

When minimally invasive BPH therapies fail, what's next?

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Minimally invasive surgical therapies (MIST) for benign prostatic hyperplasia (BPH) offer a compelling alternative to traditional resection or enucleation, particularly for frail patients or those prioritising sexual function preservation. These procedures, often performed under local anaesthesia, have gained traction across Europe. But what happens when these less aggressive interventions fall short? A narrative review from EAU endourology, published in World Journal of Urology, explores the market of retreatment options following MIST failure.¹

KEY TAKEAWAYS

- **The Pivot:** Repeat minimally invasive surgical therapies are technically feasible for BPH recurrence after initial MIST failure, but conventional approaches like TURP remain critical for complex cases.
- **The Data:** Retreatment rates after MIST vary significantly, from 0% to 28.6% for PAE, 0, 6.7% for Aquablation, 1, 6.2% for Rezum, and 2, 20% for Prostatic Urethral Lift (PUL).
- **The Action:** Clinicians should determine the exact cause of treatment failure before selecting retreatment, considering repeat MIST for BPH recurrence and conventional procedures for concomitant conditions or severe LUTS.

Benign prostatic hyperplasia affects millions of men globally, causing bothersome lower urinary tract symptoms (LUTS) that significantly impair quality of life. While medical management with alpha-blockers or 5-alpha reductase inhibitors is often the first line, many patients eventually require surgical intervention. Traditional transurethral resection of the prostate (TURP) or open prostatectomy offer high efficacy but carry risks of sexual dysfunction, bleeding, and longer recovery times. This led to the development of MIST, designed to mitigate these drawbacks.¹

The MIST market includes a range of procedures, each with distinct mechanisms and indications. Water vapour thermal therapy (Rezum) uses steam to ablate prostatic tissue. Prostatic urethral lift (PUL, UroLift) involves implanting permanent sutures to compress the prostatic lobes and open the urethra. Aquablation employs a high-velocity waterjet, guided by real-time imaging, to precisely ablate prostatic tissue. Other MIST options include temporary implantable nitinol devices (iTIND) and prostatic artery embolisation (PAE). These therapies aim to reduce prostatic volume and improve urinary flow while preserving ejaculatory and erectile function.¹

Understanding MIST Failure and Retreatment

The EAU endourology review systematically examined outcomes following MIST, focusing on the need for retreatment. Researchers conducted a literature search across PubMed (Medline) and Google Scholar, using terms such as

"Aquablation OR PUL OR iTIND OR PAE OR Rezum) AND retreatment". They included articles that reported reoperation type and its rate after MIST. The review specifically excluded iTIND from detailed analysis of repeat MIST feasibility due to the limited number of clinical trials available for this modality.¹

The review highlighted that while MIST procedures offer advantages, their risks of clinical failure may be considerably higher compared to standard modalities. This makes assessing the feasibility of repeat MIST important for patient outcomes for patients requiring further intervention. The authors noted that literature detailing the specific types of retreatment procedures and their outcomes remains sparse, with reported retreatment rates varying widely depending on the initial MIST performed.¹

For prostatic artery embolisation (PAE), retreatment rates ranged from 0% to 28.6%. Aquablation demonstrated lower retreatment rates, between 0% and 6.7%. Water vapour therapy (Rezum) had rates from 1% to 6.2%. Prostatic urethral lift (PUL) showed a broader range, from 2% to 20%. These figures show the variability in long-term durability across different MIST options, and clinicians should consider these ranges when discussing initial treatment choices with patients.¹

Choosing the Right Retreatment Strategy

The important step in managing clinical failure after MIST is to determine the exact cause of the initial treatment's inadequacy. This diagnostic clarity guides the subsequent therapeutic choice. If persistent LUTS are solely attributable to BPH, such as incomplete treatment due to deviation from surgical protocols, untreated median lobe during the initial MIST, or genuine BPH recurrence, then repeat MIST may be an appropriate and technically feasible option.¹

But the picture changes if concomitant conditions are suspected. Urethral stricture, bladder neck sclerosis, or necrotic tissue after a previous procedure can all contribute to ongoing LUTS. In such scenarios, postoperative cystourethroscopy is indicated. Combining this diagnostic endoscopy with a transurethral resection of the prostate (TURP) may be a more reasonable approach. TURP offers both diagnostic and therapeutic capabilities, allowing for direct visualisation and treatment of these complicating factors.¹

TURP also remains the preferred strategy for patients presenting with severe LUTS, regardless of the suspected cause of MIST failure. Its established efficacy and ability to provide significant symptom relief make it a reliable option when less invasive approaches have failed or are deemed insufficient. This aligns with the principle of choosing the most effective intervention for the patient's current clinical state, even if it means moving to a more invasive procedure.¹

The review emphasised that repeat MIST is technically feasible for all modalities reviewed, with the exception of iTIND, where data remains insufficient. For instance, a patient who initially underwent PUL and experiences recurrence due to prostatic regrowth might be a candidate for a repeat PUL or even a different MIST like Rezum or Aquablation, provided the underlying cause is purely BPH-related. This flexibility allows for a tailored approach, preserving the benefits of minimal invasiveness where possible.¹

