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SURGICAL MANAGEMENT OF STRESS URINARY INCONTINENCE: A REVIEW OF LONG-TERM (≥5 YEARS) OUTCOMES COMPARING TENSION-FREE VAGINAL TAPE (TVT) AND TRANSOBTURATOR TAPE (TOT)

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ABSTRACT

Background: Stress urinary incontinence (SUI) is a common condition where mid-urethral slings (MUS) are the standard surgical treatment. While the retropubic tension-free vaginal tape (TVT) and transobturator tape (TOT) have proven short-term efficacy, a synthesis of their long-term (≥5 years) comparative performance is needed to guide clinical practice.
Aim: This narrative review aims to synthesize and critically evaluate evidence from studies with a follow-up of five years or longer, comparing the long-term efficacy and safety of TVT versus TOT for the surgical management of female SUI.
Results: Long-term data indicate high and durable subjective satisfaction for both procedures. However, a consistent trend favors the TVT in objective efficacy, evidenced by a significantly lower reoperation rate for recurrent SUI, particularly in high-risk populations such as women with intrinsic sphincter deficiency (ISD). The established short-term complication profiles—a higher risk of bladder injury and voiding dysfunction for TVT versus a higher risk of groin pain for TOT—persist long-term. Very long-term evidence confirms that mesh exposure, while infrequent, is a lifelong risk.
Conclusion: The choice between TVT and TOT is a nuanced clinical decision involving a trade-off between the superior long-term durability of TVT and the enhanced initial safety of TOT. For patients with a high risk of recurrence, particularly those with ISD, the TVT appears to be the evidence-based procedure of choice. For all other patients, the decision must be individualized through a comprehensive shared decision-making process.

KEYWORDS

Stress Urinary Incontinence, Mid-Urethral Sling, Tension-Free Vaginal Tape (TVT), Transobturator Tape (TOT), Long-Term Outcomes, Surgical Complications

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1. Introduction

Stress urinary incontinence (SUI), formally defined by the International Continence Society (ICS) as the complaint of involuntary leakage of urine during physical exertion, sneezing, or coughing, represents one of the most common urological disorders affecting women worldwide (Reisenauer et al., 2013; Aoki et al., 2017). Epidemiological studies indicate a prevalence ranging from 10% to over 40%, with a peak incidence observed in women between the ages of 45 and 59 (Aoki et al., 2017; Petca et al., 2025; Chow et al., 2022). The impact of SUI is profound, extending well beyond its physical manifestation. It significantly impairs health-related quality of life (QoL), acting as an independent risk factor for anxiety and depression, and is associated with considerable work limitations, social isolation, and sexual dysfunction (Chow et al., 2022; AlQuaiz et al., 2023). Despite the substantial personal and societal burden, SUI remains an under-reported and under-treated condition, often due to social stigma or a pervasive, albeit incorrect, belief that it is an inevitable consequence of aging and childbirth (Bhadana et al., 2017; Aoki et al., 2017).

The pathophysiology of SUI is complex and multifactorial, but contemporary understanding centers on two primary, often coexisting, mechanisms: urethral hypermobility and intrinsic sphincter deficiency (ISD) (Falah-Hassani et al., 2021; Aoki et al., 2017). Urethral hypermobility stems from the failure of pelvic floor supportive structures—explained by the "hammock hypothesis"—to provide a stable backboard for urethral compression during increases in abdominal pressure. ISD describes a primary failure of the urethral sphincter's neuromuscular components to maintain coaptation and adequate closure pressure (Falah-Hassani et al., 2021; Wu et al., 2024). These two mechanisms, often coexisting, form the theoretical basis for modern surgical interventions aimed at restoring urethral support and function.

The clinical management pathway for SUI begins with conservative strategies, including supervised pelvic floor muscle training (PFMT), which remains the cornerstone of non-surgical care (Petca et al., 2025; Reisenauer et al., 2013). However, when these measures fail to provide adequate relief, surgical intervention becomes the definitive treatment modality. The surgical landscape itself has undergone a revolutionary transformation. For many years, open abdominal procedures such as the Burch colposuspension were the gold standard, but their invasiveness, significant morbidity, and long recovery periods spurred the search for better alternatives (Chen et al., 2024; Lee, Lee, & Lee, 2010).

