Journal of Advances in Medicine and Medical Research

29(5): 1-4, 2019; Article no.JAMMR.25591
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

Transarterial Embolization for Renal Hemorrhage after Percutaneous Nephrolithotomy

Mohammed Habib[1*], Mohammed Hillis[1], Majed Shunnat[1] and Mohammed Matar[2]

[1]Department of Cardiology, Al Shifa Hospital, Gaza, Palsetine.
[2]Department of Radiology, Al Shifa Hospital, Gaza, Palestine.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2019/v29i530091
Editor(s):
(1) Dr. Jingli Xu, College of Pharmacy, University of New Mexico, USA.
Reviewers:
(1) Alejandro Rojas-Marroquín, Universidad Nacional Autónoma de México, México.
(2) Raza Sayani, Aga Khan University Hospital, Pakistan.
(3) Marco Matteo Ciccone, University of Bari, Italy.
(4) Mehmet Taşar, Dr. Sami Ulus Maternity and Children Hospital, Turkey.
Complete Peer review History: http://www.sdiarticle3.com/review-history/25591

Case Study

Received 20 December 2015
Accepted 08 April 2016
Published 05 April 2019

ABSTRACT

Percutaneous nephrolithotripsy (PNL) is a safe and effective treatment modality for the management of renal stones. This technique is associated with high success rates and few complications. The most important complication is hemorrhage. Delayed hemorrhage following PNL is rare complication and usually occurs due to development of the pseudoaneurysm or Arteriovenous fistula which can be successfully managed with arterial embolization. Here we are reporting a case of delayed post-PNL bleeding that occurred in a 41-year-old male operated on for renal stone. Multi Detector Computed Tomography scan revealed a presence of the pseudoaneurysm and Arteriovenous fistula in the inferior segmental branch of the left renal artery, which was successfully managed with amplatzer vascular plug.

Keywords: Arterial embolization; bleeding; percutaneous nephrolithotomy.

**Corresponding author: E-mail: cardiomohammad@yahoo.com;*

1. INTRODUCTION

Percutaneous intervention for the renal collecting system was first described in the 1950 s, but it wasn't until the mid-1970 s that percutaneous access to the renal collecting system was routinely utilized for the removal of nephrolithiasis [1,2].

PNL is currently an effective therapeutic method. The rate of successful treatment in renal calculi about 95%, however, the rate of minor and major complications is as high as 83% [3]. The most common complication is hemorrhage (5.8%). Hemorrhage due to PNL may be either venous or arterial. Arterial complications are classified as arteriovenous fistula, arteriocalyceal fistula, pseudoaneurysm, or perinephric hematoma [4].

Percutaneous nephrolithotomy (PNL) is considered the standard treatment for staghorn and large-volume renal calculi, as well as upper tract calculi refractory to other modalities, difficult lower pole stones, cystine nephrolithiasis, and calculi in anatomically abnormal kidneys. PNL is typically a very safe and well-tolerated procedure, but as with any surgical intervention, PNL is associated with a specific set of complications [5,6].

Arteriovenous fistula (AVF) and pseudoaneurysm are the most serious reason of renal hemorrhages after PNL. Delayed bleeding from an AVF or a ruptured pseudoaneurysm occurs in less than 1% of patients undergoing PNL [7].

Renal angiography and embolization play an important role in the early diagnosis and treatment of significant post-PNL hemorrhage.

2. CASE REPORT

A 41-year-old male patient was referred to the urology service in our hospital because of macroscopic hematuria. The patient underwent percutaneous nephrolithotomy at Military hospital before 1 week.

The patient was noted to have a slowly falling hematocrit on postoperative days due to macroscopic hematuria which need further evaluation with a multi detector computed tomography (MDCT) scan. The arterial phase of angiography suggested early filling left renal vein with renal artery, indicating an arteriovenous fistula and a pseudoaneurysm (Figs. 1, 2).

