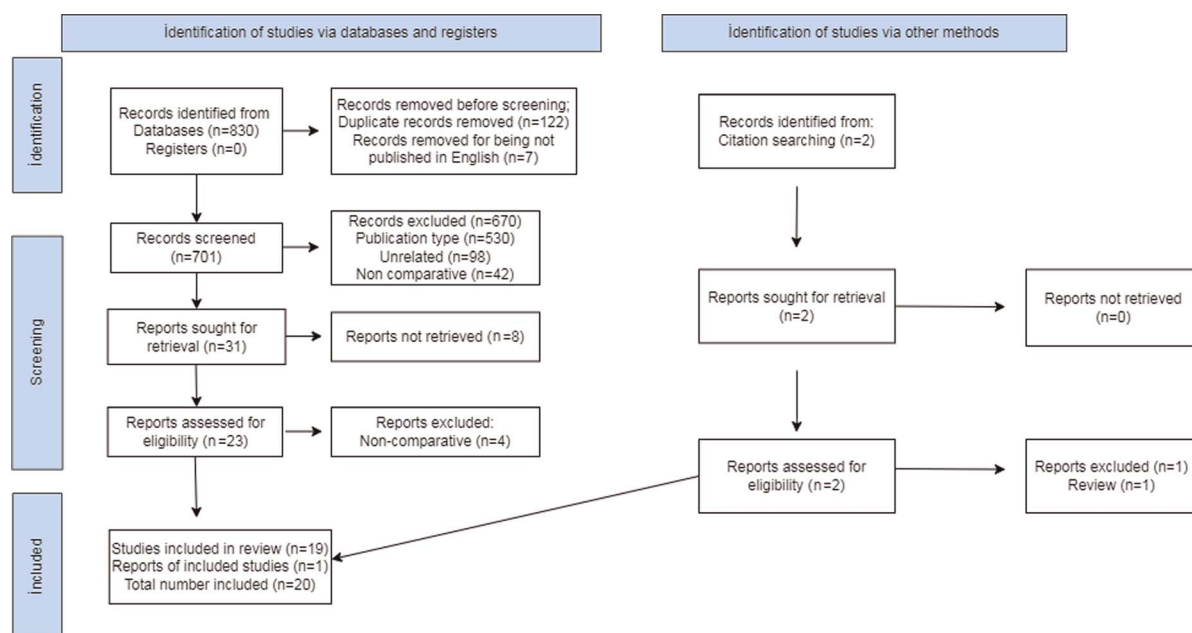


Figure 1. Flowchart of the study.

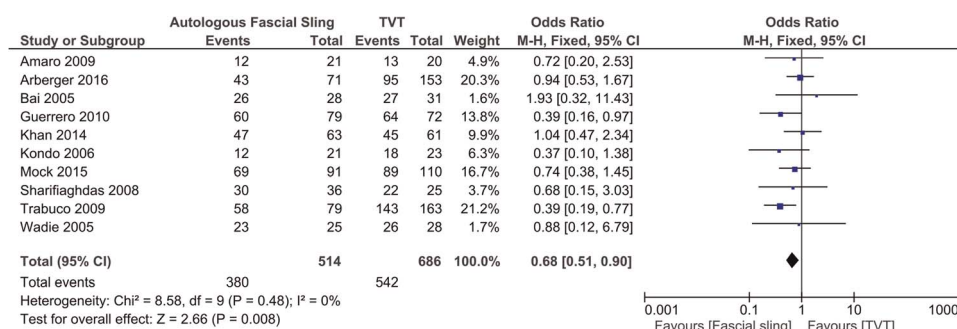


Figure 2. Forest plot pooled effect estimates for the outcome of TVT versus AFS success. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling.

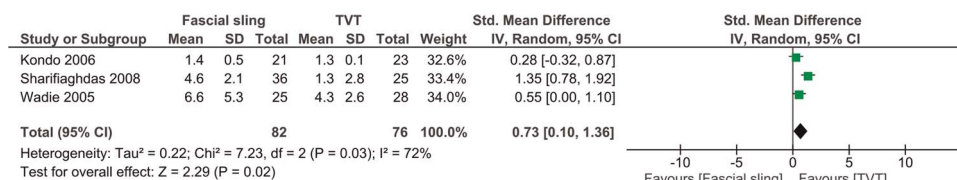


Figure 3. Forest plot pooled effect estimates for the outcome of TVT versus AFS catheterization time. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling.

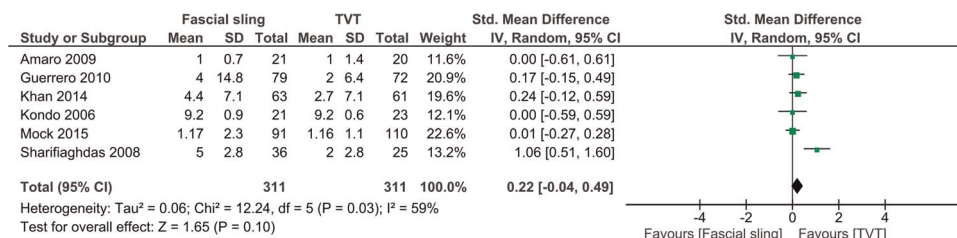


Figure 4. Forest plot pooled effect estimates for the outcome of TVT versus AFS hospital stay. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling.

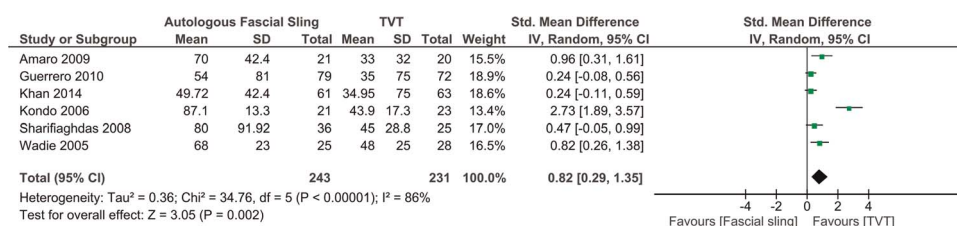


Figure 5. Forest plot pooled effect estimates for the outcome of TVT versus AFS operation time. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling.

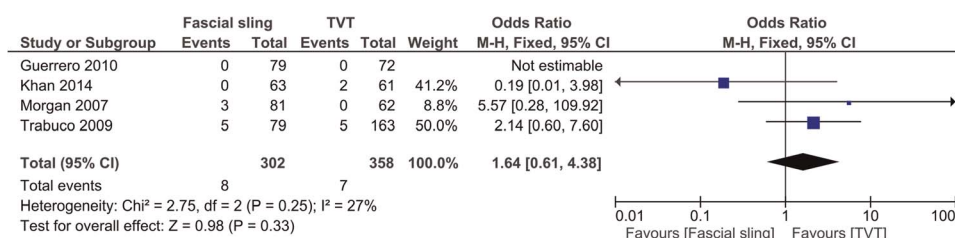


Figure 6. Forest plot pooled effect estimates for the outcome of TVT versus AFS reoperation. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling.

A total of 122 duplicate results were removed, and 7 studies published in languages other than English were also excluded. A total of 701 records were screened based on their titles and abstracts, and 670 records were excluded because of their publication type ($n = 530$), irrelevance ($n = 98$), or lack of comparisons between the interventions of interest ($n = 42$). The full texts of 31 records were sought for retrieval. However, 8 articles were not available. Screening of the available 23 records resulted in the exclusion of 4 studies (noncomparative studies). Thus, 19 studies were eligible for inclusion. Screening the reference lists of the retrieved articles led to the identification of 2 relevant studies, of which 1 article was eligible, whereas 1 was excluded (1 review article). Thus, 20 studies were finally included in this systematic review.^[11–30]

Of the 20 studies, 10 were RCTs. Comparisons included TVT versus AFS (11 studies, 6 RCTs), synthetic TOT versus autologous TOT (5 studies, 2 RCTs), and TOT versus A-PVS (4 studies, 2 RCTs) (Supplemental Digital Content 1 and 2 [http://links.lww.com/CURRUROL/A48, http://links.lww.com/CURRUROL/A49]).