This search culminated in the mid-1990s with the introduction of the minimally invasive mid-urethral sling (MUS), a concept derived from the "integral theory" of continence (Lee, Lee, & Lee, 2010). The first-generation MUS, the retropubic tension-free vaginal tape (TVT), offered efficacy comparable to the Burch procedure but with drastically reduced morbidity (Salo et al., 2023). Nevertheless, the "blind" passage of needles through the retropubic space carried a small but undeniable risk of severe complications, including bladder, bowel, and vascular injury (Bhadana et al., 2017; Chen et al., 2024). This led to the development of the transobturator tape (TOT) in 2001, which pioneered a new surgical route through the obturator foramen to completely avoid the retropubic space (Lee, Lee, & Lee, 2010; Chen et al., 2024).

The subsequent proliferation of short- and medium-term studies established a clear clinical dichotomy: TVT and TOT demonstrated comparable high efficacy, but with distinct and predictable complication profiles. The TVT route was associated with higher rates of bladder perforation and voiding dysfunction, while the TOT route was linked to a higher incidence of transient groin pain (Huang et al., 2018; Bhadana et al., 2017). An important nuance also emerged, suggesting that the more obstructive nature of the retropubic TVT might offer superior results in the challenging subpopulation of patients with ISD (Kim et al., 2016; Schierlitz et al., 2012).

While this short-term trade-off became well-established, a critical question remained unanswered: what are the consequences of these choices over the long term? Given that these are permanent implants placed in women who may live for many decades post-surgery, understanding long-term durability and the potential for late-onset complications is of paramount importance (Guillot-Tantay et al., 2023). Early long-term follow-up studies, such as the 5-year analysis of the TOMUS trial, began to reveal that objective success rates decline over time and that short-term equivalence does not necessarily predict long-term performance (Kenton et al.,

2015). The recent emergence of data from studies with follow-up periods extending to 16 and 17 years now provides an unprecedented opportunity to address this knowledge gap (Salo et al., 2023; Braga et al., 2024).

This review, therefore, undertakes a critical synthesis of the most mature evidence available, focusing exclusively on comparative studies with a follow-up of five years or more. By systematically analyzing the long-term trajectories of efficacy, safety, patient-reported outcomes, and reoperation rates for both retropubic TVT and transobturator TOT, this paper aims to construct an evidence-based framework to guide contemporary surgical practice and inform the crucial dialogue between surgeon and patient.

2. Methods

The methodological framework for this narrative review was explicitly designed to synthesize and critically evaluate the evidence contained within a predefined, closed corpus of scientific literature provided by the user. Adhering to the foundational principles of this project, this review strictly refrains from incorporating any information from external databases, supplementary literature searches, or the authoring agent's general knowledge base. This circumscribed approach ensures that all interpretations and conclusions are directly traceable to and supported by the provided source documents.

2.1. Literature Sources

The evidence base for this review comprises a collection of approximately 15 peer-reviewed scientific documents. This dataset is qualitatively rich, including a spectrum of evidence types: long-term follow-up results from prospective randomized controlled trials (RCTs), large-scale retrospective and prospective cohort studies, comprehensive systematic reviews, network meta-analyses, and authoritative clinical practice guidelines from leading international bodies such as the European Association of Urology (EAU) (Harding et al., 2025). This curated collection provides a multi-faceted view of the surgical management of SUI, from foundational concepts to the most recent long-term outcome data.

2.2. Study Selection and Eligibility Criteria

A rigorous, criteria-driven selection process was applied to the provided corpus to identify the primary evidence for the core comparative analysis. The objective was to isolate studies that directly address the central research question concerning the long-term comparative outcomes of TVT and TOT.

Primary Inclusion Criterion: The single most important criterion for a study's inclusion in the primary synthesis was the reporting of clinical outcomes with a minimum follow-up period of five (5) years. This temporal threshold was established to ensure that the analysis was genuinely focused on "long-term" results, moving beyond the well-documented short- and medium-term data.

Secondary Inclusion Criteria:

- Population: Studies had to involve adult female patients diagnosed with SUI, which could include urodynamically confirmed SUI or mixed urinary incontinence (MUI) with a dominant stress component.
- Intervention: The study had to evaluate, either directly or as part of a multi-arm trial, the retropubic TVT and/or a transobturator sling (TOT or TVT-O).
- Publication Type: Only full-text, peer-reviewed articles were considered for the primary data synthesis.

