

Case Report

Two cases of pelvic hematoma after prostatic urethral lift surgery

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Abbreviations & Acronyms

BPH = benign prostatic hyperplasia
 CT = computed tomography
 IPSS = International prostate symptom score
 LUTS = lower urinary tract symptoms
 MIST = minimally invasive surgical treatment
 PUL = prostatic urethral lift
 PV = prostate volume
 QOL = quality of life

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Introduction: There are few reports of pelvic hematoma after prostatic urethral lift. Here, we report two cases of pelvic hematoma in Japan.

Case presentation: The first case was a 71-year-old man with benign prostatic hyperplasia who underwent prostatic urethral lift. Although the procedure was uneventful, he experienced lower abdominal pain the day after the operation. CT revealed a hematoma in the right pelvis; however, it was manageable with conservative treatment. The second case was a 68-year-old man. The procedure was uneventful; however, 6 days after the operation, a subcutaneous hematoma appeared in the lower abdomen. CT revealed a hematoma in the left pelvis. We then performed pelvic hematoma removal surgery.

Conclusions: Pelvic hematomas after PUL may require attention, particularly in men with the narrow pelvises. Appropriate compression of the prostate and a high lithotomy position procedure could effectively avoid the occurrence of pelvic hematomas.

Key words: adverse events, benign prostatic hyperplasia, pelvic hematoma, prostatic urethral lift, Urolift.

Keynote message

Pelvic hematomas after PUL would be conservatively treated in most cases; however, these lesions should be paid great attention. In previous reports, age, prostate volume, and the number of implants were not associated with the occurrence of pelvic hematomas. Appropriate compression of the prostate and a high lithotomy position during the PUL procedure could avoid the occurrence of severe complications, such as pelvic hematoma.

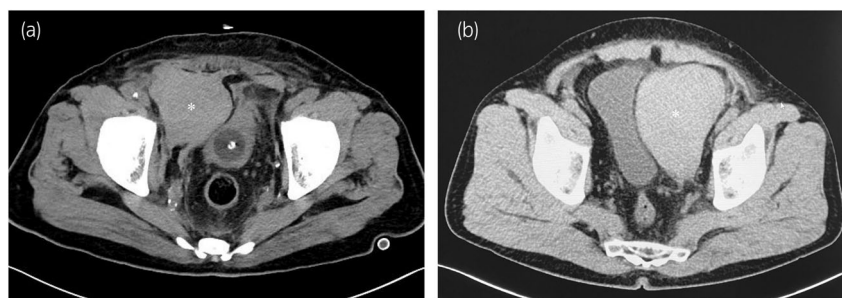
Introduction

PUL using the UroLift® System (Teleflex, Inc., Wayne, PA, USA) is one of the MISTs for BPH, which provides short operative time and rapid relief of LUTS compared with the conventional treatments.^{1,2} Several meta-analyses have reported that PUL has fewer serious adverse events and was superior in preserving sexual function than conventional surgeries and showed similar retreatment rates than other MISTs.^{3,4} The most frequently reported complications of PUL are spontaneously resolving dysuria and hematuria; however, the occurrence of major complications, such as pelvic hematoma, has rarely been reported.^{5–10} We describe two Japanese cases of pelvic hematoma after PUL. These patients underwent conservative treatment or hematoma removal. Furthermore, we discussed the prevention of the severe complications, such as pelvic hematoma, after PUL.

Case presentation

The first case was a 71-year-old man with BPH, managed with silodosin and dutasteride. Pre-operative uroflowmetry demonstrated a maximum urinary flow rate of 3.7 mL/s and a residual urine of 161 mL. The patient had an IPSS of 29 points and a QOL score of 6. Transrectal ultrasonography revealed a 45-cm³ PV. The patient had respiratory dysfunction due to chronic obstructive pulmonary disease, and after discussing various surgical options with him, he

Fig. 1 CT scan of the pelvic hematoma in patients who underwent PUL. (a) The white asterisk denotes the right-pelvic-cavity-extending hematoma in the first case. (b) The white asterisk denotes the left-pelvic-cavity-extending hematoma in the second case.



