

UROGYNECOLOGY

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

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OBJECTIVE: Understanding the long-term comparative effectiveness of competing surgical repairs is essential as failures after primary interventions for stress urinary incontinence (SUI) may result in a third of women requiring repeat surgery.

STUDY DESIGN: We conducted a systematic review including English-language randomized controlled trials from 1990 through April 2013 with a minimum 12 months of follow-up comparing a sling procedure for SUI to another sling or Burch urethropexy. When at least 3 randomized controlled trials compared the same surgeries for the same outcome, we performed random effects model metaanalyses to estimate pooled odds ratios (ORs).

RESULTS: For midurethral slings (MUS) vs Burch, metaanalysis of objective cure showed no significant difference (OR, 1.18; 95% confidence interval [CI], 0.73–1.89). Therefore, we suggest either intervention; the decision should balance potential adverse events (AEs) and concomitant surgeries. For women considering pubovaginal sling vs Burch, the evidence favored slings for both subjective and objective cure. We recommend pubovaginal sling to maximize cure outcomes. For pubovaginal slings vs MUS, metaanalysis of subjective cure favored MUS (OR, 0.40; 95% CI,

0.18–0.85). Therefore, we recommend MUS. For obturator slings vs retropubic MUS, metaanalyses for both objective (OR, 1.16; 95% CI, 0.93–1.45) and subjective cure (OR, 1.17; 95% CI, 0.91–1.51) favored retropubic slings but were not significant. Metaanalysis of satisfaction outcomes favored obturator slings but was not significant (OR, 0.77; 95% CI, 0.52–1.13). AEs were variable between slings; metaanalysis showed overactive bladder symptoms were more common following retropubic slings (OR, 1.413; 95% CI, 1.01–1.98, $P = .046$). We recommend either retropubic or obturator slings for cure outcomes; the decision should balance AEs. For minislings vs full-length MUS, metaanalyses of objective (OR, 4.16; 95% CI, 2.15–8.05) and subjective (OR, 2.65; 95% CI, 1.36–5.17) cure both significantly favored full-length slings. Therefore, we recommend a full-length MUS.

CONCLUSION: Surgical procedures for SUI differ for success rates and complications, and both should be incorporated into surgical decision-making. Low- to high-quality evidence permitted mostly level-1 recommendations when guidelines were possible.

Key words: Burch urethropexy, midurethral sling, pubovaginal sling, stress urinary incontinence, single-incision sling

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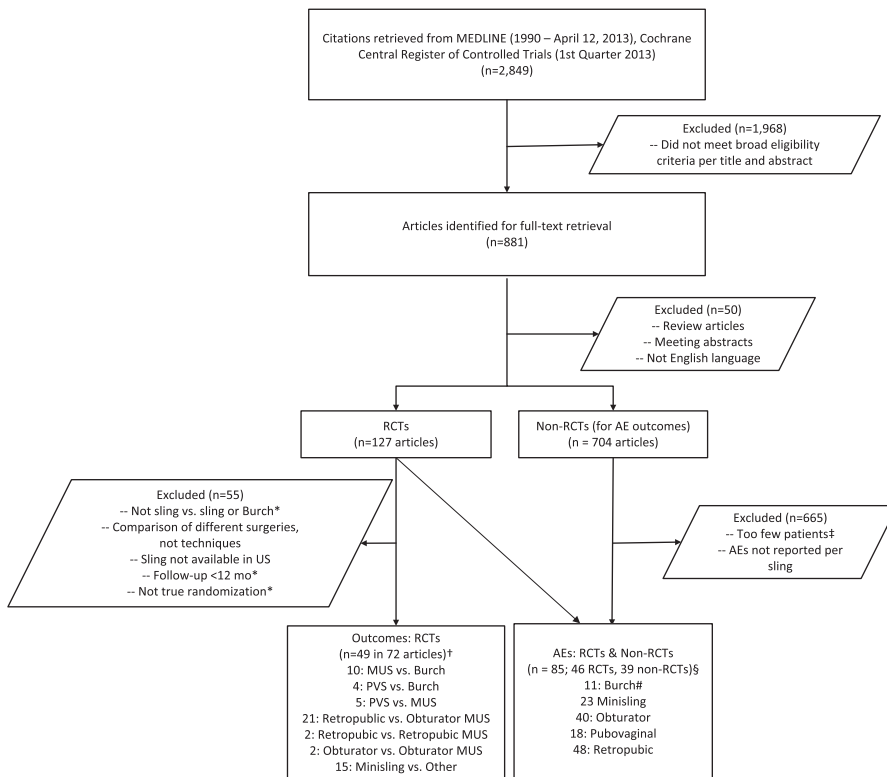
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FIGURE 1
Literature flow



