

Embolization in Haemorrhage-associated Transurethral Resection of Prostate: An Advancement of Endovascular Technique

Transüretral Prostat Rezeksiyonuyla İlişkili Kanamada Embolizasyon: Endovasküler Teknikte İlerleme

Firdaus HAYATI¹, Zainal Adwin Zainal ABIDIN², Fairrul KADIR³, Nik Azuan Nik ISMAIL⁴, Tan Guan HEE⁵

ABSTRACT

Benign prostatic hyperplasia is common in the elderly. The surgery of choice in those who failed medical treatment is transurethral resection of the prostate (TURP). Post-TURP haematuria can be distressing and difficult to manage. The physiological changes in the elderly have led to inability to withhold hypovolaemic states especially in inoperable patients. Using endovascular modalities, this complication can be managed efficiently without endangering patients' well-being. Herein, we present a case of a successful prostatic artery embolization in a patient with a post-TURP hemorrhagic complication ineligible for surgery.

Key words: Benign prostatic hyperplasia, lower urinary tract symptoms, transurethral resection of prostate, bleeding post TURP, prostatic artery embolization

ÖZ

Benign Prostat Hipertrofisi yaşlılarda sık görülür. Medikal tedaviden yarar görmeyenler için cerrahi seçimi prostatın transüretral rezeksiyonudur (TURP). TURP sonrası hematüri sıkıntılı ve baş etmesi zor bir durumdur. Yaşlılardaki fizyolojik değişiklik, özellikle inoperable hastalarda hipovolemik durumun engellenmesinde yetersizliğe neden olmaktadır. Endovasküler teknikler kullanılarak hastaların genel durumunu bozmadan bu komplikasyon etkili bir şekilde yönetilebilir. Burada, TURP sonrası kanama komplikasyonu olan ve cerrahi uygunluğu olmayan bir hastanın başarılı prostatik arter embolizasyonunu vaka olarak sunduk

Anahtar kelimeler: Benign prostat hipertrofisi, alt üriner kanal semptomları, Transüretral rezeksiyon, rezeksiyon sonrası kanama, prostat arter embolisi

INTRODUCTION

Benign prostatic hyperplasia (BPH) has a high prevalence rate of over 50% in men aged more than 60 years¹. It is often associated with lower urinary tract symptoms (LUTS) namely urgency, nocturia, weak urinary stream, hesitancy and occasionally sexual dissatisfaction. However, if haematuria presents in BPH patients post transurethral resection of prostate (TURP), it can be distressing and difficult to manage. This complication happened in 12% of the population². In view of the physiological changes in the

elderly, this condition has complicated those with hypovolaemic states especially in inoperable candidates. Hence, minimally invasive technique is the best option modality for them.

We successfully managed a surgically poor fitness patient, who had persistently recurrent bleeding from the prostate after TURP by using endovascular intervention. This case explains its typical presentation and illustrates a successful endovascular technique in its involved vasculature for this group of patients.

Received: 19.02.2017

Accepted: 19.03.2017

¹Department of Surgery, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Sabah, Malaysia

²Department of General Surgery, Surgical Sciences Cluster, Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia

³Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Sabah, Malaysia

⁴Interventional Radiology Unit, Department of Radiology, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

⁵Urology Unit, Department of Surgery, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

Yazışma adresi: Firdaus Hayati, Department of Surgery, Faculty of Medicine and Health Science, Universiti Malaysia Sabah, Sabah, Malaysia

e-mail: firdaushayati@gmail.com

CASE PRESENTATION

This is a 73-year-old gentleman with previous history of TURP for BPH in 2007, started to develop recurrent LUTS postoperatively. He was diagnosed with severe mitral and tricuspid regurgitation in 2010 requiring lifelong anti-coagulants. He was admitted several times for recurrent acute urinary retention and painless hematuria since then but was managed conservatively due to the valvular heart diseases. He presented again with severe haematuria requiring massive blood transfusion. Flexible cystourethroscopy revealed absence of active bleeding precluding him from any form of cystoscopic intervention. He was started on dual therapy namely alpha-adrenergic blocker (tamsulosin) and 5-alpha reductase inhibitor (dutasteride). Routine bladder irrigation was started but haematuria persisted.