3.1.1. Tension-free vaginal tape sling versus autologous rectus fascial sling

- (1) **Success** Nine studies including 1141 patients were assessed. The overall pooled effect estimates for surgical success showed that the TVT was significantly more successful than autologous rectus fascial sling (OR, M-H fixed [MHF] [95% CI], 0.66 [0.50–0.88]; I^2 , 0%, $p = 0.005$) (Fig. 2).
- (2) **Catheterization time** Three studies including 158 patients reported the results for catheterization time. Statistically significant overall pooled effect estimates showed the TVT group had shorter total catheter duration than the autologous rectus fascial sling group (standard mean difference [STD], IV random [IVR] [95% CI], 0.73 [0.10–1.36]; I^2 , 72%, $p = 0.02$) (Fig. 3).
- (3) **Hospital stay** Six studies reported hospital stay duration for 622 patients. The overall pooled effect estimates did not reveal a statistically significant difference in terms of hospital stay between the 2 groups (STD, IVR [95% CI], 0.22 [–0.04–0.49]; I^2 , 59%, $p = 0.10$) (Fig. 4).

- (4) **Operation time** Six studies reported operation time results for 474 patients. According to the pooled effect estimates, the TVT group was significantly more advantageous in terms of operation time than the autologous rectus fascial sling group (SMD, IVR [95% CI], 0.82 [0.29–1.35]; I^2 , 86%, $p = 0.002$) (Fig. 5).
- (5) **Reoperation** Reoperation was reported in 4 of 660 patients. According to pooled effect estimates, there was no statistically significant difference between the groups (OR, MHF [95% CI], 1.64 [0.61–4.38]; I^2 , 27%, $p = 0.33$) (Fig. 6).
- (6) **Satisfaction** Four studies (468 patients) reported the results for satisfaction. According to pooled effect estimates, there was no statistical difference observed between the 2 groups (OR, MHR [95% CI], 0.84 [0.37–1.92]; I^2 , 66%, $p = 0.68$) (Fig. 7).
- (7) **Maximum flow rate** Two studies evaluated a total of 114 patients. According to pooled effect estimates, no statistical difference was present between the 2 groups (SMD, IVR [95% CI], 0.05 [–0.32–0.42]; I^2 , 0%, $p = 0.78$) (Fig. 8).
- (8) **Questionnaires** Questionnaires used in the review included the validated Incontinence Impact Questionnaire—Short Form (6 studies; 896 patients), stress-related leak, emptying ability, anatomy, protection, inhibition (2 studies; 425 patients), Incontinence Symptom Index (ISI) (1 study; 124 patients), Short Form Survey questionnaire (1 study; 124 patients), EuroQol questionnaire scores (1 study; 124 patients), King's Health Questionnaire (KHQ) (1 study; 41 patients), postoperative pad diary (PPD) (1 study; 224 patients), Bristol female lower urinary tract symptom (1 study; 124 patients), Urinary Distress Inventory—Short Form (4 studies; 711 patients), and the nonvalidated visual analog scale (2 studies; 425 patients). According to the total overall pooled effect estimates, significant differences were not identified between the 2 groups (STD, IVR [95% CI], 0.06 [–0.11–0.23]; I^2 , 81%, $p = 0.48$). For the ISI total, KHQ, and PPD questionnaires, the overall effect estimates differed between the 2 groups (ISI total, $p < 0.01$; KHQ, $p = 0.02$; PPD, $p < 0.01$) (Fig. 9).
- (9) **Complications** To identify complications, 10 studies investigating 5830 patients were reviewed. Moreover, bladder injury, de novo urge incontinence, urethrolisis/release of the sling, infection

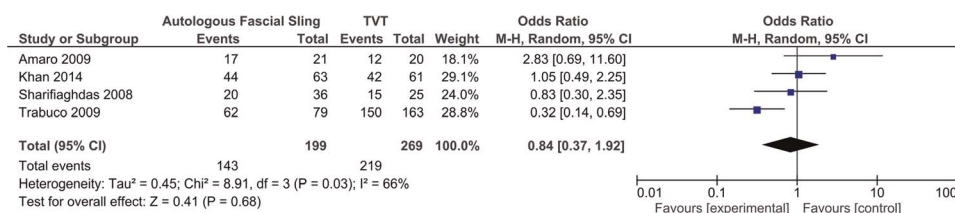


Figure 7. Forest plot pooled effect estimates for the outcome of TVT versus AFS satisfaction. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling.

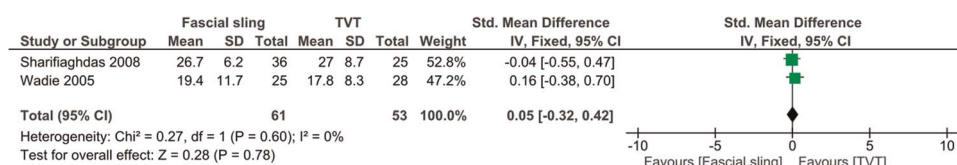


Figure 8. Forest plot pooled effect estimates for the outcome of TVT versus AFS Q_{max} . AFS = autologous fascial sling; CI = confidence interval; Q_{max} = maximum flow rate; TVT = tension-free vaginal tape sling.