The choice between repeat MIST and conventional approaches also hinges on patient preferences. Some patients may prioritise minimal invasiveness, preservation of sexual function, or reduction of operational risk, even if it means a potentially higher chance of future retreatment. For these individuals, repeat MIST (PUL, Rezum, or PAE) could be the preferred path. Other patients, however, may seek maximum durability and effectiveness, even if it entails a more invasive procedure. For them, TURP or Aquablation might be the better choice, offering a more definitive solution. Clinicians should engage in a shared decision-making process, weighing these factors carefully. The implant option

for non-refractory patients with urgency incontinence, for example, highlights the importance of patient preference in urological interventions.¹

Minimising the Need for Re-Intervention

The authors concluded that the best way to minimise the need for re-intervention is to choose the appropriate primary treatment according to evidence-based guidelines and to ensure proper surgical training. This highlights the importance of careful patient selection for initial MIST procedures. Not all patients are ideal candidates for every MIST, and a thorough pre-operative assessment, including prostate size, presence of a median lobe, and overall patient health, is important for treatment success. For example, patients with very large prostates might be better served by Aquablation or even TURP from the outset, rather than a less ablative MIST with a higher likelihood of failure.¹

Surgical training also plays a significant role. The learning curve for MIST procedures can be steep, and operator experience directly impacts outcomes. Ensuring surgeons are adequately trained and proficient in the chosen MIST technique can reduce the incidence of incomplete treatments and subsequent failures. This is particularly relevant for newer technologies where widespread experience may still be developing.¹

The review did not examine the specific mechanisms of failure for each MIST, which represents a limitation.

Understanding whether failure is due to insufficient tissue ablation, prostatic regrowth, or a missed anatomical feature would further refine retreatment strategies. For instance, if a patient undergoes Rezum and experiences recurrence, knowing if it was due to inadequate steam delivery or rapid regrowth could inform the choice between a repeat Rezum or a different modality. The review also did not provide detailed outcome data for repeat MIST procedures themselves, making it difficult to quantify their long-term efficacy compared to conventional retreatment.¹

Still, the narrative review provides a valuable framework for clinicians navigating the complex decisions surrounding MIST failure. It reinforces that while MIST offers significant benefits, it is not a one-size-fits-all solution, and a thoughtful, individualised approach to retreatment is paramount. The decision matrix must incorporate the cause of failure, patient symptoms, and patient preferences, balancing invasiveness with durability. For a comprehensive understanding of general practice, the Oxford Handbook of General Practice, 5th Edition can be an invaluable resource for clinicians.

The review also did not specifically address the economic implications of repeat procedures. While MIST may have lower initial costs or shorter hospital stays, the cumulative cost and patient burden of multiple interventions could be substantial. This is a factor that often influences patient and healthcare system decisions, especially in resource-constrained environments. The long-term cost-effectiveness of various retreatment pathways remains an area requiring further investigation.¹

The authors also did not provide a detailed breakdown of complications associated with repeat MIST versus conventional retreatment. While initial MIST procedures are generally associated with fewer complications than TURP, the risk profile of a repeat MIST on previously treated tissue might differ. This information would be important for fully informing patients about the risks and benefits of each retreatment option. Understanding prostatectomy leakage, for instance, highlights the need for detailed complication data.¹

Future Directions in MIST Management

The sparse literature on detailed retreatment outcomes after MIST points to a clear need for more robust prospective studies. Future research should aim to collect granular data on the specific causes of MIST failure, the types of retreatment performed, and their long-term efficacy and safety profiles. This would allow for the development of more precise algorithms for managing MIST failures, moving beyond the current narrative review's general recommendations.¹ Comparative effectiveness research directly comparing repeat MIST with conventional procedures like TURP or Aquablation in specific failure scenarios would also be highly valuable. Such studies could provide the evidence base needed to definitively guide clinical practice, ensuring that patients receive the most appropriate and durable treatment for their recurrent BPH symptoms. The role of advanced imaging techniques in identifying the cause of failure, such as multiparametric MRI, also warrants further exploration.¹

CLINICAL IMPLICATIONS

The variability in retreatment rates across minimally invasive surgical therapies for BPH is a stark reminder that 'minimally invasive' does not equate to 'minimally complex' in terms of long-term management. Clinicians must move beyond the initial appeal of these procedures and consider the full lifecycle of patient care, including the potential for failure and subsequent interventions. This demands a more rigorous approach to patient selection and pre-operative counselling.

The distinction between BPH recurrence and other concomitant conditions driving LUTS is paramount. A patient with a urethral stricture after a Rezum procedure needs a different approach than one whose prostate simply regrew. This necessitates a diagnostic workup that goes beyond symptom assessment, often requiring cystourethroscopy to pinpoint the exact cause of failure before committing to a retreatment strategy.

For industry, the wide range of retreatment rates suggests an opportunity for innovation in MIST durability. Developing technologies that offer both minimal invasiveness and sustained efficacy would be a significant step forward. But until then, the onus is on manufacturers to provide clear data on long-term outcomes and retreatment pathways, rather than solely focusing on initial success rates.

Patients, meanwhile, need transparent discussions about the potential for retreatment, even with MIST. While the promise of sexual function preservation is compelling, they must understand that a less invasive initial procedure might mean a higher chance of needing another intervention down the line. This shared decision-making process should weigh immediate benefits against the long-term commitment to managing their BPH.

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REFERENCES

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