Case Report

Holmium laser enucleation of the prostate as a secondary surgery following prostatic urethral lift

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Abbreviations & Acronyms
BPH = benign prostatic hyperplasia
HoLEP = holmium laser enucleation of the prostate
IPSS = International Prostate Symptom Score
PUL = prostatic urethral lift
QOL = quality of life

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Introduction: Prostatic urethral lift is a treatment option for benign prostatic hyperplasia, yet information on surgeries following this procedure is scarce.
Case presentation: A 71-year-old man with persistent urinary retention following prostatic urethral lift underwent a secondary holmium laser enucleation of the prostate. The morcellation procedure, complicated by the presence of implants from the previous surgery, broke the morcellator blade. The fragmented blade was successfully retrieved without any organ damage. Postoperatively, the patient encountered no complications and showed improvement in his urinary symptoms.
Conclusion: This case highlights the potential risk of device breakage when a secondary surgery, specifically the morcellation process, is performed following prostatic urethral lift. Care must be taken to prevent interaction between the implants and the morcellator. Our case demonstrates the efficacy of holmium laser enucleation of the prostate as a salvage surgical intervention for patients in whom prostatic urethral lift has failed.

Key words: benign prostatic hyperplasia, holmium laser enucleation of the prostate, lower urinary tract symptoms, prostatic urethral lift, salvage treatment.

Keynote message

Holmium laser enucleation of the prostate has been shown to be an effective salvage surgical strategy for patients with failed prostatic urethral lift. This case, however, emphasizes the potential risk of device breakage, particularly during the morcellation procedure. An increased focus on this complication is necessary to enhance the safety and efficiency of surgical procedures.

Introduction

PUL utilizing the UroLift system (NeoTract, Pleasanton, CA, USA) offers a minimally invasive procedure for BPH. The procedure involves the use of nonabsorbable implants to retract obstructive prostate lobes, which alleviates urinary symptoms linked to BPH.[1] Despite its effectiveness, PUL demonstrates a failure rate of 7% at 2 years and 14% at 4 years,[2] leading to the need for secondary BPH procedures in some patients. A noteworthy study reported that 13.6% of cases required surgical retreatment within 5 years.[3]

HoLEP is a reliable treatment option for BPH, independent of prostate size. While there are some reports supporting the effectiveness of HoLEP as a salvage procedure following unsuccessful PUL, such studies are institution-specific.[4–6] Particularly in Japan, where the UroLift system was only introduced in 2022, there are no published reports on HoLEP as a secondary procedure post-PUL.

This study presents a case of HoLEP as a salvage procedure following failed PUL. Notably, during the surgery, we encountered a unique complication in which the morcellator blade broke, which, to our knowledge, has not been previously reported in the literature.

Case presentation

A 71-year-old man with benign prostatic obstruction was referred for further treatment due to persistent lower urinary tract symptoms. The patient had previously experienced urinary retention, leading to PUL procedure with the insertion of seven implants at a different regional facility. However, his symptoms did not improve, and a trial without a catheter was unsuccessful. Magnetic resonance imaging revealed a prostate volume of 124 mL with a prominent median lobe. Despite being on dutasteride, tadalafil, and distigmine, the patient's urinary symptoms lingered, requiring him to perform clean intermittent self-catheterization. Five months post-PUL, we conducted HoLEP using the Lumenis Pulse (Lumenis, Yokneam, Israel) 120 H laser system. The laser settings were adjusted to 2.6 J and 30 Hz with a short pulse and 2.0 J and 40 Hz using the Moses 2.0 mode.

Despite the prior PUL, the adenoma nearly completely obstructed the prostatic urethra. We performed the enucleation procedure using the previously defined anteroposterior dissection technique.[7] There were no challenges to the enucleation process. While suture threads penetrated the separation surface, no adhesions were observed. The PUL threads were rapidly vaporized using a laser (Fig. 1). Consequently, we successfully completed the en-bloc enucleation in 30 min, with a tissue weight of 65 g and an enucleation rate of 2.2 g per minute.

During the morcellation process, we faced difficulties due to the PUL implants, which jammed the morcellator (Fig. 2). In some instances, temporary halt of the morcellation process allowed the adenoma containing the implants to be dislodged into the bladder, but in others, manual removal of the implants was required after retracting the nephroscope. Ultimately, the morcellator blade's jaw jammed and broke upon contact with the implants (Fig. 3). We carefully retrieved the blade fragment from the prostatic bed using a curette (Fig. 4). Although retrieving the fragment was demanding and time-consuming, it resulted in no injuries to the bladder or urethra. We proceeded with morcellation at a considerably slower pace, taking care to prevent any interaction between the implants and the morcellator. The implants embedded within the adenoma were extracted using a curette. The total morcellation time, including the removal of all adenoma and the broken fragment, was 32 min, with a morcellation rate of 2.0 g per minute, underscoring the significant challenges encountered during the procedure.

