

Scientific Article

UDC 616-006.66

DOI: 10.17816/pmj412130-135

MIGRATION OF HEM-O-LOK CLIPS INTO THE BLADDER AFTER RADICAL PROSTATECTOMY – OWN EXPERIENCE

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МИГРАЦИЯ КЛИПС НЕМ-О-ЛОК В МОЧЕВОЙ ПУЗЫРЬ ПОСЛЕ РАДИКАЛЬНОЙ ПРОСТАТЭКТОМИИ – СОБСТВЕННЫЙ ОПЫТ

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Non-absorbable polymer Hem-o-Lok clips are widely used during nerve-sparing radical prostatectomy for clipping of the neurovascular bundle, as well as for rapid knotless fixation of sutures during the formation of urethrovessical anastomosis. At the same time, cases of migration of Hem-o-Lok clips into the bladder at various times after RP have been described.

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Our retrospective analysis of 1321 patients, who underwent laparoscopic radical prostatectomy at A.M. Granov Russian Scientific Center of Radiology and Surgical Technologies from 2014 to 2023, revealed 3 cases of Hem-o-Lok clip intravesical migration. Also, to search for similar cases of this rare complication a literature review was conducted.

The frequency of postoperative intra-bladder clip migration in our study was 0.23 % (3/1321). One case of spontaneous clip passage was observed 3 months later the radical prostatectomy. In two other cases, long-term symptoms of dysuria (in 7 months and 4 years, respectively) revealed clip incrustation, which led to the removal of the clips through endoscopic intervention and laser cystolithotripsy.

Despite the low incidence of this complication, the use of Hem-o-Lok clips during laparoscopic radical prostatectomy, should be minimized reasonably, particularly during the urethro-vesical anastomosis formation. If lower urinary tract symptoms and/or hematuria occur at any point in the postoperative period, it's advisable to conduct an instrumental examination of the bladder to rule out potential clip migration and possible incrustation.

Keywords. Laparoscopic radical prostatectomy; Hem-o-lok clip migration.

Нерассасывающиеся полимерные клипсы Hem-o-Lok широко применяются в ходе выполнения нервосберегающей радикальной простатэктомии для клипирования сосудисто-нервного пучка, а также для быстрой безузловой фиксации нитей при формировании уретровезикального анастомоза. Вместе с тем описаны случаи миграции клипс Hem-o-Lok в полость мочевого пузыря в различные сроки после радикальной простатэктомии.

Ретроспективный анализ послеоперационного наблюдения 1321 пациента, перенесшего эндовидеохирургическую радикальную простатэктомию в отделении оперативной онкоурологии РНЦРХТ им. акад. А.М. Гранова с 2014 по 2023 г., выявил 3 случая внутрипузырной миграции клипс Hem-o-Lok. Также проведен литературный поиск случаев развития данного редкого осложнения.

Частота встречаемости послеоперационной миграции клипс в мочевой пузырь в нашем исследовании составила 0,23 % (3/1321). В одном случае имело место самостоятельное отхождение клипсы через 3 месяца после радикальной простатэктомии. В двух других осложнение манифестировало в отдаленные сроки (через 7 месяцев и 4 года соответственно) клиникой дизурии на фоне инкрустации клипс, что потребовало эндоскопического вмешательства с лазерной цистолитотрипсией и их удаления.

Несмотря на низкий процент развития данного осложнения, необходимо разумно минимизировать использование клипс Hem-o-Lok в ходе радикальной простатэктомии, особенно при формировании уретровезикального анастомоза. При появлении соответствующих симптомов нижних мочевых путей и/или макрогематурии в любые отдаленные сроки послеоперационного периода целесообразно выполнить инструментальное обследование мочевого пузыря с целью исключения миграции клипсы и ее возможной инкрустации.

Ключевые слова. Эндовидеохирургическая радикальная простатэктомия; миграция клипсы Hem-o-lok.

INTRODUCTION

The first introduced in 1999, Hem-o-Lok clips (Weck Surgical Instruments, Teleflex Medical, Durham, NC, USA) are widely used in various minimally invasive endovideosurgical procedures now [1–6]. In the process of radical prostatectomy (RPE), these non-absorbable polymer clips are used during lateral dissection to clip the neurovascular bundle (NVB) as well as for

rapid knotless thread fixation during con (UVA). Furthermore, the migration of Hem-o-Lok clips into the bladder cavity at various times after RPE has been described. This complication occurs in 1–1.5 % of cases and usually progresses during the first year after surgery [1; 7–9].