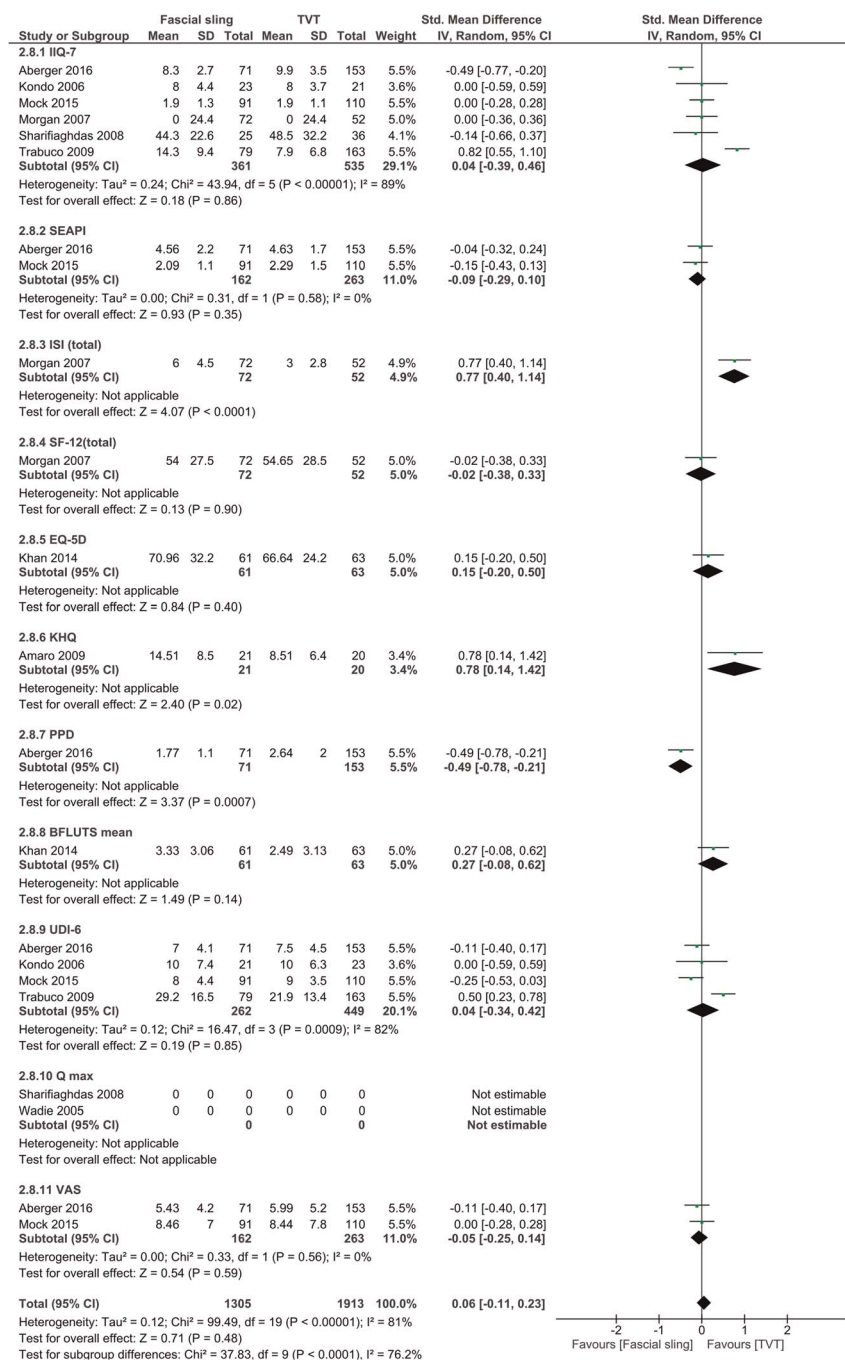


Figure 9. Forest plot pooled effect estimates for the outcome of TVT versus AFS questionnaires. AFS = autologous fascial sling; BFLUTS = Bristol female lower urinary tract symptoms; CI = confidence interval; EQ-5D = EuroQol questionnaire scores; IIQ-7 = Incontinence Impact Questionnaire—Short Form; ISI = incontinence symptom index; KHQ = King's Health Questionnaire; PPD = postoperative pad diary; Q_{max} = maximum flow rate; SEAPI = Stress related leak, emptying ability, anatomy, protection, inhibition, quality of life, mobility, and mental status; SF-12 = short form survey questionnaire; TVT = tension-free vaginal tape sling; UDI-6 = Urinary Distress Inventory—Short Form; VAS = visual analog scale.

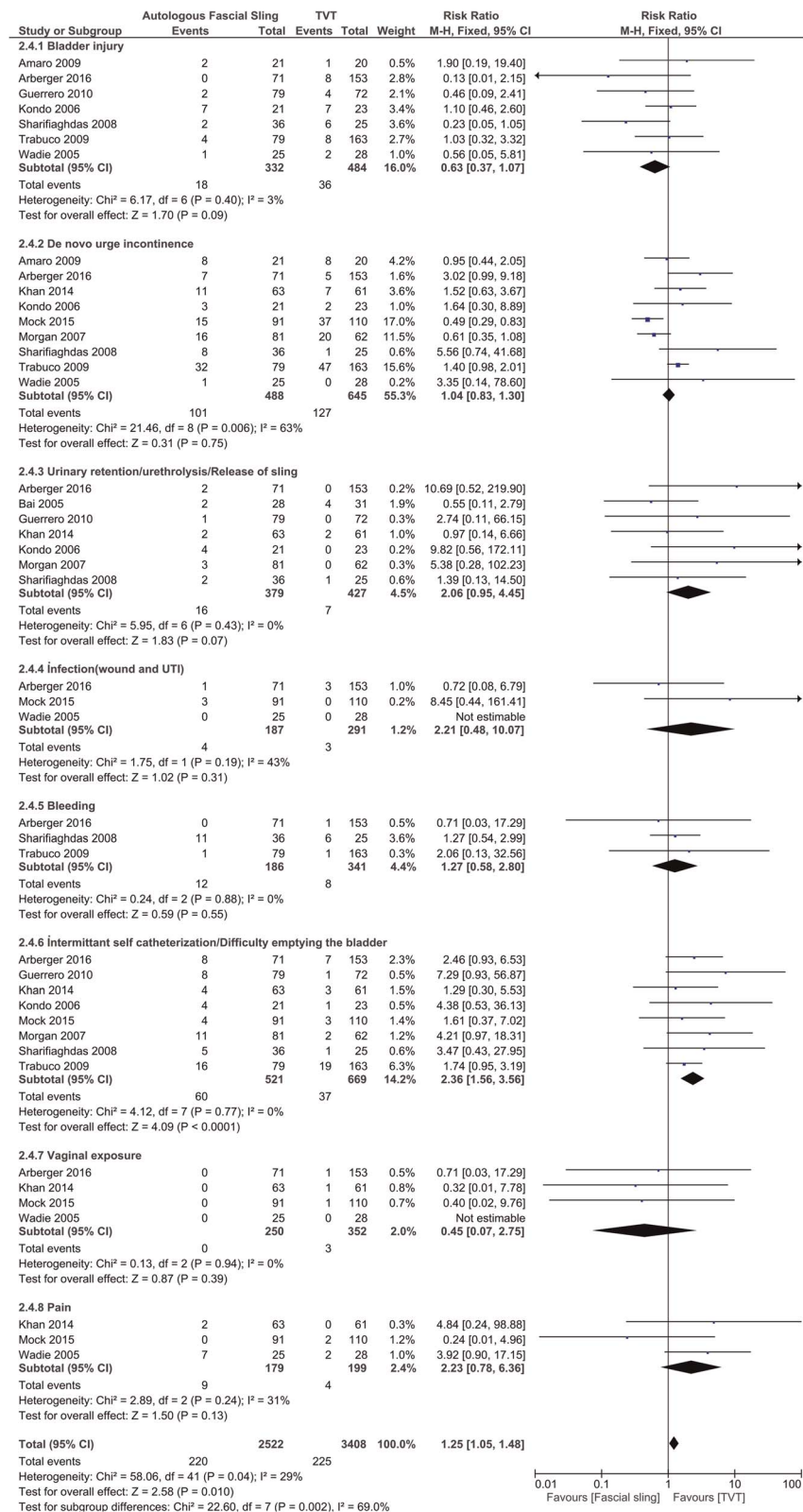


Figure 10. Forest plot pooled effect estimates for the outcome of TVT versus AFS complications. AFS = autologous fascial sling; CI = confidence interval; TVT = tension-free vaginal tape sling; UTI = urinary tract infection.

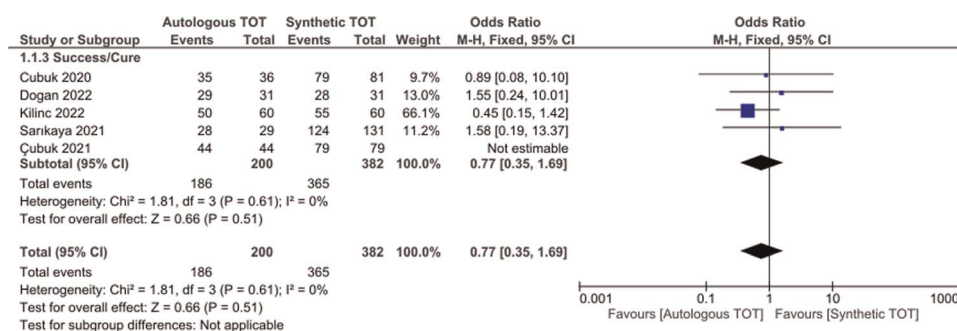


Figure 11. Forest plot pooled effect estimates for the outcome of TOT versus AFS success. AFS = autologous fascial sling; CI = confidence interval; TOT = transobturator tape.