At the 1-month follow-up, uroflowmetry showed a voided volume of 134 mL and a peak flow rate of 18.9 mL/s. The postvoid residual volume was only 22 mL. The IPSS and QOL scores were 2 and 1, respectively. The patient reported no incontinence and used only one pad for safety. At the 3-month follow-up, the peak flow rate had improved to 27.9 mL/s, and the postvoid residual volume was zero. The IPSS and QOL scores remained favorable at 2 and 0, respectively.

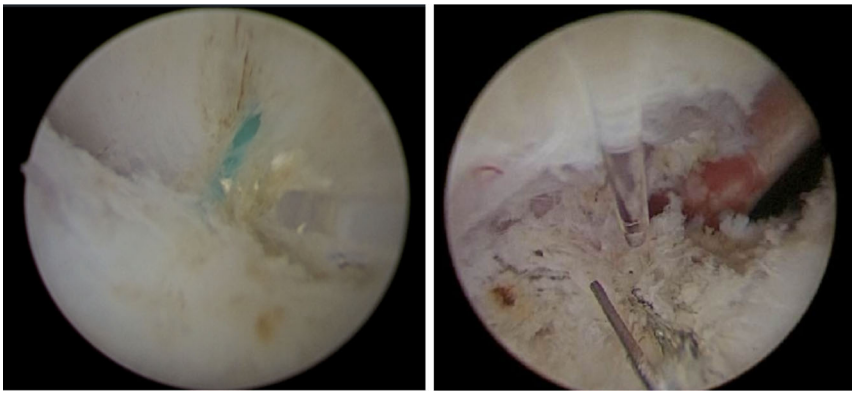

Fig. 1 Sutures of PUL implants were easily divided by laser energy. The metal clips were also clearly identifiable.

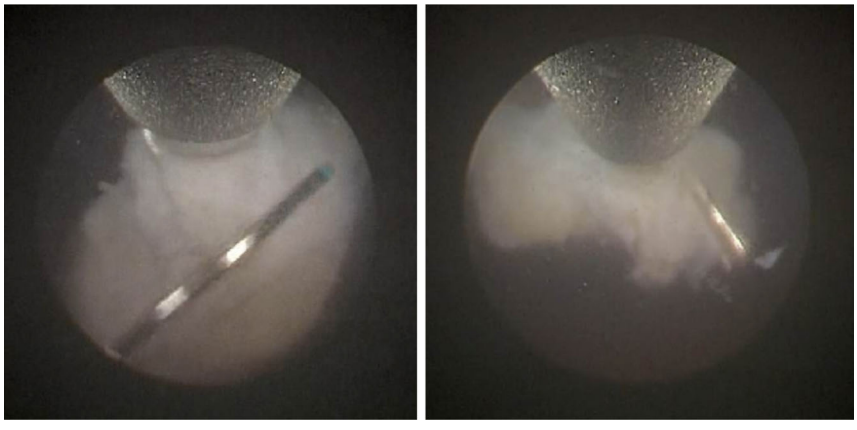

Fig. 2 Morcellation system jammed when the implants lodged in the morcellator.

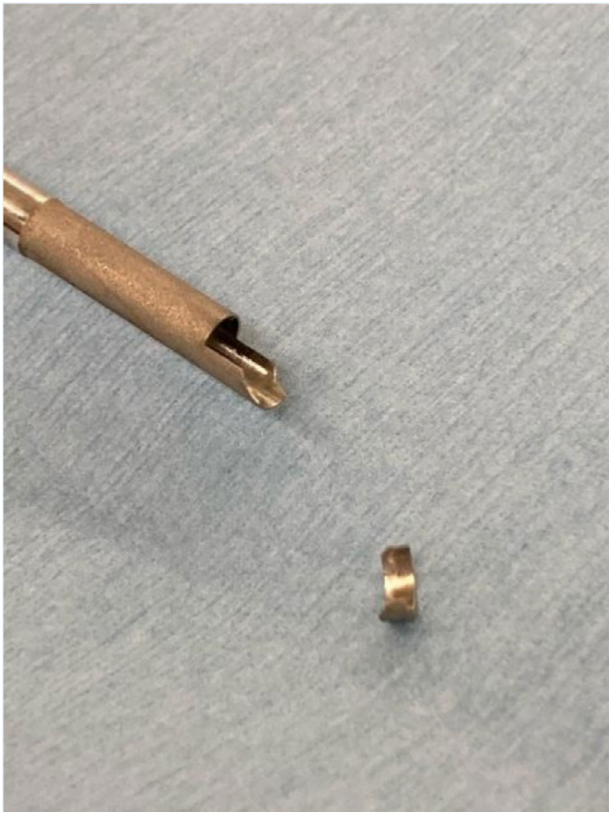

Fig. 3 Jaw of the morcellator blade broke due to the PUL implant.