preferred PUL surgery under local anesthesia. Intraoperatively, implants were placed in each lateral lobe at the 10 and 2 o'clock positions of the proximal, and each 3 and 9 o'clock stacking positions with four implants inserted. The procedure was completed uneventfully within 31 min. On postoperative day #1, the patient presented with lower abdominal pain. Blood tests subsequently revealed that his hemoglobin level had decreased to 11.6 g/dL from a baseline of 14.2 g/dL. CT demonstrated 173-cm³ hematoma in the right pelvic cavity (Fig. 1a). The patient's vital signs were within the normal range, and no changes in the hemoglobin level or hematoma diameter were observed on CT on the next day; therefore, a conservative management policy was decided. After 7 days, the lower abdominal pain resolved, and the patient was discharged.

The second case was a 68-year-old man with BPH, managed with tamsulosin and tadalafil. Preoperative uroflowmetry demonstrated a maximum urinary flow rate of 18.2 mL/s and a residual urine of 23 mL. The patient had an IPSS of 15 points and a QOL score of 5. Transrectal ultrasonography revealed a 30-cm³ PV. The patient was unsatisfied with the efficacy of the medications prescribed and chose to undergo PUL. Intraoperatively, implants were placed in each lateral lobe at the 10 and 2 o'clock positions of the proximal, and each 3 and 9 o'clock stacking positions with four implants inserted. The procedure was completed uneventfully within 12 min. While in the recovery room, the patient had hypotension with a systolic blood pressure of 70 mmHg, which was manageable with hydration and leg elevation. The patient was discharged the next day. On postoperative day #6, the patient presented with a lower abdominal subcutaneous hematoma. Blood tests

subsequently revealed that his hemoglobin level had decrease to 11.8 g/dL from a baseline of 14.4 g/dL. CT revealed a 238-cm³ hematoma in the left pelvic cavity (Fig. 1b). The patient underwent surgery for the removal of the pelvic hematoma according to his preferred policy.

Discussion

The L.I.F.T. study, a randomized controlled trial of UroLift®, has reported a 44% reduction in the IPSS, 50% improvement in the QOL score, and 44% improvement in Qmax at 2–4 weeks, which persisted for 5 years after the procedure.^{1,2} Furthermore, there were few adverse events that have been reported, such as bladder neck contracture, stress urinary incontinence, and sexual dysfunction, in addition to the short length of catheterization and hospitalization in the PUL procedure compared with those in the transurethral resection of the prostate.¹¹ Twenty-seven cases of pelvic hematoma after PUL have been reported since 2015 on the Food and Drug Administration's website for UroLift® MAUDE. Furthermore, as of 2023, NeoTract/Teleflex reported that over 200 000 patients have been treated with UroLift®, culminating in a reported 0.0135% incidence of hematoma.¹² To the best of our knowledge, only six cases of the occurrence and management of pelvic hematoma after PUL have been reported, as shown in Table 1 together with our cases.^{5–10} In these case reports, age (66–83 years old), PV (14–45 mL), and the number of implants (2–5) seemed to be not associated with the occurrence of pelvic hematomas, suggesting that compression of the prostate using UroLift® and patient position during surgery are the main risk factors for the occurrence of pelvic hematoma after PUL.

Table 1 Summary of 6 reported cases and our cases of pelvic hematoma after PUL

Reference	Age (years)	Patient region	Anticoagulant	PV (mL)	No. of implants	Decrease in Hb (g/dL)	Hematoma volume (mL)	Hematoma location	Treatment
5	66	North America	No	—	2	—	—	Bilateral	Conservative
6	70	North America	No	—	—	6	1,500	Retzius space	Laparotomy Hemostasis
7	83	North America	Yes	25	5	2	—	Retzius space	Transfusion, Conservative
8	60	North America	No	42	5	—	—	Left	Transfusion, Conservative
9	69	Central America	No	42	4	1.58	122	Right	Conservative
10	83	Asia	No	14.4	4	5.2	—	Right	Angioembolization
Our case	71	Asia	No	45	4	2.6	173	Right	Conservative
Our case	68	Aisa	No	30	4	2.6	238	Left	Laparotomy Hemostasis

