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A SAFE AND EFFECTIVE METHOD FOR REMOVING ORGANIZED BLOOD HEMATOMA FROM THE BLADDER: THE CLOT MORCELLATION TECHNIQUE

ORGANİZE HEMATOMLARIN MESANEDEN ÇIKARTILMASINDA GÜVENLİ VE ETKİLİ BİR METOT: PIHTI MORSELASYON TEKNİĞİ

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SUMMARY

Introduction: *Urinary retention caused by bladder clots can be an extremely challenging medical condition when these blood clots are difficult to remove. We established an alternative technique to evacuate blood clots from the bladder by using morcellator devices following endoscopic urologic operations when all other conventional methods failed.*

Material and Method: *The clot morcellation technique (CMT) used to treat 12 male patients who had severe clot retention and failed with conventional techniques following TUR-P, TUR-B, or laser prostatectomy. We describe how to use the morcellator to manage bladder blood clots and discuss this novel technique's outcomes.*

Results: *We successfully used this technique to remove a large quantity of hematoma and empty the bladder in all patients with clot retention. The median time of clot removal was 6.9±4.4 minutes. The median estimated volume of hematomas was 80mL (range 20-400). There were no preoperative or postoperative complications.*

Conclusion: *The evacuation of clotted blood in the bladder can be complicated and operational interventions need to be applied. However, having a clot-free bladder at the end of the procedure can be time-consuming and may not always be guaranteed. When other traditional treatments fail to completely remove the blood clot, the CMT is a rapid, easy, safe, and effective method to remove the blood clot entirely*

ÖZ

Giriş: *Mesanede gelişen hematomun neden olduğu üriner retansiyon, kan pıhtılarının çıkarılması zor olduğu durumlarda son derece yönetimi zor bir tıbbi durumdur. Mesanede endoskopik ürolojik operasyonları takiben gelişen organize hematomu boşaltmak için geleneksel metotların işe yaramadığı noktada alternatif bir yöntem olarak Pıhtı Morselasyon Tekniğini(CMT) ortaya koyduk.*

Gereç ve Yöntem: *TUR-P, TUR-B veya lazer prostatektomiyi takiben ciddi pıhtı retansiyonu gelişen, geleneksel metodlar kullanılarak tedavi edilemeyen 12 farklı erkek hastada pıhtılar morselatör kullanılarak temizlenmiştir. Morselatörün mesanede oluşmuş kan pıhtılarını temizlemek için nasıl kullanılacağını tanımladık ve bu yeni tekniğin sonuçlarını paylaştık.*

Bulgular: *Pıhtı retansiyonu olan tüm hastalarda büyük miktarda hematomu çıkarmak ve mesaneyi boşaltmak için bu tekniği başarıyla kullandık. Ortalama pıhtı uzaklaştırma süresi 6.9±4.4 dakika idi. Medyan tahmini hematom hacmi 80 mL'dir (20-400 aralığı). Ameliyat öncesi ve sonrası herhangi bir komplikasyon oluşmadı.*

Sonuç: *Mesanede organize hematomun boşaltılması zorlayıcı olabilir ve cerrahi tedavi gerektirebilir. Buna rağmen işlem sonunda pıhtının tamamının çıkarılması çok zaman alabilir ve her zaman tam bir hematom temizliği garanti edilemeyebilir. CMT, diğer geleneksel yöntemlerin başarısız olduğu noktada mesanede bulunan hematomun tamamının çıkarılmasında hızlı, basit, güvenli ve başarılı bir yöntemdir.*

INTRODUCTION

Hematuria is a general sign of many urological diseases and bleeding is a common complication of Urological endoscopic surgeries of the prostate and bladder (1–4). Persistent bleeding or hematuria could create organized hematoma, which eventually bloke the urinary flow from the bladder. Blood clot formation in the bladder which leads the retention is an emergency in urology practice that presents with severe abdominal pain due to a bladder overdistention.