Application of Criteria: Studies that met all criteria, such as the 5-year TOMUS follow-up (Kenton et al., 2015), the 16-year RCT analysis by Salo et al. (2023), and the 17-year TVT-O cohort study (Braga et al., 2024), were designated as primary evidence. Systematic reviews focusing specifically on long-term data were also prioritized (e.g., Guillot-Tantay et al., 2023). Other documents, including meta-analyses of short-term data (e.g., Huang et al., 2018), broad guidelines (e.g., Harding et al., 2025), or papers on related topics like pathophysiology (e.g., Falah-Hassani et al., 2021) and diagnostics (e.g., Yande et al., 2016), were utilized as secondary or contextual sources to frame the introduction and support the discussion.

2.3. Data Extraction, Synthesis, and Analysis

A narrative synthesis approach was employed. Relevant data points were manually extracted from the full text of the primary source articles and organized into a thematic framework.

Outcomes of Interest: The primary outcomes extracted for comparison were:

- Efficacy: Divided into objective cure (e.g., negative cough stress test, pad test results) and subjective cure (e.g., patient-reported absence of leakage, validated QoL scores from instruments like UDI and IIQ, and PGI-I scores).

- Safety: Divided into intraoperative and postoperative complications (e.g., bladder perforation, voiding dysfunction, groin pain, mesh erosion) and reoperation rates for either complications or recurrent SUI.

Method of Synthesis: A formal statistical meta-analysis was deliberately not performed. This decision was based on the significant methodological and clinical heterogeneity observed across the included long-term studies, a well-documented challenge in the SUI literature (Wu et al., 2024; Guillot-Tantay et al., 2023):

- Heterogeneity of Definitions: A lack of a standardized definition of "success" or "cure."
- Heterogeneity of Populations: Inclusion of varying proportions of patients with primary versus recurrent SUI, and with or without ISD.
- Heterogeneity of Follow-Up: A wide range of follow-up durations (from 5 to 17 years), making direct pooling of time-point data problematic.
- Methodological Variability: High and variable rates of patient attrition, a major confounder in long-term surgical trials (Kenton et al., 2015).

Given these constraints, a narrative synthesis was the most appropriate and scientifically sound method. This involved a critical summary and interpretation of the findings as reported in each primary study, identifying consistent patterns, trends, and discrepancies. All citations within the text and the final reference list adhere to the APA 7th Edition style format.

3. Literature Review and Synthesis of Findings

An analysis of studies with long-term follow-up (defined as ≥5 years) is essential for a comprehensive understanding of the durability and safety of mid-urethral slings (MUS). The following synthesis compares retropubic tension-free vaginal tape (TVT) and transobturator tape (TOT) based on the available long-term evidence provided.

3.1. Long-Term Efficacy (≥5 Years): Durability of Continence Restoration

The efficacy of an anti-incontinence procedure is a multifaceted construct, evaluated through both objective clinical measures and subjective, patient-centered reports. The long-term literature reveals a fascinating and clinically important divergence between these two domains.

3.1.1. Objective Cure Rates: A Nuanced Comparison

Objective cure, most rigorously defined as the absence of demonstrable urine leakage during a standardized cough stress test, provides a rigorous measure of surgical efficacy. The most robust comparative data come from the 5-year follow-up of the TOMUS. In this trial, Kenton et al. (2015) reported a composite treatment success rate that was 7.9% higher for the TVT group compared to the TOT group (51.3% vs. 43.4%). While this suggests a trend favoring the TVT, the authors cautiously noted that the 95% confidence interval for this difference was wide (−1.4% to 17.2%) and crossed zero, thereby failing to meet the pre-specified criteria for statistical equivalence or superiority. This finding is echoed in a comprehensive network meta-analysis by Chen et al. (2024), which, despite a shorter median follow-up, also failed to find a statistically significant difference in objective success rates between the various sling types.

However, when examining individual cohort studies with very long follow-up periods, the remarkable durability of each sling becomes evident. A prospective cohort study of the inside-out TOT (TVT-O) by Braga et al. (2024) demonstrated an objective cure rate of 80% at an extraordinary 17-year follow-up. Similarly, a 6-year prospective follow-up of the TVT procedure reported an objective success rate of 83% (Lee et al., 2010). This high individual durability likely explains the difficulty in demonstrating a small but consistent difference in large-scale trials; a small superiority margin is hard to detect when both interventions have such a high baseline of success.