(wound and urinary tract infection), bleeding, intermittent self-catheterization/difficulty emptying the bladder, vaginal exposure, and pain were investigated. According to the total pooled overall effect estimates, statistically significant differences were present (risk ratio [RR], MHF [95% CI], 1.26 [1.06–1.49]; I^2 , 32%, p = 0.01). Subdomain investigations found that the pooled effect estimates for urethrolisis/release of the sling were significantly more advantageous in the TVT group than in the autologous rectus fascial sling group (RR, MHF [95% CI], 3.17 [1.21–8.31]; I^2 , 0%, p = 0.02). Furthermore, the effect estimates for the intermittent self-catheterization/difficulty emptying bladder subdomain showed that the TVT group had a significant advantage over the autologous rectus fascial sling group (RR, MHF [95% CI], 2.36 [1.56–3.56]; I^2 , 0%, p < 0.01) (Fig. 10).

3.1.2. Transobturator tape versus autologous rectus fascial slings

- (1) **Success** Success was assessed in 5 of 582 patients. According to the overall effect estimates, no statistically significant differences were present between the 2 groups (OR, MHF [95% CI], 0.77 [0.35–1.69]; I^2 , 0%, p = 0.51) (Fig. 11).
- (2) **Operation time** The operation time was assessed in 5 studies of 584 patients. According to the overall pooled effect estimates, synthetic TOT was more advantageous than fascial TOT, with statistical significance (SMD, IVR [95% CI], 5.24 [3.66–6.82]; I^2 , 96%, p < 0.01) (Fig. 12).

- (3) **Hospitalization time** Total hospitalization time was assessed in 1 study including 162 patients. According to the effect estimates, the synthetic TOT group was more advantageous than the fascial TOT group in terms of hospital stay (SMD, IVR [95% CI], 5.05 [4.36–5.73]; p < 0.01) (Fig. 12).
- (4) **Postvoid residual** Postvoid residual was considered in 1 study involving 163 patients. According to the effect estimates, there were no significant differences between the 2 groups (STD, IVR [95% CI], 0.24 [–0.16–0.64]; p = 0.24) (Fig. 12).
- (5) **Complications** Complications were assessed in 5 studies involving 2202 patients. According to the overall pooled effect estimates, there were no statistically significant differences between the 2 groups for total complication rates (OR, MHF [95% CI], 0.79 [0.44–1.42]; I^2 , 0%, p = 0.43). When complications were considered separately in the subdomains (mesh erosion, urinary retention, hematoma, infection, pain/dyspareunia, and urethral/bladder injury), no statistically significant differences were identified between the surgical groups (Fig. 13).

Mesh erosion Mesh erosion was reported in 3 studies involving 299 patients. According to the overall effect estimates, no statistically significant differences were present between the 2 groups (OR, MHF [95% CI], 0.38 [0.04–3.55]; I^2 , 0%, p = 0.40).

Urinary retention Urinary retention was assessed in 3 studies involving 299 patients. According to the overall effect estimates,

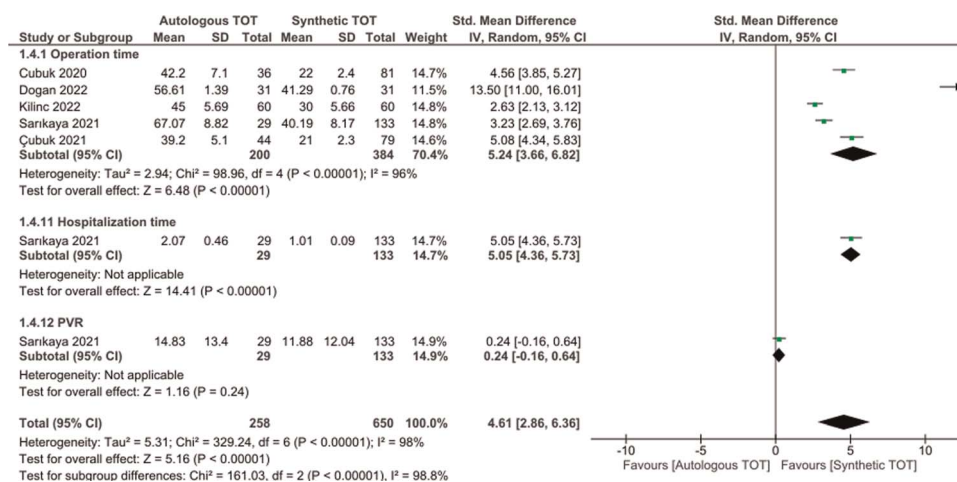


Figure 12. Forest plot pooled effect estimates for the outcome of TOT versus AFS operation time, hospitalization time, and PVR. AFS = autologous fascial sling; CI = confidence interval; PVR = postvoid residual; TOT = transobturator tape.

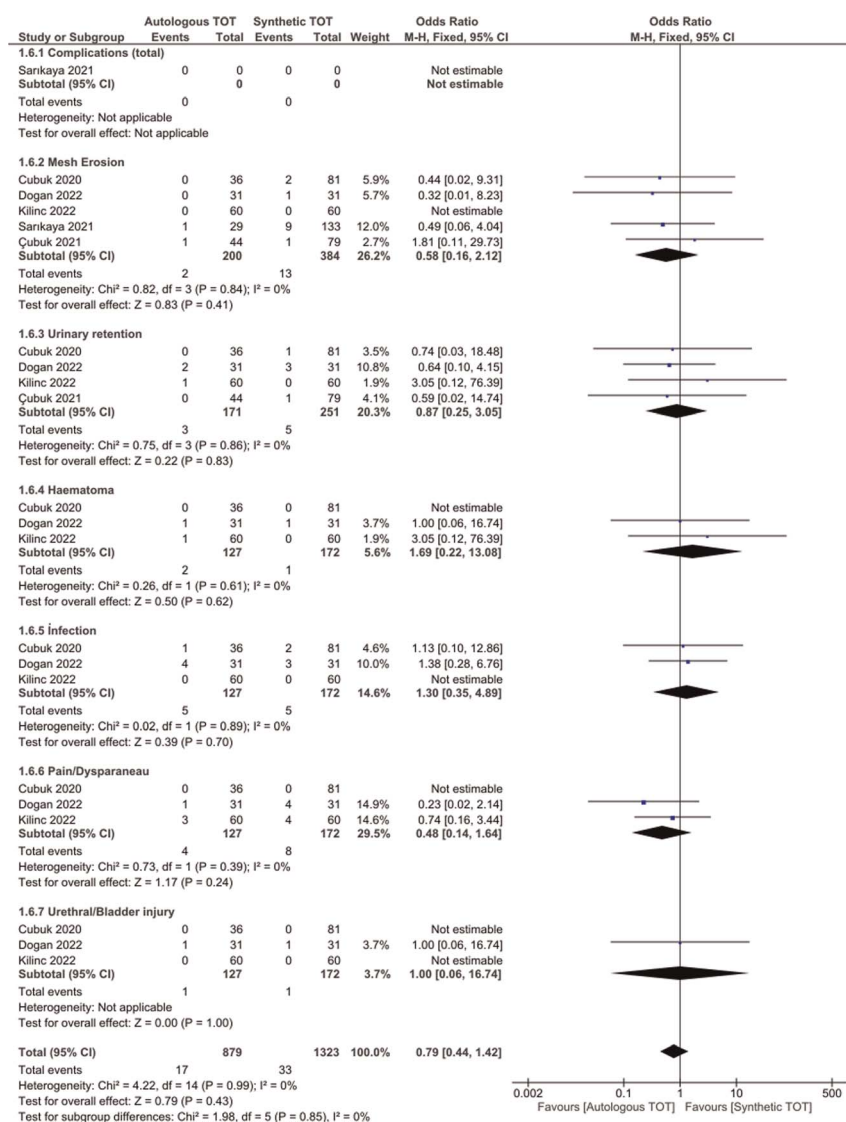


Figure 13. Forest plot pooled effect estimates for the outcome of TOT versus AFS complications. AFS = autologous fascial sling; CI = confidence interval; TOT = transobturator tape.

significant differences were not identified between the 2 groups (OR, MHF [95% CI], 0.94 [0.24–3.71]; I^2 , 0%, $p = 0.93$).