There are some traditional methods for removing blood clots from the bladder. Manual irrigation with syringe by inserting a Foley catheter or evacuation with the help of additional devices accompanied by cystoscopy are the classical management. In many cases, these conventional methods are sufficient for a clot-free bladder, but occasionally these methods may not be always successful when the hematoma is large and organized (5,6). Open surgery is still the last option if conventional or minimally invasive treatments are unsuccessful. To prevent patients from unnecessary operations novel methods are described in the literature (7,8). An early study demonstrated that tissue plasminogen activator (t-PA/Alteplase) reduced clot evacuation time and provide complete evacuation using less solution (7). Additionally, a novel paper that used hydrogen peroxide solution for irrigation showed that hydrogen peroxide promotes clot distribution without any complication (8). However, current evidence is still insufficient for these methods in the literature.

The morcellator is an instrument for chopping into small fragments a part or all of a solid body organ, usually diseased, that has just been resected in surgical intervention. Modern instruments provide crushing and extracting to the outside through the association with a suction mechanism to evacuate to the outside to facilitate its extraction through an incision or access. It is used above all in gynecological, thoracic, and urological laparoscopy, and to name the fragmentation and extraction of hyperplastic nodules of the prostate after being enucleated with different energy devices (9). A case series showed that morcellators could be used for blot clot evacuation after laser prostate surgery for benign prostatic hyperplasia (10).

In this article, we introduce a safe and effective technique called "the clot morcellation technique" (CMT) to evacuate organized blood clots from the bladder in such difficult cases by using a prostate morcellator.

MATERIAL AND METHODS

After local ethics committee approval was obtained (B.30.2.İEÜSB.0.05.05-20-181), we retrospectively collected data from patients who had clot retention and were treated using the CMT between 2018 and 2021. All patients had signed informed constantly. Patients' demographic, perioperative and postoperative data were recorded. Urinary ultrasonography was performed on all patients before the surgery. A total of 12 male patients who underwent minimal invasive prostatectomy or transurethral resection of the bladder and gross hematuria after surgery were included in the study. The patients who had symptoms of urinary retention were irrigated by Foley catheter and did not resolve was underwent cystoscopy and CMT.

The Clot Morcellation Technique

All were placed in the dorsal lithotomy position under spinal anesthesia. A 24-fr resectoscope with a 30-degree lens was introduced into the bladder. Before evacuating clots from the bladder, any bleeding inside the bladder or prostatic fossa was stopped with bipolar coagulation. We think this step is vital for the

subsequent phases because a clear vision is essential for safe morcellation. The procedure was continued with the same sheath, a 24 Fr nephroscope inserted into the bladder, and the morcellator (Hawk JAWS) was used with two irrigation pumps to provide a clear vision. The table arrangement was the same as the standard HOLEP - THULEP setup, except for the Laser source and the fibers. (Figure 1). The morcellator device was used to suck out the rest of the little clots, and morcellation was used to clear tenacious and large hematomas until the bladder was emptied. (Figure 2) After the final hemorrhage control and complete clot clearance, irrigation was continued for a while with a 3-way Foley catheter. The catheter was removed if no bleeding was not observed, and the patients were discharged after all patients were capable of urination without any obstructive symptoms.

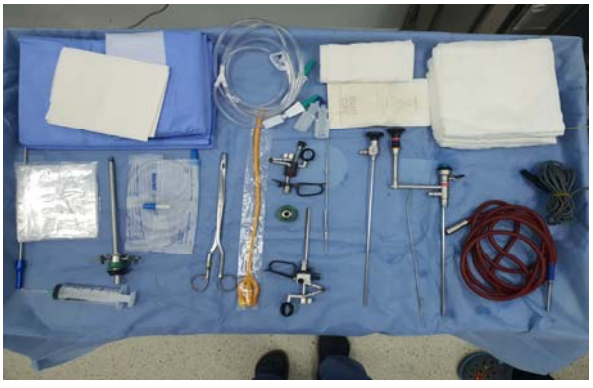

Figure 1. The Clot Morselation setup includes resectoscope for coagulation and nephroscope for morcelation

Figure 2. Organised hematom suction and morcelation

RESULTS

The mean age was 67.9 ± 12.8 years. The etiology of the blood clot retention was due to endoscopic surgeries; 5 patients had prior transurethral resection of the prostate (TUR-P), four patients had prior transurethral resection of the bladder (TUR-B), two patients had a prior holmium laser enucleation of the prostate (HOLEP), and one patient had a prior thulium laser enucleation of the prostate (THULEP) respectively.