Fig. 1. Multi Detector Computed Tomography (MDCT) scan. The arterial phase of angiography suggested early filling left renal vein with renal artery, indicating an arteriovenous fistula

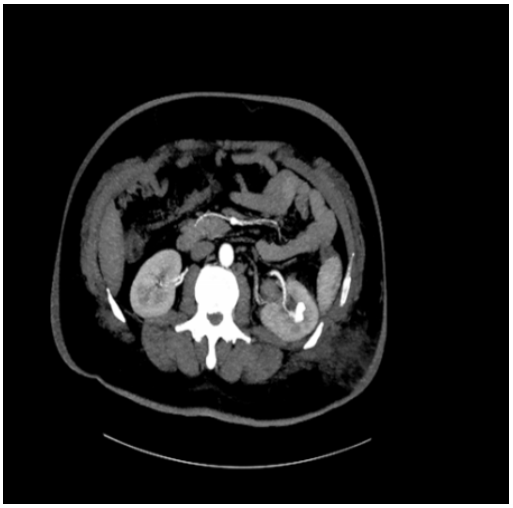

Fig. 2. Multi Detector Computed Tomography (MDCT) scan. The arterial phase of angiography suggested early filling left renal vein with renal artery, indicating an arteriovenous fistula and a pseudoaneurysm

Transfemoral arteriography was performed under local anesthesia. After obtaining a vascular access by placing a 6 French sheath, selective catheterization and angiography of the left renal artery using 6 French Renal Double Curve (Boston Scientific, RDC) catheter was performed. Interlobar arteries causing bleedingwas detected. Selective left renal artery injection during the arterial phase showing a pseudoaneurysm and an AVF arising from the inferior interlobar artery.

The feeding artery was embolized using amplatzer vascular plug II, 9 mm (Boston Scientific) to occlude flow into the arterial lesion. Control angiogram after vascular plug II embolization showing complete obliteration of the pseudoaneurysm and AVF (Figs. 3,4).

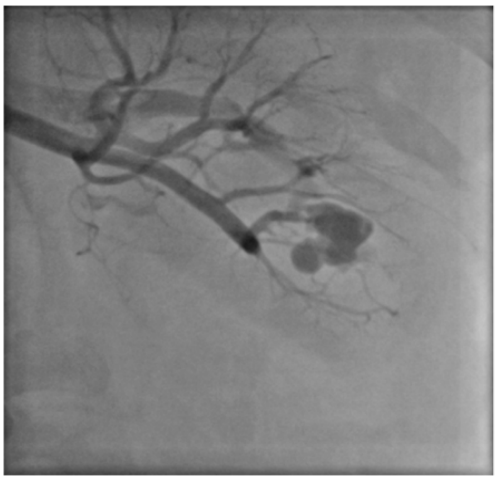

Fig. 3. Left renal artery injection during the arterial phase showing a pseudoaneurysm and an AVF arising from the inferior interlobar artery

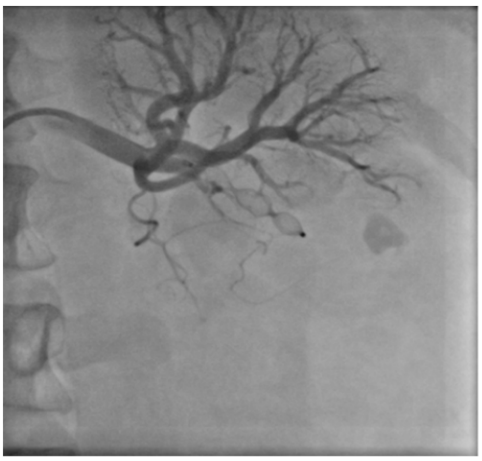

Fig. 4. Control angiogram after vascular plug II embolization showing complete obliteration of the pseudoaneurysm and AVF

3. DISCUSSION

Recently, a survey of urologists in Europe revealed that percutaneous procedures are performed by 69.6% of the respondents with a mean of 16.8 PNL procedures a month [8]. PNL is generally a safe treatment option and associated with a low but specific complication rate [6].

Hemorrhage is most common complication after PNL. The renal hemorrhage requiring angiographic intervention about 0.3% [9].