With ejection fraction of 40%, endovascular intervention was decided instead of open surgery. This modality was decided aiming to reduce the prostate size and additionally to arrest the haemorrhage. CT angiogram revealed the main arterial supply was from prostatic branches of inferior vesical arteries but still no extravasation of contrast seen. The

prostate was enlarged measuring 5.0 x 6.5 x 4.0 cm. Baseline MRI was performed pre-embolization as a standard protocol. From the MRI, the prostate gland was heterogenous hypertrophic without features of malignancy.

During prostatic artery embolization, the right common femoral artery was chosen as the access. The iliac arteries were tortuous but managed to navigate to branches of prostate arteries bilaterally. Upon cannulation, polyvinyl alcohol (PVA) of 180-300 microns was injected slowly under fluoroscopic guidance. Post-embolization runs showed significant reduction in perfusion to the prostate from both prostate arteries (Figure 1 and 2).

The recovery period was excellent as no postoperative complication occurred. Repeat cystoscopy after a week demonstrated a moderately enlarged prostate without active bleeding. Trial of voiding was successful after 2 weeks. He was followed up until 2 years whereby he denied further symptoms. He had no more admission since then. Latest ultrasound of the prostate revealed it was mildly enlarged, the volume size measured 3.4 x 5.1 x 3.9 cm, showing a significant reduction compared to previous imaging (Figure 3).

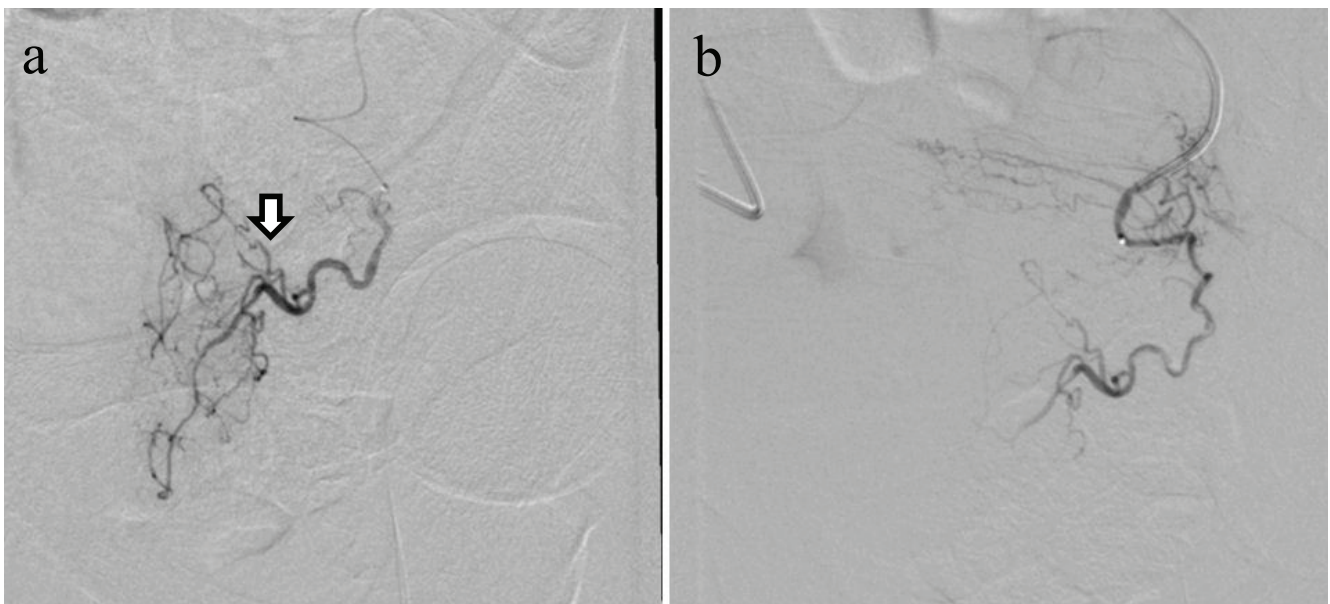


Figure 1. This angiographic pictures showing pre (a) and post (b) embolization of left prostate artery whereby marked reduction of angiographic activity seen after embolization in branches of prostatic artery (arrow).