The mean clot volume was 80 ml (20-400). Hemostasis was achieved with bipolar coagulation. Table 1 shows patients' demographic and perioperative data. The mean operation time was 37 ±17.1 min. and no complication was observed. The patients' catheters were removed in an average of 2 days (1-4).

Table 1. Demographic parameters of patients

Parameters	value
Age (year) mean (±SD)	67.9 (12.8)
Endoscopic Surgery type [n and (%)]	
-TURP	5 (41.8%)
-HOLEP	2 (16.6%)
-THULEP	1 (8.3%)
-TURB	4 (33.3%)
Morcellator time (min.) mean (±SD)	6.9 (4.4)
Procedure time (min.) mean (±SD)	34.7 (17.1)
Evacuation blood clot volume (mL) median and range(mL) *	80 (20-400)
Complications [n and (%)]	none
Catheter removal (day) mean (±SD)	2 (1-4)

Mean (±SD) data was expressed as mean and standard derivation(SD)
n and (%) data was expressed as count and percentile
* data was expressed as median and range

DISCUSSION

The evacuation of clotted blood in the bladder can be complicated and sometimes quite difficult to successfully remove large-organized clots in the bladder. Our study demonstrates that the clot morcellation technique could be used after various surgeries including transurethral resection of the bladder.

The first step for bladder washout is irrigating the bladder with a foley catheter (8). However, this management depends on many factors such as size and type of catheter, and clot formation. If this step fails, the patient underwent cystoscopy under general anesthesia and the Ellik evacuator and Toomey syringe may not be sufficient to remove organized clots from the bladder because they cannot produce enough suction power. Therefore, many practitioners and urologists come up with different methods like the "Suction and Fishing Method" or "Mechanical suction method," which can create more negative pressure generated by wall suction and other sources. However, there is a risk of perforation because the procedure is performed without visualization and this is an important drawback of these techniques (5,6). Aydın et. al study showed another method using a thoracic catheter for removing clot retention. The authors commented that this technique was a simple and effective method but also added that this technique is a blind technique and has disadvantages such as the risk of bladder injury (11). The urologist tried another method for preventing additive invasive treatment the installation of chemicals such as hydrogen peroxide, streptokinase, and alteplase to remove the clot by a chemical breakdown (7,8). The most significant drawbacks of this method are insufficient lysis of blood clots and poor vision caused by microbubbles after installation. But studies also commented that the availability and the expense of these chemicals are other issues to consider. Our study demonstrated that MCT performed under a good visualization with sufficient irrigation fluid circulation.

As a BPH treatment, HOLEP and THULEP laser prostatectomy and morcellation usage have increased considerably in recent years. Morcellator devices of different brands became widespread in most urology clinics worldwide. When conventional methods fail, the CMT seems to be very effective against sufficiently organized blood clots. A novel study showed that CMT is a safe and effective method however the authors commented that this technique did not sufficient for bleeding after bladder tumors or undiagnosed etiology (10). The process of suction and morcellation of the blood clots is swift and efficient under direct vision with the morcellator. However, a clear site of view must be obtained to prevent unintentional injuries to the bladder. Therefore, proper hemostasis and dual irrigation are the most substantial steps in performing the procedure. We have not encountered any morcellator-related complications and treated all the patients successfully. Controversially, our study suggested that CMT is also an effective method for clot removal in patients with bladder tumors. The CMT can be preferred for treating clot retention after endoscopic urologic operations and is presumably superior to traditional methods. Good visualization and careful morcellation are the key points of success. The small patient group and lack of a control group are the limitations of this study. A larger randomized group trial across multicenter is warranted.

CONCLUSION

The CMT is a safe, fast, and effective method and can be preferred for treating clot retention after endoscopic urologic operations and is presumably superior to traditional methods.

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