3.1.2. Subjective Outcomes: The Primacy of Patient-Reported Success

While objective tests are crucial, the ultimate measure of success is the patient's own perception of their quality of life (QoL) and satisfaction. Here, the long-term evidence is both overwhelmingly positive and remarkably consistent for both TVT and TOT. The 5-year TOMUS data revealed that despite the decline in objective cure rates to around 50%, patient satisfaction remained exceptionally high and statistically similar between the TVT and TOT groups, at 79% and 85%, respectively (Kenton et al., 2015). This crucial observation is strongly supported by the longest-term comparative RCT data available, a 16-year follow-up by Salo et al. (2023), which found no significant difference in subjective outcomes as measured by validated instruments like the Urinary Incontinence Severity Score (UISS). Further reinforcing this, the 17-year Braga

et al. (2024) data for TVT-O showed that 81.4% of patients continued to classify their improvement as "very much" or "much" better on the Patient Global Impression of Improvement (PGI-I) scale.

These findings consistently demonstrate that both procedures provide a profound and lasting subjective benefit. The discrepancy between declining objective "dryness" and sustained subjective success suggests that for most patients, the transition from severe, life-altering incontinence to mild, manageable, or non-existent leakage represents a transformative victory, regardless of whether perfect continence is maintained indefinitely.

3.2. Long-Term Safety Profile and Late-Onset Complications

The fundamental design difference between the TVT and TOT routes was motivated by safety, and the long-term data confirm that their complication profiles remain distinct over time.

3.2.1. Procedure-Specific Complications

The established short-term risks remain consistent in long-term analysis. The retropubic TVT route is unequivocally associated with a higher risk of intraoperative bladder perforation and subsequent postoperative voiding dysfunction (Huang et al., 2018; Bhadana et al., 2017). The transobturator TOT route, while avoiding these risks, is linked to a higher incidence of postoperative groin or thigh pain, which is usually transient but can be a source of significant short-term morbidity (Huang et al., 2018; Chen et al., 2024).

The long-term incidence of *de novo* urgency has been a subject of considerable interest. However, studies with follow-up periods of 16 and 17 years have reported comparable incidence rates between 15% and 18.5% for both sling types, suggesting that this complication is a general risk associated with altering pelvic anatomy and bladder function, or a function of aging itself, rather than a specific consequence of one particular route (Salo et al., 2023; Braga et al., 2024).

3.2.2. Mesh-Related Complications and Reoperation Rates

Mesh Exposure and Erosion: This is the most significant concern related to the use of permanent synthetic mesh. The systematic review by Guillot-Tantay et al. (2023) reported highly heterogeneous 5-year erosion rates (0-7% for TVT; 0-19% for TOT). The most critical data come from the 17-year prospective follow-up by Braga et al. (2024), which demonstrated that the risk of mesh exposure is lifelong, with a substantial number of cases (4 of 7) occurring more than a decade post-surgery. Although the overall incidence was low (10%) and all cases were managed conservatively with partial excision, this finding reframes the risk profile from a short-term surgical risk to a long-term implant-related risk.

Reoperation for Recurrent SUI: This outcome is the clearest indicator of long-term treatment failure. Here, the evidence strongly points towards a durability advantage for the TVT. The RCT by Schierlitz et al. (2012) in the high-risk ISD population provides the most powerful evidence, showing that the risk of repeat surgery was 15 times higher for patients who received a TOT compared to a TVT at 3 years (20% vs. 1.4%). While this effect is most pronounced in this challenging cohort, the 5-year TOMUS data showed a similar, though non-significant, trend in a general SUI population (Kenton et al., 2015).

3.3. Special Population: Outcomes in Intrinsic Sphincter Deficiency (ISD)

In the subpopulation of women with ISD, the debate over sling choice largely dissipates. For these patients, whose urethral sphincter is inherently weak, the surgical procedure must provide a greater degree of support and coaptation. The evidence from comparative studies is clear and consistent: the retropubic TVT is the superior procedure. The RCT by Schierlitz et al. (2012) and the retrospective study by Kim et al. (2016), which reported a 95.2% success rate for TVT versus 82.7% for TOT in patients with urodynamically confirmed ISD, provide high-level evidence supporting this conclusion. The prevailing biomechanical theory is that the TVT's vertical "hammock" orientation provides a more effective urethral coaptation mechanism for a deficient sphincter, a level of support that the more horizontal TOT sling may be unable to replicate long-term (Kim et al., 2016; Schierlitz et al., 2012; Falah-Hassani et al., 2021).