Hematoma Hematoma was considered in 3 studies including 299 patients. According to the overall effect estimates, significant differences were not present between the 2 groups (OR, MHF [95% CI], 1.69 [0.22–13.08]; I^2 , 0%, $p = 0.62$).

Infection Infection was considered in 3 studies involving 299 patients. According to the overall effect estimates, there were no significant differences between the 2 groups (OR, MHF [95% CI], 1.3 [0.35–4.89]; I^2 , 0%, $p = 0.70$).

Pain/dyspareunia Pain was addressed in 3 studies involving 299 patients. According to the overall effect estimates, significant differences were not identified between the 2 groups (OR, MHF [95% CI], 0.48 [0.14–1.64]; I^2 , 0%, $p = 0.24$).

Urethra/bladder injury Injury to the bladder was assessed in 3 studies including 299 patients. Only one of these studies reported a case of injury.^[14] As a result, the heterogeneity could

not be assessed. According to the effect estimates, no differences were observed between the 2 groups (OR, MHF [95% CI], 1 [0.06–16.74]; I^2 , could not be measured, $p = 1$).

- (6) **Questionnaires** Questionnaires were considered in 4 studies with 1195 patients. According to the overall pooled effect estimates, statistically significant differences were identified between the groups in terms of all questionnaires (SMD, IVR [95% CI], 0.15 [–0.22–0.52]; I^2 , 89%, $p = 0.43$) (Fig. 14).

Visual analog scale (Day 1) Visual analog scale was considered in 2 studies involving 237 patients. Effect estimates showed that the TVT group was more advantageous than the other group (STD, IVR [95% CI], 0.38 [0.11–0.65]; I^2 , 0%, $p < 0.01$).

Incontinence Impact Questionnaire—Short Form The Incontinence Impact Questionnaire—Short Form method was used in 1 study involving 62 patients. According to the effect estimates, no differences were present between the 2 groups (STD, IVR [95% CI], 0.38 [0.11–0.65]; $p = 0.42$).

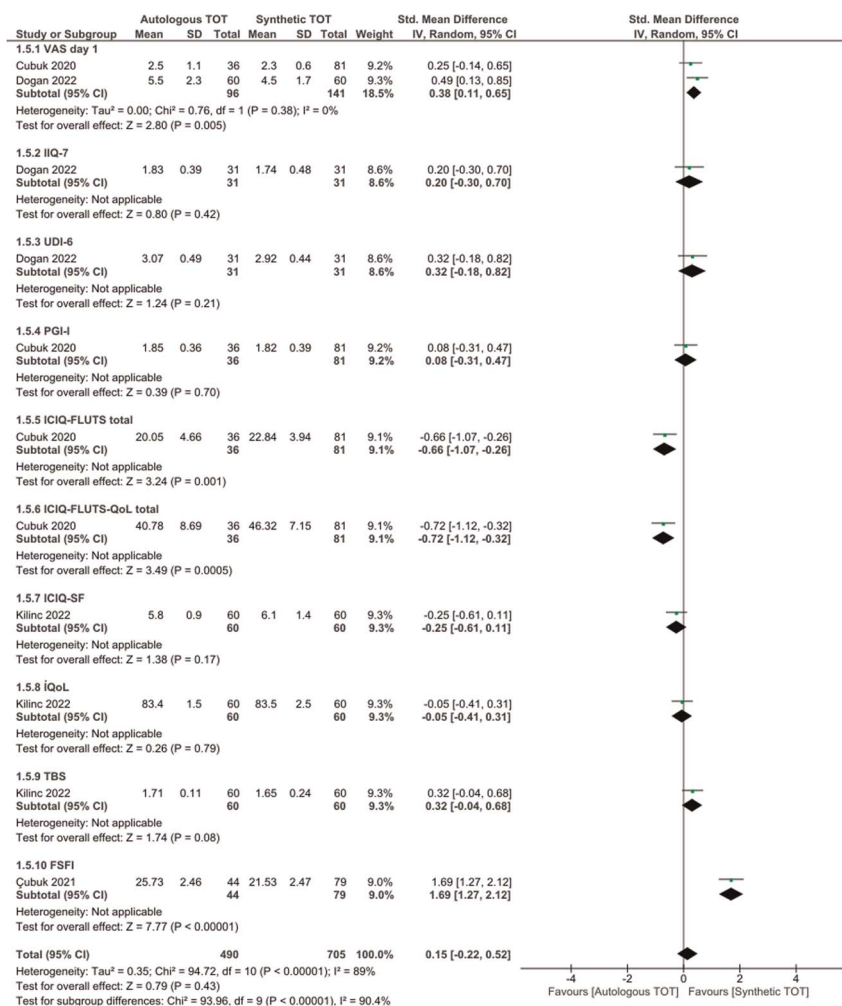


Figure 14. Forest plot pooled effect estimates for the outcome of TOT versus AFS questionnaires. AFS = autologous fascial sling; CI = confidence interval; FSFI = Female Sexual Function Index; IIQ-7 = Incontinence Impact Questionnaire—Short Form; ICIQ-FLUTS = International Consultation on Incontinence Modular Questionnaire—Female Lower Urinary Tract Symptoms; ICIQ-SF = International Consultation on Incontinence Modular Questionnaire—Short Form; iQoL = Urinary Incontinence Quality of Life Scale; PGI-1 = Patient Global Impression of Improvement; TBS = treatment benefit scale; QoL = quality of life scale; TOT = transobuturator tape; UDI = Urinary Distress Inventory—Short Form; VAS = visual analog scale.

Urinary Distress Inventory—Short Form The Urinary Distress Inventory—Short Form method was used in 1 study involving 62 patients. According to the effect estimates, no differences were present between the 2 groups (STD, IVR [95% CI], 0.20 [-0.3–0.7]; $p = 0.21$).

Patient Global Impression of Improvement Patient Global Impression of Improvement was assessed in 1 study involving 117 patients. According to the effect estimates, no statistical differences were found between the 2 groups (SMD, IVR [95% CI], 0.08 [-0.31–0.47]; $p = 0.70$).

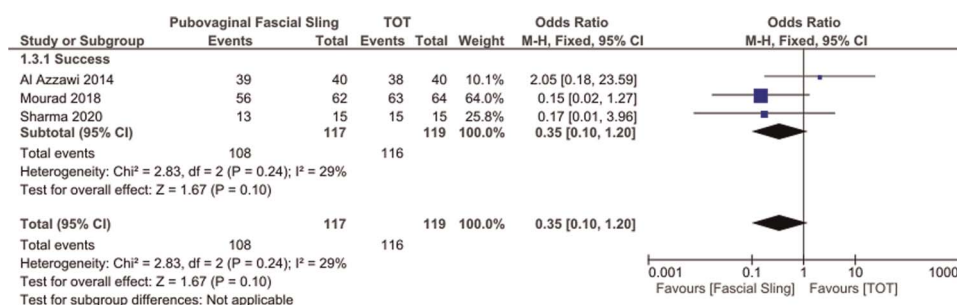


Figure 15. Forest plot pooled effect estimates for the outcome of TOT versus A-PVS success. A-PVS = autologous pubovaginal sling; CI = confidence interval; TOT = transobuturator tape.