The aim of the study is to demonstrate our own results of diagnosis and treatment of cases of Hem-o-Lok clips migration into the bladder cavity after radical prostatectomy.

MATERIALS AND METHODS

1321 endovideosurgical RPEs were conducted at the Department of Operative Oncourology of the „Russian Scientific Center of Radiology and Surgical Technologies named after A.M. Granov“ from 2014 to 2023. During the intervention, Hem-o-Lok clips were used for clipping the vascular pedicles of the prostate gland, for dissection in the SNP area, as well as for fixation of two threads for 12 parts of the conditional dial after UVA formation according to the technique of Van Velthoven et al. [9]. Postoperative follow-up was performed routinely every three months for the first year, then every six months for five years and annually. During the follow-up period, three cases of Hem-o-Lok clips migrating into the bladder cavity were identified¹.

RESULTS

The frequency of this complication in our study is 0.23 % (3 out of 1321). Three months after surgery, the first patient had an independent detachment of the Hem-o-Lok clip during urination without complaints of dysuria or hematuria. The patient underwent endovideosurgical RPE without NVB preservation for localized PC. The Hem-o-Lok clip was used to fixate two V-loc threads on the 12 parts of the conditional dial after UVA formation (Fig. 1). In this case, there was probably a displacement of the clip into the

area of the UVA margins with its subsequent prolapse into the bladder cavity. After re-sorption of the threads, the clip migrated into the bladder cavity and detached on its own during the next urination. Currently, the patient is under dynamic follow-up, fully holds urine, has no complaints of dysuria.

For the second patient, Hem-o-Lok clips were used for lateral dissection during laparoscopic RPE with preservation of the right NVB. In retrospective analysis of the surgery recording, it was found that one of the clips was inappropriately applied and fixed to the NVB tissue only in the area of its lock (Fig. 2). The patient complained to the urologist at the clinic of the place of residence about discomfort and pain during urination and thinning of the urine stream after seven months of surgery. The patient received

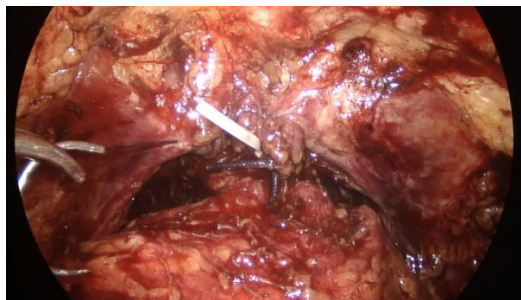


Fig. 1. Hem-o-Lok clip fixing the UVA threads

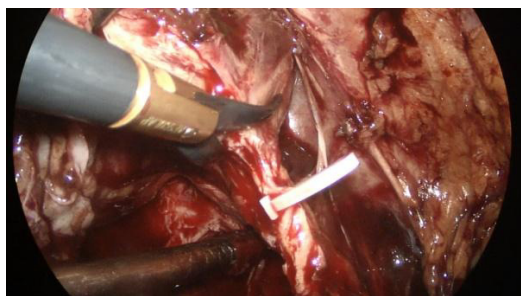


Fig. 2. Inappropriately applied clip Hem-o-Lok clip on the right NVB

¹ All patients' rights were reserved. The study was conducted within the framework of bioethics rules and was retrospective.

conservative anti-inflammatory and antibacterial therapy without positive effect. A single bouginage had no effect. During examination, ultrasound and MRI of the bladder revealed a non-displaced concrection, which was 3 cm in diameter, fixed to the posterior wall of the urinary bladder cervix (Fig. 3). The patient underwent laser cystolithotripsy, urethrocystoscopy. After fragmentation of the stone, a Hem-o-Lok clip was detected with one end immersed in the bladder wall. The clip was clamped and removed using forceps. The postoperative period proceeded without any complications. Complaints of dysuria are completely resolved; the patient can hold urine.