4. Discussion

The accumulated long-term evidence on mid-urethral slings marks a critical juncture in the surgical management of SUI. After two decades dominated by the use of TVT and TOT procedures, the clinical discourse has shifted from debating their initial equivalence to understanding their distinct long-term trajectories of durability and safety. This review of the long-term literature reveals that while both sling types provide substantial and lasting subjective benefits to patients, a critical analysis uncovers a fundamental trade-off between the early safety profile of the transobturator approach and the superior long-term durability of the retropubic route.

4.1. The Durability-Safety Trade-Off: A Long-Term Perspective

The very genesis of the TOT was a direct response to the safety concerns associated with the blind retropubic passage of the TVT (Lee, Lee, & Lee, 2010; Chen et al., 2024). Short- and medium-term data have unequivocally validated this design premise. Meta-analyses consistently report that TOT significantly reduces the risk of intraoperative complications such as bladder perforation and subsequent postoperative voiding dysfunction (Huang et al., 2018; Bhadana et al., 2017). This initial safety advantage made the TOT an attractive alternative for many surgeons and patients.

However, the long-term data synthesized in this review compel a more circumspect evaluation of this trade-off. The findings from high-quality, long-term studies suggest that the price of this initial safety may be a compromise in long-term efficacy. The 5-year TOMUS trial, a cornerstone of comparative evidence, showed a 7.9% higher treatment success rate for TVT, a clinically relevant, though not statistically definitive, trend (Kenton et al., 2015). This signal is amplified in the high-risk ISD population, where the 3-year RCT by Schierlitz et al. found a striking 15-fold higher risk of reoperation for recurrence with TOT compared to TVT (Schierlitz et al., 2012). This suggests that the biomechanical properties of the two slings are not interchangeable. The more vertical, "hammock-like" support provided by the retropubic TVT offers a more effective urethral backstop. This "constructive obstruction" appears vital for maintaining continence in the long term, especially when the intrinsic urethral sphincter mechanism is compromised (Kim et al., 2016; Falah-Hassani et al., 2021). The TOT's more horizontal vector, while safer to place, may provide insufficient support to withstand decades of physical stress, leading to a higher rate of late recurrence.

4.2. The Challenge of Defining and Measuring Success

A pervasive and critical limitation across the entire body of SUI literature is the lack of a standardized definition of surgical success. As critically reviewed by Wu et al. (2024), this issue has been a "persistent challenge" for decades, impeding robust cross-study comparisons and meta-analyses. One study's "cure" is another's "improvement." This methodological heterogeneity explains, in part, the divergence seen between objective data and patient-reported outcomes. The 5-year TOMUS data, for instance, showed high patient satisfaction (79-85%) despite objective success rates nearing 50% (Kenton et al., 2015). This implies that patients may value a significant reduction in symptom bother and improvement in QoL over achieving complete dryness. This finding is of profound clinical importance, suggesting that the primary goal of surgery should be a mutually agreed-upon improvement rather than a clinician-defined "cure."

4.3. Lifelong Risks: The Reality of Permanent Implants

The analysis of very long-term data (beyond 10 years) has been crucial for understanding the lifecycle of these permanent implants.

Mesh Exposure: The most significant finding from this long-term perspective is that the risk of mesh exposure is lifelong. The 17-year data from Braga et al. (2024) on the TVT-O are landmark in this regard, demonstrating that a substantial portion of exposures occurred more than 10 years post-implantation. While the overall incidence was low (10%) and the clinical consequences were manageable (requiring only local revision), this fundamentally alters the informed consent conversation. Patients must be made aware that the risk, while small, does not diminish over time.

De Novo Urgency: The onset of new urgency symptoms is another key long-term concern. However, comparative studies with 16 and 17 years of follow-up have shown no significant difference in incidence between TVT and TOT, with rates stabilizing around 15-18% (Salo et al., 2023; Braga et al., 2024). This suggests that de novo urgency may be a consequence of the general alteration of pelvic anatomy and bladder function caused by any sling procedure, or a result of the natural aging process, rather than a specific complication of one particular route.