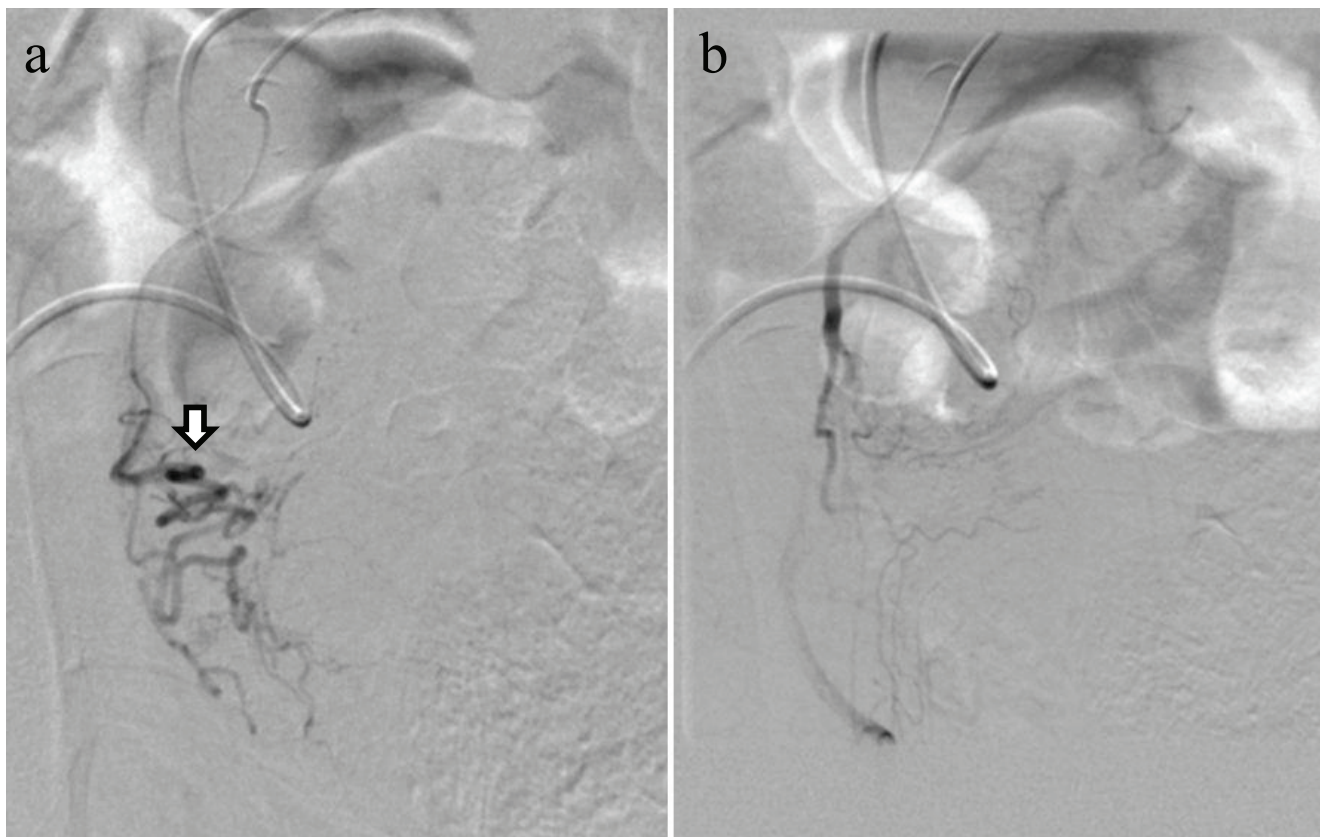


Figure 2. Poly-vinyl alcohol was used pre (a) and post (b) embolization of right prostate artery, showing marked reduction of angiographic activity of branches of prostatic artery (arrow).