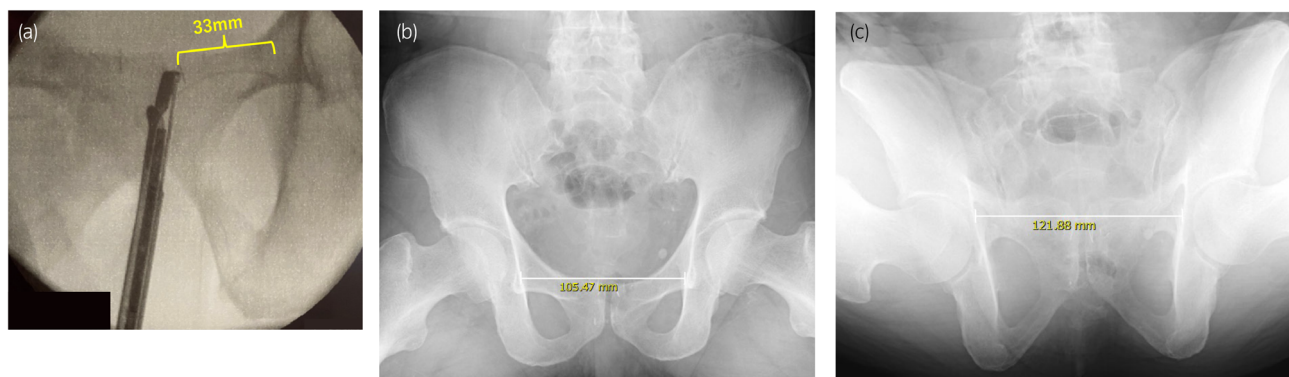


Fig. 2 Pelvic X-ray image of the patients. (a) The delivery device has a needle length of 33 mm and increases the risk of damaging the pubic branches of the obturator artery and vein located at the superior and outer margin of the pubic symphysis. (b) Frontal pelvic radiograph after PUL with the patient in the low lithotomy position. The distance between the arcuate lines at the prostatic proximal urethral level was 105 mm. (c) Frontal pelvic radiograph after PUL with the patient in the high lithotomy position. The distance between the arcuate lines at the prostatic proximal urethral level increased to 122 mm.

The reason is that the needle length of UroLift® is 33 mm so that the tip of the needle can injure the pubic branches of the obturator artery and vein located at the superior and outer margin of the obturator foramen if the device is hardly compressed to the prostate during the first puncture, as shown in Figure 2a. In our case as well, there may have been excessive compression of the prostate by the tip of the device. It is crucial to note that the first puncture in the prostate should be done at a shallow angle of $<5^\circ$, and an additional angle of 10° should be applied during the second puncture for the Japanese BPH patients with the narrow pelvic cavity. Next, we measured the length between the pelvic arcuate lines of the prostate level at the high lithotomy position (Fig. 2c) and compared it with that as the low lithotomy position (Fig. 2b) with the cooperation of the first case patient with pelvic hematoma after PUL; the results showed that the length was 105 mm at the low lithotomy position and 122 mm at the high lithotomy position. In our case, not placing the patient in a high lithotomy position may have contributed to the occurrence of hematoma.

Conclusion

Japanese men have a narrow pelvic cavity, which may contribute to the high occurrence of pelvic hematomas after PUL. Therefore, appropriate compression of the prostate and a high lithotomy position during the PUL procedure could avoid severe complications, such as pelvic hematomas.

Approval of research protocol by an Institutional Review Board

Institutional review board study approval numbers is iwa-byou-372, 33-473 (11100).

Author contributions

Yosuke Fujishima: Conceptualization; data curation; investigation; methodology; project administration; resources; visualization; writing – original draft. Akira Furuta: Conceptualization; methodology; project administration;

resources; supervision; visualization; writing – review and editing. Tatsuya Kawamura: Investigation. Arisa Machida: Investigation. Taro Igarashi: Writing – review and editing. Shigekatsu Maekawa: Writing – review and editing. Renpei Kato: Writing – review and editing. Mitsugu Kanehira: Writing – review and editing. Takahiro Kimura: Supervision. Wataru Obara: Supervision.

Conflict of interest

The authors declare no conflicts of interest.

Informed consent

We obtained consent from the patients for publication.

Registry and the Registration No. of the study/trial

Not applicable.

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