PVS, pubovaginal slings.

*These studies were potentially eligible to be included for adverse event (AE) analyses; †Several studies had 3 arms and provided data for multiple comparisons; ‡For noncomparative studies, the following minimum sample size criteria were used: minisling obturator, $n \geq 120$; minisling retropubic, $n \geq 100$; obturator midurethral sling (MUS), $n \geq 1000$; pubovaginal fascial, $n \geq 300$; pubovaginal synthetic, $n \geq 120$; retropubic MUS, $n \geq 1000$; §Several studies reported on ≥ 2 slings; #Only from randomized controlled trials (RCTs).

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Stress urinary incontinence (SUI), or the involuntary loss of urine with activity such as coughing, laughing, and sneezing, is present in 15-80% of women.¹ Options for treating SUI include physical therapy, pessaries, urethral bulking injections, and surgery. Surgery traditionally consisted of Burch urethropexy or pubovaginal sling. Since 1996, when Ulmsten et al² 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.³ This type of surgery has evolved to also include options of obturator passage and smaller, single-incision synthetic slings (eg, “minislings”).

The decision of which SUI procedure to perform can include suture-only, native

tissue, mesh, laparoscopic, open incisions, small incisions, or single-incision surgery. Many studies have compared these options. The primary aim of our work was to utilize systematic review and meta-analysis methodology to compare objective and subjective cure rates in adult women with SUI between these different surgeries. The secondary outcomes were to compare surgical methods by quality-of-life measures, sexual function, and perioperative and adverse event (AE) data.

MATERIALS AND METHODS

The Society of Gynecologic Surgeons Systematic Review Group includes members with clinical and surgical expertise on female SUI and in the conduct of systematic reviews and guideline development. This project was considered exempt from institutional review board approval.

Data sources and searches

We searched MEDLINE and Cochrane Central Register for Controlled Trials from Jan. 1, 1990 through April 12, 2013 (Figure 1). We excluded older studies because the TVT was not available in the United States prior to this. Search terms included “urinary incontinence,” “urgency,” “sling,” “obturator,” “retropubic,” “pubovaginal,” “vaginal tape,” “urologic surgical procedures” (instrumentation or adverse effects), and related terms. The search was limited to comparative studies, cohort studies, and systematic reviews. The search was further limited to human and English-language studies. Meeting abstracts were excluded. Any review articles obtained in this search were excluded after reference lists were reviewed and articles not originally in the search were obtained. Study authors were not contacted.

Twelve reviewers independently double-screened the abstracts using the computerized screening program Abstrackr (Tufts Medical Center, Boston, MA).⁴ To establish relevance and consensus among reviewers, all 12 screened and achieved consensus on an initial batch of 300 abstracts. Potentially relevant full-text articles were also independently double-screened by 12 reviewers.

Study selection

For the principal evaluation of outcomes, we included peer-reviewed randomized controlled trials (RCTs) with at least 12 months of follow-up (Table 1). Trials were excluded from outcomes analysis for poor randomization schemes, such as alternate assignment of patients or assignment based on day of the week or birth date. We included RCTs that compared ≥ 2 sling procedures or a sling procedure to Burch urethropexy performed in adult women for SUI. Studies that compared Burch urethropexy to any other surgery were excluded. Bulking injections were excluded because they are not similar enough to sling surgeries regarding cure, perioperative data, or AEs. When a study included 3 arms, it was analyzed as multiple 2-arm comparisons. For the evaluation of AEs we

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