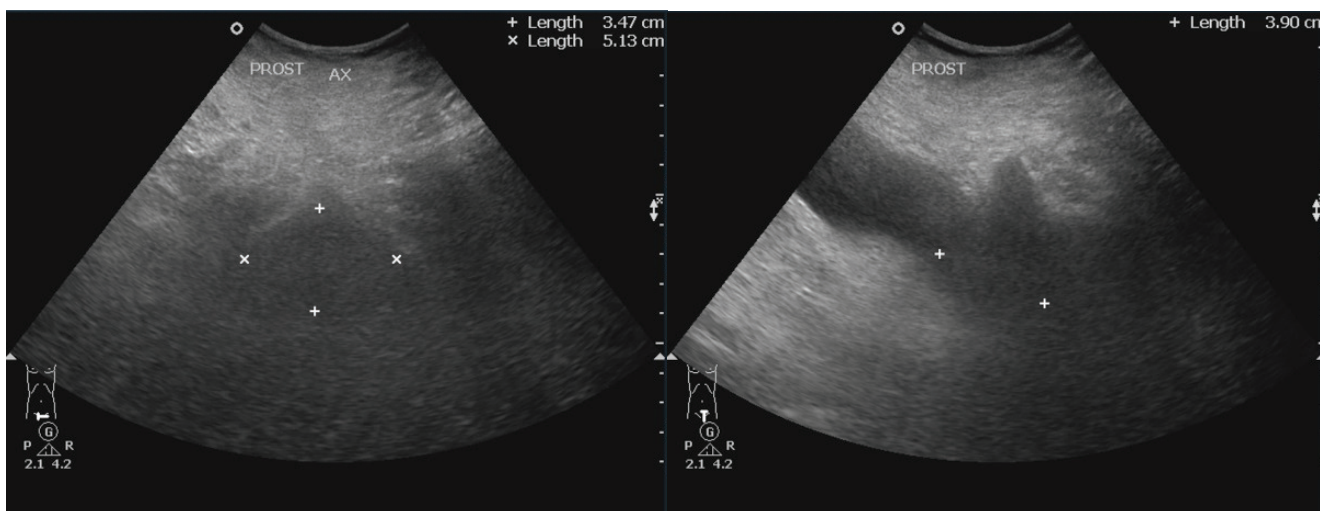


Figure 3. Ultrasound of the prostate showing reduction in the prostate size.

DISCUSSION

Haemorrhage of prostatic origin in patients with BPH is usually treated with non-invasive methods. Speci-

fic treatments involve limitation of physical activity, anti-fibrinolytic agents and fulguration of the bleeding points endoscopically³. If these fail, more radical routes need to be addressed. Prostatectomy by open

surgery or by conventional TURP is still considered the gold standard for treatment⁴. Nevertheless, surgery alone is without its own complications. Urinary tract infection, strictures, incontinence, haemorrhage and sexual dysfunction are among the obstacles. Severe heart disease is a well-known contraindication for general anaesthesia, hence the need for minimally invasive techniques surfaces. Advancements in technology has brought upon newer alternatives for treatment. Some of these minimally invasive alternatives include bipolar TURP, diode laser, holmium laser, holmium laser enucleation, and transurethral vaporization of the prostate (TUVP)⁵. TUVP has advantages especially in high-risk groups, including those with cardiac pacemakers, bleeding disorders, or under anticoagulant therapy⁵.

Traditionally, arterial embolization has been utilized in the treatment of symptomatic uterine leiomyomas and intractable haemorrhage in advanced pelvic malignancies, both produce good long term outcome^{6,7}. Hence, embolization is an option for treatment in prostatic bleeding. An animal study on pigs was performed and it has proven to be safe⁸. A reduction in prostate volume has been shown after vascular embolization without any sexual dysfunction. It is also able to control massive bleeding after prostatectomy or prostate biopsy⁹. No reported cases have been shown in the literature to describe this alternative method in treating recurrent bleeding BPH post TURP.

In embolization, non-spherical poly-vinyl alcohol (PVA) has been used for several years as the particle of choice. It promotes permanent vascular occlusion through mechanical obstruction and foreign body inflammatory reaction. Even it is relatively inexpensive, easy to use and cost-effective, there are data suggesting that PVA particles have certain undesirable features. The irregular shape of PVA particles tend to aggregate leading to risk of clogging the microcatheter and risk of non-targeted embolization, which obstructs the vascular bed at a more proximal level¹⁰.

The blood supply to the prostate is from the anterior

or branch of the internal iliac artery, mainly by the inferior vesicle artery, which subsequently branches into the urethral and capsular vessels¹¹. One of the concerns with prostatic artery embolization is risk of bladder wall ischemia and necrosis after inferior vesical artery embolization¹². It is rather complicated in comparison to fibroid vascular embolization as it needs to deal with thin tortuous atherosclerotic vessels, difficulty in visualization, and super-selective catheterization of the inferior vesical artery and prostate arteries. In view of small vessels, sometimes manipulation of the catheter can lead to vasospasm, which further complicates the subsequent process.

CONCLUSION

Prostatic artery embolization is an alternative for treatment of bleeding BPH, other than standard open or endoscopic intervention. It is a harmless, rather sub-specialized procedure with a conspicuously promising result and overall outcome.

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