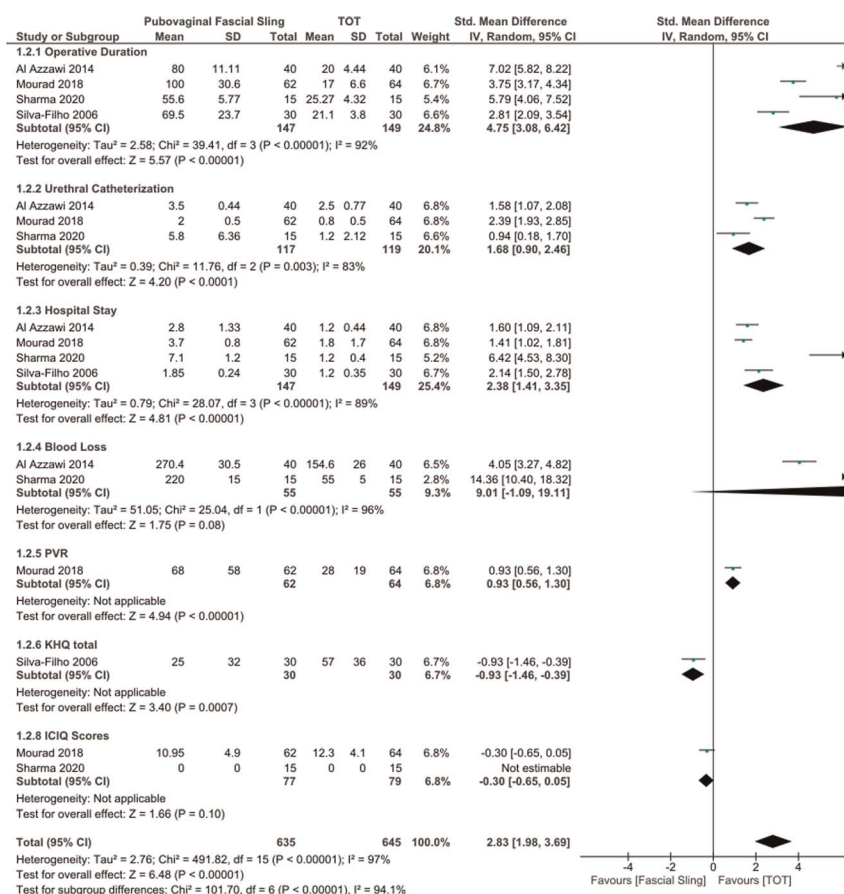


Figure 16. Forest plot pooled effect estimates for the outcome of TOT versus A-PVS dichotomous data. A-PVS = autologous pubovaginal sling; CI = confidence interval; ICIQ = Incontinence Modular Questionnaire; KHQ = King's Health Questionnaire; PVR = postvoid residual; TOT = transobturator tape.

International Consultation on Incontinence Modular Questionnaire—Female Lower Urinary Tract Symptoms total The International Consultation on Incontinence Modular Questionnaire (ICIQ)—Female Lower Urinary Tract Symptoms was used in 1 study of 117 patients. According to the effect estimates, statistically significant differences were present (SMD, IVR [95% CI], 0.66 [−1.07 to −0.26]; $p < 0.01$).

International Consultation on Incontinence Modular Questionnaire—Female Lower Urinary Tract Symptoms—Quality of Life total The ICIQ—Female Lower Urinary Tract Symptoms—Quality of Life was assessed in 1 study involving 117 patients. According to the effect estimates, significant differences were observed between the groups (SMD, IVR [95% CI], −0.72 [−1.12 to −0.32]; $p < 0.01$).

International Consultation on Incontinence Modular Questionnaire—Short Form The ICIQ—Short Form was considered in 1 study involving 120 patients. According to the effect estimates, no significant differences were observed between the 2 groups (SMD, IVR [95% CI], −0.25 [−0.61–0.11]; $p = 0.11$).

Urinary Incontinence Quality of Life Scale The Urinary Incontinence Quality of Life Scale was used in 1 study that included 120 patients. According to the effect estimates, no significant differences were present between the 2 groups (SMD, IVR [95% CI], −0.05 [−0.41–0.31]; $p = 0.79$).

Treatment Benefit Scale Treatment benefit scale was used in 1 study that included 120 patients. According to the effect estimates, no significant differences were present between the 2 groups (SMD, IVR [95% CI], 0.31 [−0.04–0.68]; $p = 0.08$).

Female Sexual Function Index Female Sexual Function Index was assessed in 1 study of 123 patients. According to the effect estimates, statistically significant differences were identified between the groups (SMD, IVR [95% CI], 0.15 [−0.22–0.52]; $p < 0.01$).

3.1.3. Transobturator tape versus autologous pubovaginal sling

(1) **Success** Success was considered in 3 studies, including 236 patients. According to the effect estimates, no difference was identified between the 2 groups (OR, MHR [95% CI], 0.35 [0.10–1.20]; I^2 , 29%, $p = 0.10$) (Fig. 15).

(2) **Dichotomous data**

Operation time Operation time was considered in 3 studies of 236 patients. According to the effect estimates, the TOT group had a statistical advantage over the A-PVS group (SMD, IVR [95% CI], 5.47 [3.18–7.76]; I^2 , 92%, $p < 0.01$) (Fig. 16).

Urethral catheterization Catheterization was evaluated in 3 studies involving 236 patients. According to the effect estimates, the catheter duration was shorter by a statistically significant amount in the synthetic TOT group than that in the A-PVS group (SMD, IVR [95% CI], 1.68 [0.9–2.46]; I^2 , 83%, $p < 0.01$).

Hospital stay Duration of hospital stay was assessed in 3 studies involving 236 patients. According to the effect estimates, the synthetic TOT group had significantly shorter hospital stays than the