4.4. Clinical Implications and the Imperative of Shared Decision-Making

The evidence synthesized in this review mandates a departure from a "one-size-fits-all" mentality and a move toward a sophisticated, individualized approach rooted in shared decision-making. The discussion with a patient considering MUS surgery should now explicitly cover:

Patient-Specific Risk Profile: A thorough preoperative evaluation, including urodynamics where indicated (e.g., suspicion of ISD or previous failed surgery), is essential to stratify the patient's risk of failure (Yande et al., 2016). The findings for patients with ISD are so stark that the TVT should be strongly recommended as the procedure with a higher likelihood of long-term success (Schierlitz et al., 2012; Kim et al., 2016). This aligns with guidelines that recommend the retropubic route for a hypotonic urethra (Reisenauer et al., 2013).

Balancing Efficacy and Safety: For patients without specific risk factors, the choice between TVT and TOT is a discussion of risk tolerance. Does the patient prioritize minimizing the immediate risks of surgery (bladder injury, voiding issues), favoring the TOT? Or does she prioritize maximizing the chance of long-term durability and avoiding a potential reoperation for recurrence years down the line, favoring the TVT? There is no single correct answer, and the decision must align with the patient's values.

The Lifelong Nature of the Implant: The informed consent process must be unequivocal about the permanence of the implant and the lifelong, albeit low, risk of late-onset complications like mesh exposure. This understanding is crucial for ensuring patients are vigilant and report any new or changing symptoms in the decades following their surgery.

In conclusion, the era of viewing TVT and TOT as simply interchangeable is over. They are distinct tools, each with its own merits and drawbacks that play out over the lifespan of the implant. The TVT emerges as a more robust, durable sling, making it the evidence-based choice for high-risk cases like ISD. The TOT remains an excellent option for many women, offering a superior initial safety profile. The art of modern SUI surgery lies not in universal preference for one technique, but in the surgeon's ability to expertly perform both and to guide the patient through a comprehensive shared decision-making process to select the procedure that best aligns with her anatomy, risk factors, and personal priorities.

5. Conclusions

This extensive narrative review, synthesizing over two decades of clinical evidence on the surgical management of SUI, elucidates a critical and nuanced understanding of the long-term roles of the retropubic TVT and the transobturator TOT. The analysis of studies with follow-up periods extending from five to over seventeen years confirms that both procedures stand as highly effective and durable interventions. For the vast majority of women, both sling types deliver a profound and lasting improvement in quality of life and subjective satisfaction, a benefit that endures far beyond the first postoperative decade. However, the most salient conclusion drawn from this mature body of evidence is that the TVT and TOT are not interchangeable. They represent distinct surgical strategies, each with a unique long-term profile of efficacy, safety, and risk, demanding a sophisticated and individualized approach to patient selection and surgical decision-making.

The central finding of this long-term analysis is the crystallization of a fundamental trade-off between initial surgical safety and sustained, long-term durability. The transobturator route (TOT), born from a desire to mitigate the risks of the blind retropubic passage, successfully achieves its primary safety objective by significantly reducing the incidence of bladder perforation and postoperative voiding dysfunction. This established safety advantage, however, is counterbalanced by evidence suggesting that the retropubic TVT provides superior long-term durability, evidenced by a lower rate of reoperation for recurrent SUI, particularly in women with intrinsic sphincter deficiency (ISD). For this high-risk population, the TVT should be considered the procedure of choice based on current evidence.

Late-onset complications, while infrequent, remain a lifelong consideration for any permanent implant. The risk of mesh exposure, though low, continues to exist more than a decade after surgery, a crucial finding that must inform the patient counseling process.

Ultimately, the choice between TVT and TOT should be the result of a thorough and individualized shared decision-making process. This process must weigh the patient's specific anatomical characteristics, risk factors (such as ISD), and personal priorities against the distinct long-term efficacy and safety profiles of each procedure. The surgeon's experience and ability to expertly perform both techniques are paramount to achieving optimal outcomes. The continued heterogeneity in outcome reporting remains a significant challenge in the field, and a collective move toward standardized, patient-centered definitions of success is imperative for future research to definitively guide clinical practice.

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Authors do not report any disclosures.
Authors' contribution:
Conceptualization: Michał Pietrasz, Patryk Iglewski,
Methodology:, Michał Kociński, Anna Komarczewska
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