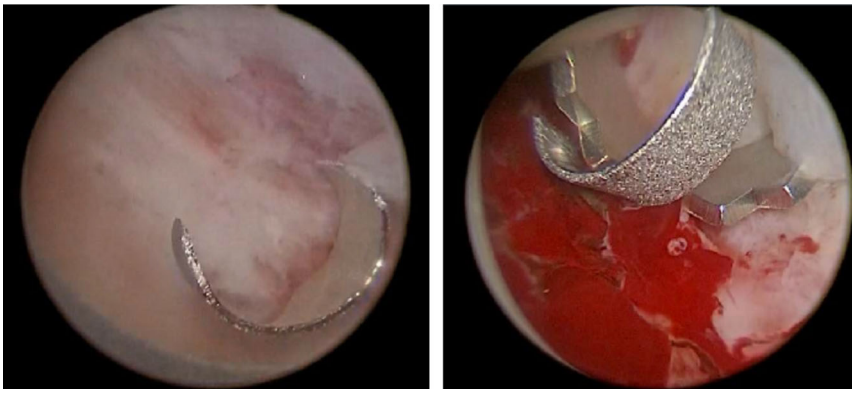

Fig. 4 Fragment of broken morcellator was retrieved using a curette.

Discussion

Our study provides insight into two critical clinical aspects of HoLEP as a secondary procedure following PUL. First, our experience supports the effectiveness of HoLEP in managing patients unresponsive to PUL. In line with prior reports,[4–6] we observed substantial enhancements in lower urinary tract symptoms and successful removal of the catheter post-HoLEP. These findings underscore HoLEP's potential as a salvage treatment option for patients who experience insufficient relief following PUL.

Second, we encountered a significant complication during the morcellation process. Our experience highlights the potential for device breakage when employing a reciprocating morcellator in the setting of HoLEP post-PUL. While this complication has not been reported previously, it emphasizes the need for caution during morcellation due to the risk of implant entrapment and subsequent blade jamming. Should PUL tabs be encountered, they should be promptly retrieved using a curette or a similar tool. If a tab is embedded within the adenoma, morcellation should reduce it to a manageable size before extraction. During morcellation, careful monitoring is important to avoid contact between the blade and the tab. The choice of morcellator is pivotal, as oscillating morcellators have a lower risk of implant entrapment compared with reciprocating morcellators.[6] However, it is essential to note that reciprocating morcellators are more prevalent in Japan, as seen in our case.

One point of contention in our report is the initial PUL treatment performed by a previous physician, with the rationale behind this treatment decision remaining unclear. PUL is conventionally indicated for prostatic hyperplasia with a prostate volume of less than 100 mL, especially in cases where overall health or physical capability might not suffice for surgery. The Japanese Urological Association highlights that PUL may not deliver adequate treatment results for prostate volumes exceeding 100 mL. While PUL presents multiple advantages, including outpatient treatment possibility and avoiding postoperative catheterization, our case demonstrates some technical concerns regarding secondary interventions. Therefore, it is crucial to adhere to PUL treatment guidelines.

To improve our understanding of HoLEP as a secondary procedure post-PUL, additional studies are required. Collecting more reports and data on long-term outcomes will assist in determining the safety and efficacy of this approach. Furthermore, an investigation into potential challenges and complications, like device breakage during morcellation, will enhance surgical techniques and patient outcomes.

Conclusion

HoLEP has emerged as an effective salvage procedure for patients who have experienced failed PUL. It is important to be mindful of the potential risk for device breakage, particularly during the morcellation procedure.

Acknowledgments

None.

Author contributions

Takato Nishino: Conceptualization; data curation; investigation; project administration; visualization; writing – original draft. Fumiyasu Endo: Conceptualization; project administration; resources; supervision; validation; writing – review and editing. Daiki Nakama: Resources; writing – review and editing. Masato Sakurai: Resources; writing – review and editing. Koki Tominaga: Resources; writing – review and editing. Eri Fukagawa: Resources; writing – review and editing. Masayuki Sano: Resources; writing – review and editing. Kazutaka Narimoto: Project administration; resources; validation; writing – review and editing. Masaki Shimbo: Project administration; resources; validation; writing – review and editing. Kazunori Hattori: Project administration; resources; supervision; validation; writing – review and editing.

Conflict of interest

The authors declare no conflict of interest.

Approval of the research protocol by an Institutional Reviewer Board

Not applicable.

Informed consent

Informed consent was obtained from the subject.

Registry and the Registration No. of the study/trial

Not applicable.

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