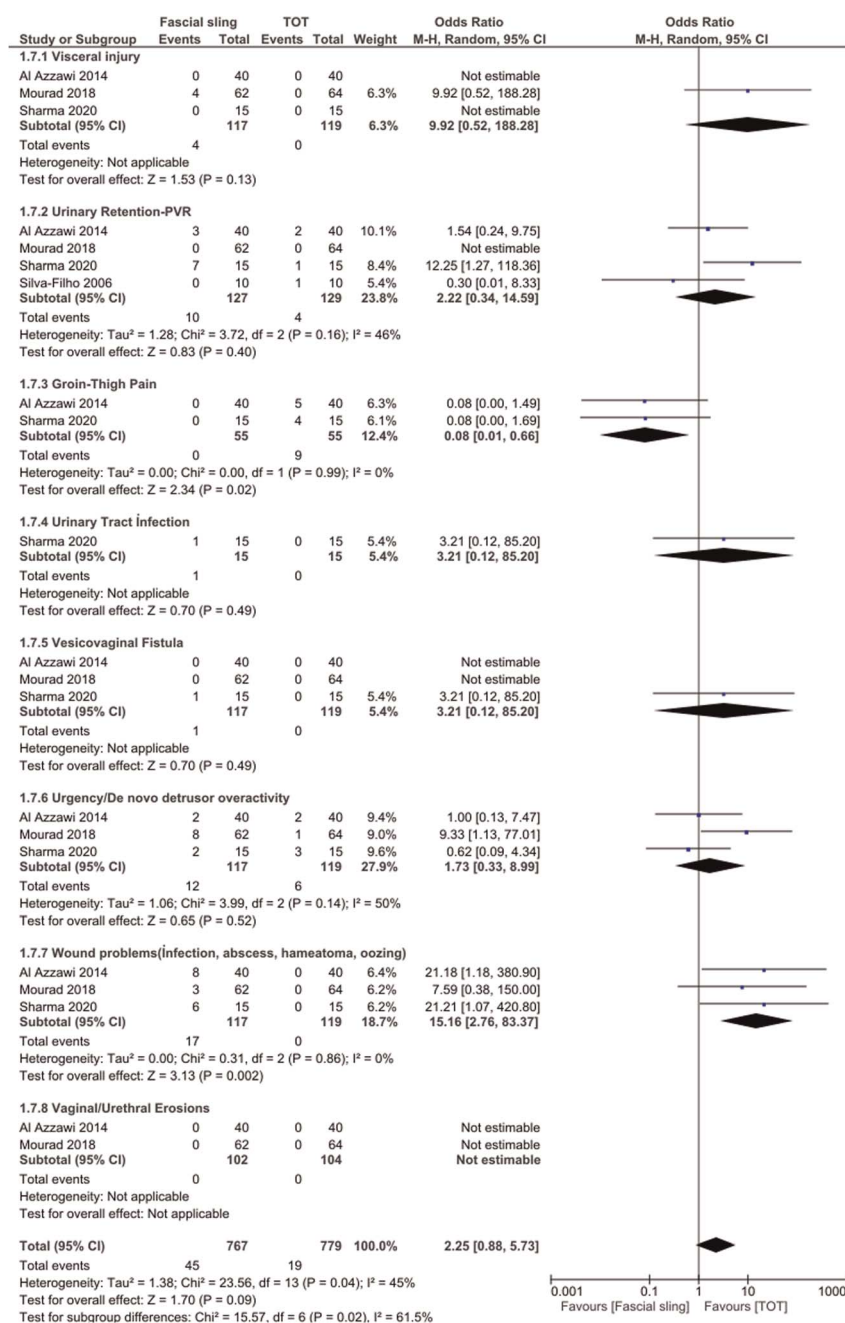


Figure 17. Forest plot pooled effect estimates for the outcome of TOT versus A-PVS complications. A-PVS = autologous pubovaginal sling; CI = confidence interval; PVR = postvoid residual; TOT = transobturator tape.

A-PVS group (SMD, IVR [95% CI], 2.62 [1.27–3.97]; I^2 , 92%, $p < 0.01$).

Blood loss Blood loss was assessed in 2 studies with 110 patients. According to the effect estimates, no statistically significant differences were identified between the 2 groups (SMD, IVR [95% CI], 9.01 [–1.09–19.11]; I^2 , 96%, $p = 0.08$).

Postvoid residual Postvoid residual was considered in 1 study including 126 patients. According to the effect estimates, the TOT group appeared more advantageous than the A-PVS group in terms of postvoid residual (SMD, IVR [95% CI], 0.93 [0.56–1.3]; $p < 0.01$).

International Consultation on Incontinence Modular Questionnaire scores The ICIQ scores were assessed in 2 studies involving 156 patients. According to the effect estimates, no statistically significant difference was observed between the 2 groups (SMD, IVR [95% CI], –0.33 [–0.68–0.02]; $p = 0.07$).

(3) **Complications** Complications were assessed in 4 studies involving 1546 patients. According to the overall pooled effect estimates, no statistically significant differences were observed between the 2 groups (OR, MHR [95% CI], 2.25 [0.88–5.73]; I^2 , 45%, $p = 0.09$) (Fig. 17).

Visceral injury The visceral injury was assessed in 3 studies with 236 patients. According to the effect estimates, there were no

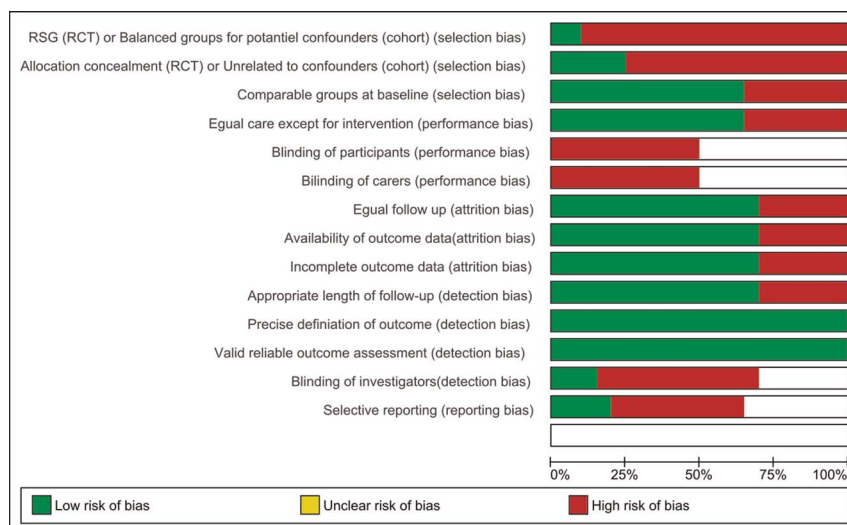


Figure 18. Risk-of-bias graph. RSG = random sequence generation; RCT = randomized controlled trial.

significant differences between the 2 groups (OR, MHR [95% CI], 9.92 [0.52–188.28]; $p = 0.13$).

Urinary retention–postvoid residual Urinary retention was assessed in 4 studies involving 256 patients. According to the effect estimates, no significant differences were found between the 2 groups (OR, MHR [95% CI], 2.22 [0.34–14.59]; I^2 , 46%, $p = 0.40$).

Groin-thigh pain Pain was assessed in 2 studies involving 110 patients. Effect estimates revealed that the TOT group reported significantly more complaints about the pain as compared with the other group (OR, MHR [95% CI], 0.08 [0.01–0.66]; I^2 , 0%, $p = 0.02$).

Urinary tract infections Urinary tract infection was investigated in 1 study of 30 patients. According to the effect estimates, no significant differences were found between the 2 groups (OR, MHR [95% CI], 3.21 [0.12–85.2]; $p = 0.49$).

Vesicovaginal fistula The development of a fistula was evaluated in 3 studies including 236 patients. According to the effect estimates, there were no significant differences between the 2 groups (OR, MHR [95% CI], 3.21 [0.12–85.2]; $p = 0.49$).

Urgency/de novo detrusor overactivity The detrusor overactivity was assessed in 3 studies involving 236 patients. According to the overall effect estimates, no statistically significant differences were identified between the 2 groups (OR, MHR [95% CI], 1.73 [0.33–8.99]; I^2 , 50%, $p = 0.52$).

Wound problems (infection, abscess, hematoma, oozing) Problems associated with wound healing were evaluated in 3 studies with 236 patients. According to the effect estimates, statistically significant differences in favor of the A-PVS were identified (OR, MHR [95% CI], 15.16 [2.76–83.37]; I^2 , 0%, $p < 0.01$).

Vaginal/urethral erosion Vaginal erosion was considered in 2 studies involving 206 patients. None of the patients experienced complications.

3.2. Assessment of the risk of bias in the included studies

The risk of bias was assessed using the National Institute for Health and Care Excellence checklist for cohort studies and RCTs, which comprises 4 main domains: selection, performance, attrition, and detection biases.

According to selection bias, 2 studies in the AFS versus TVT group^[21,22] had a low bias risk according to random sequencing generation, whereas for allocation concealment, 5 studies were assessed as low risk because of good definition.^[20–23,25] For the autologous TOT versus synthetic TOT and AFS versus synthetic TOT groups, no RCTs defined the random sequencing generation and allocation concealment processes; therefore, they were assessed as having a high bias risk. In retrospective studies, the potential confounders affecting the choice of intervention were uncertain or even high (particularly in studies with significant differences in baseline characteristics between the 2 groups).