The third patient underwent endovideosurgical RPE with preservation of both NVBs also using Hem-o-Lok clips. The postoperative period was uneventful; the patient holds urine from the first day of catheter removal. There was a gradual deterioration of urination, thinning of the urine stream and occasional impurity of blood in the urine after 4 years and 2 months after surgery. The patient was taking alpha-adrenoblockers and phytopreparations with no significant positive effect. During examination, CT scan of the pelvis revealed an irregularly shaped bladder concrection fixed to its posterior wall with the dimensions of 3×4 cm (Fig. 4). The patient underwent urethrocystoscopy with laser cystolithotripsy. Six Hem-o-Lok clips were detected after stone fragmentation, immersed in the thickness of the posterior wall of the urinary bladder cervix at different depths (Fig. 5). There was performed photovaporization of scar tissues around the

clips with their subsequent removal with forceps. The postoperative period proceeded without complications, the urethral catheter was removed on the fourth day. The complaints of dysuria and hematuria are resolved; the patient holds urine completely.

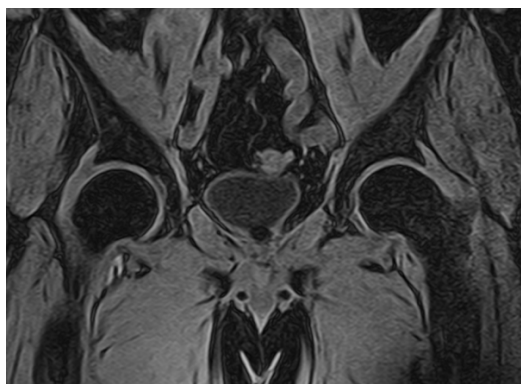


Fig. 3. MR image of a non-displaced concrection, which was 3 cm in diameter, fixed to the posterior wall of the urinary bladder cervix



Fig. 4. CT scan of a concrection bladder



Fig. 5. Removed Hem-o-Lok clips and fragmented concrection

RESULTS AND DISCUSSION

According to the clinical manifestations accompanying the position of the clip in the bladder cavity, Yu et al. distinguish three types of Hem-o-Lok clip migration. The first type occurs when the clip erodes the immediate area of the UVA with the development of obstructive dysuric symptoms to the formation of urinary bladder cervix contracture and urethral stricture. The second type occurs when the clip penetrates into the bladder lumen at a short distance from the UVA and it is accompanied by encrustation and recurrent macrohematuria. At last, the independent detachment of the clip during urination a few weeks after RPE is considered, as the third type of clip migration [8].

The mechanism of clip migration into the bladder cavity and erosion of the bladder wall is not completely clear. The frequency of this complication does not exceed 1–1.5 % of all cases and usually occurs in the first year after surgery [1]. However, single cases of this complication have been described in the literature after 10 and 11 years after RPE [4; 5]. It is often that multiple clips migrate at the same time or it is rarely, that one clip at a time, sequentially over several years [2]. The first and second types of clips are removed endoscopically under vision control with forceps or with laser or transurethral resection [3; 7].

In accordance with the classification of Yu et al. three cases of intravesical migration of clips were identified in our study: there were two patients with the second type and

one patient with the third type. The case of independent clip detachment after RPE occurred at an early time with no complaints of dysuria. In two other cases, the complication occurred in remote terms (in 7 months and 4 years, accordingly) with the clinic of dysuria due to the incrustation of clips, which required endoscopic intervention with laser cystolithotripsy and their removal.

CONCLUSIONS

The use of Hem-o-Lok clips during laparoscopic prostatectomy is connected with the risk of their migration into the bladder lumen. Our experience demonstrates that this complication can occur in different terms of the postoperative period and in the case of fixed clips is accompanied by dysuric symptoms or macrohematuria. It is necessary to carefully observe the surgical technique, minimize the use of Hem-o-Lok clips, especially during UVA formation, and timely intraoperatively remove fallen and improperly applied clips, to prevent clip migration. In case a patient complains of lower urinary tract symptoms and/or macrohematuria at any time after endovideosurgical RPE, radiologic examination of the bladder should be performed to exclude migration of the clip and its possible encrustation.

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Funding. The study had no external funding.

Conflict of interest. The authors declare no conflict of interest.

Author contributions are equivalent.

Received: 01/09/2024

Revised version received: 03/14/2024

Accepted: 03/15/2024

Please cite this article in English as: Bogomolov O.A., Sukhanova T.V., Shkolnik M.I., Kneev A.Yu., Dolbov A.L., Artemov M.V. Migration of Hem-O-Lok clips into the bladder after radical prostatectomy – own experience. *Perm Medical Journal*, 2024, vol. 41, no. 2, pp. 130-135. DOI: 10.17816/pmj412130-135