None of the studies reported blinding of patients or caregivers, blinding of investigators, or uncertain risk. We assessed the reporting of surgical follow-up duration and complications between the groups as having a low risk of attrition bias (Figs. 18 and 19).

Apart from the suspected blinding of investigators, all studies had adequate durations of postoperative follow-up and were assessed as low-risk in terms of defining surgical success and assessment methods.

4. Discussion

Histological studies performed with AFS showed good neovascularization and remodeling along the sling line due to fibroblastic proliferation, resulting in the preservation of sling vitality.^[31] In later years, autologous grafts may remain vital with a linear organization without degeneration.^[32] Polypropylene meshes ensure anchorage of the grafted tissue by developing good tissue integration.^[33] Animal studies and biopsies have reported uniform tissue reactions with well-organized collagen lines,^[34] without any degradation and encapsulation.^[35] As a result, both graft materials have been reported to sustain the necessary tensile capability consistent with that of the suburethral tissue for many years.

Moreover, A-PVS is used to provide the necessary support to the bladder neck and proximal urethra to ensure adequate urethral closure when intra-abdominal pressure increases. They provide adequate support to ensure continence even with the severe intrinsic sphincter deficiency observed with a fixed open urethra. Therefore, PVS is the most successful long-term treatment

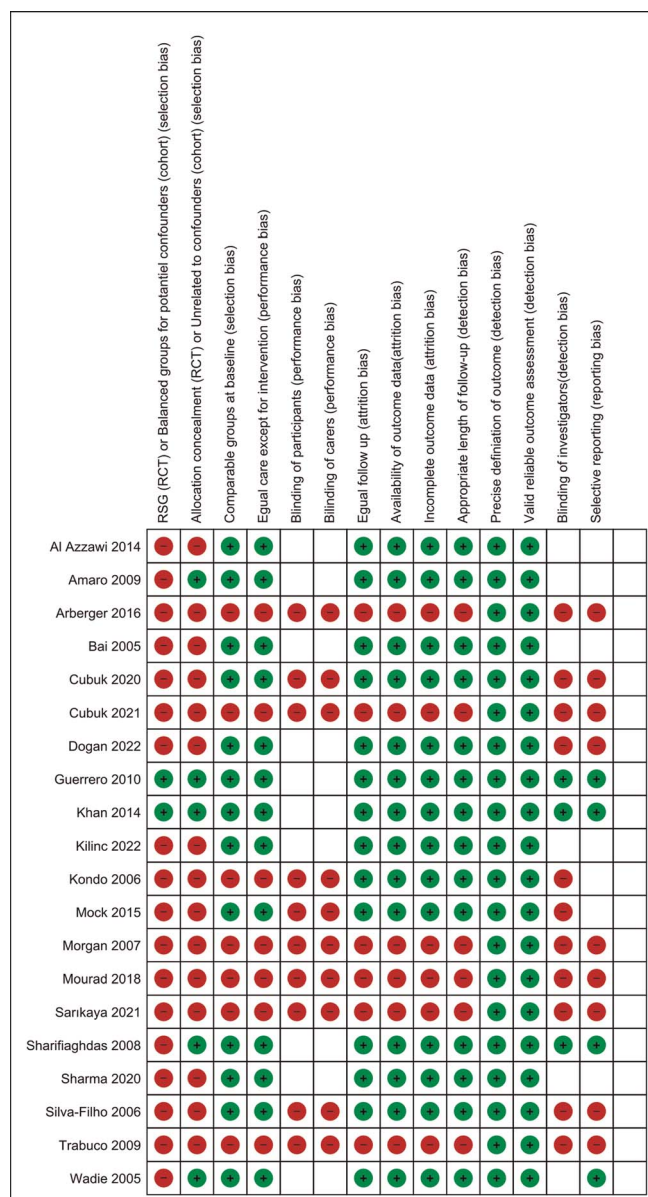


Figure 19. Risk-of-bias summary. RSG = random sequence generation; RCT = randomized controlled trial.

method for SUI treatment. However, slightly higher complication rates, longer recovery times, and postoperative voiding dysfunction may occur.

In the mid-1990s, it was understood that the central urethra, rather than the bladder neck, was the key mechanism in urinary continence, and therefore, TVT was developed.^[36] Although originally developed for the treatment of SUI with urethral hypermobility, it has also been reported to be effective in some patients with intrinsic sphincter deficiency.^[37] When the TVT supports the midurethral area without tension, it has been reported to be effective even in patients with very low urethral closure pressure. Long-term follow-up studies have found that patient satisfaction, cure, and improvement rates for TVT^[38] and AFS^[39] are satisfactory.

In this meta-analysis, TVT was found to be more successful in the medium- and long-term follow-up, with similar patient satisfaction rates. Moreover, TVT appeared to be statistically superior

in terms of operation time, catheterization time, urethrolisis, and intermittent self-catheterization. However, similar hospitalization lengths and lack of variation in the frequency of reoperations are circumstances that should not be ignored. These factors show that AFS plays a role in stress incontinence treatment and is an important sling source. Factors assessed postoperatively affect surgical success, along with cure criteria, surgeon experience, and heterogeneous characteristics of patients.

Complications such as bladder rupture when entering the abdominal cavity and urinary dysfunction may occur; therefore, a more minimally invasive method of TOT was defined instead of transvaginal surgeries requiring definite cystoscopy checks. Transobturator tape allows the normal anatomy of the suburethral area to be used as support. Since the beginning of the 2000s, suburethral tension-free synthetic TOT surgeries have been used successfully, with their high success and minor complication rates making them quite popular. However, because of complications observed related to the synthetic mesh, such as infections, vaginal and urethral erosion, and vaginal mesh extrusion, opposition to the use of vaginal meshes has begun. The idea of returning to autologous tape and sling sources has become increasingly popular, owing to both the cost of the mesh and negative opinions regarding synthetic vaginal meshes. The fascial graft used for autologous fascial TOT is shorter than the pubovaginal axis. Therefore, AFS using the transobturator path has come to the forefront.

This meta-analysis showed that synthetic TOT was superior to autologous TOT in terms of operative and hospitalization times. However, no differences were identified between the groups in terms of surgical success, patient satisfaction, questionnaires indicating subjective surgical success, or total complication rates. The need for an extra incision to obtain an AFS is the greatest disadvantage of autologous fascial tape, whereas factors emerging among the advantages include the lack of tissue reaction and lack of sexual complaints such as dyspareunia, especially among young and sexually active women. In the comparison of AFS with synthetic TOT surgeries, as in the comparison of autologous-TOT and synthetic-TOT, surgical success and postoperative questionnaire outcomes were similar. Although there was a difference in the total complications, there were more problems related to the wound site, such as infection, abscess, hematoma, and oozing, in the AFS group, whereas groin/thigh pain was significantly greater in the TOT group.

This study was limited by factors such as surgeons with different surgical backgrounds, diversity of patients operated on, variations in the objective and subjective assessment criteria for surgical success, differences in follow-up durations, and a higher risk of bias due to the inclusion of retrospective studies in this meta-analysis.

5. Conclusions

The medium- and long-term complication rates and urinary incontinence outcomes of autologous rectus fascia grafts using A-PVS or TOT were similar to those of midurethral synthetic mesh (TVT, TOT). Although the need for an extra incision appears to be a handicap, it is a good alternative for countries where obtaining a mesh is difficult due to financial costs and complications related to the mesh.

Acknowledgments

None

Statement of ethics

This systematic review and meta-analysis followed the principles of the Cochrane Handbook for Systematic Reviews of Interventions, version 6, and the results were reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Conflict of interest statement

No conflict of interest has been declared by the author.

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Author contributions

YG: Data collection, statistical analysis and writing of the article.

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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