The angiographic intervention were performed using different sclerotic agents such as N-butyl-2-cyanoacrylate, Onyx ,gel foam particles, polyvinyl alcohol (PVA), embospheres, detachable balloons, and coils [10-12]. The major limitations of arterial embolization with N-butyl-2-cyanoacrylate ,Onyx, gel foam, PVA, and embospheres include the reflux of the embolic agent to the normal artery ,which leads to unwanted regional embolization passing to the venous system from AVF, which leads to pulmonary embolism.

Richstone et al. [7] reported that 57 out of 4695 patients (1.2%) required selective endovascular embolization following percutaneous renal interventions (PNL was the etiology for 44 of 57 patients). Srivastava et al. [13] reported embolization after PNL in 24 out of 1854 patients and found a combination of PA and AVF in four cases.

Serkan et al. [14] reported that, between March 2003 and December 2013, A total of 55 patients with iatrogenic renal arterial lesions, who underwent endovascular embolization were included , in this series 26 patients underwent embolization after PNL, and a combination of PA and AVF was present in five of these 26.

In our case the patient had high-flow fistulae and psedoaneurysm in lower lob on the left renal after PNL. Because of migration risk, we prefer to use Amplatzer vascular plug that permitted endovascular treatment in a more controlled manner than coils. To best of our knowledge this is the first case was reported to use vascular plug II with complete obliteration of the pseudoaneurysm and AVF after PNL.

4. CONCLUSIONS

In conclusion, renal iatrogenic arterial lesions after PNL lesions should be considered in patients with macroscopic hematuria or flank pain following PNL. CT angiography are usually performed for diagnosis of these lesions. Transarterial embolization can be safely and effectively procedure with high rate of success and immediate benefits.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Hiatt RA, Dales LG, Friedman GD, et al. Frequency of urolithiasis in a prepaid medical care program. Am J Epidemiol 1982;115:255-65.
2. Ogg CS, Saxton HM, Cameron JS. Percutaneous needle nephrostomy. Br Med J. 1969;4:657-60.
3. Michel MS, Trojan L, Rassweiler JJ. Complications in percutaneous nephrolithotomy. Eur Urol. 2007;51(4): 899–906.
4. Maleux G, Messiaen T, Stockx L, Vanrenterghem Y, Wilms G. Transcatheter embolization of biopsy-related vascular injuries in renal allografts. Long-term technical, clinical and biochemical results. Acta Radiol. 2003;44(1):13–7.
5. Preminger GM, Assimos DG, Lingeman JE, et al. Chapter 1: AUA guideline on management of staghorn calculi: Diagnosis and treatment recommendations. J Urol. 2005;173:1991-2000.
6. Rudnick DM, Stoller ML. Complications of percutaneous nephrostolithotomy. Can J Urol. 1999;6:872-875.
7. Richstone L, Reggio E, Ost MC, et al. Hemorrhage following percutaneous renal surgery :Characterization of angiographic findings. Endourol. 2008;22:1129–1135.
8. Kauer PC, Laguna MP, Alivizatos G, et al. Present practiceand treatment strategies in endourological stone management: results of a survey of the EuropeanSociety of Uro-technology (ESUT). Eur Urol. 2005;48: 182–8.
9. Maurice Stephan Michela, Lutz Trojan, Jens Jochen Rassweiler. Complications in Percutaneous Nephrolithotomy European Urology. 52:2007:899-906.
10. Massulo-Aguiar MF, Campos CM, Rodrigues-Netto N Jr. Intrarenal pseudo-aneurysm after percutaneous nephro-lithotomy. Angiotomographic assessment and endovascular management. Int Braz J Urol. 2006;32:440–4.
11. Cimsit NC, Baltacioglu F, Cengic I, Akpinar IN, Ilker Y, Turkeri L. Transarterial glue embolization in iatrogenic renovascular injuries. Int Urol Nephrol. 2008;40:875–9.
12. Zelenák K, Sopilko I, Svihra J, Kliment J. Successful embolization of a renal artery pseudoaneurysm with arteriovenous fistula and extravasations using Onyx after partial nephrectomy for renal cell carcinoma. Cardiovasc Intervent Radiol. 2009;32:163 –5.
13. Srivastava A, Singh KJ, Suri A, et al. Vascular complications after percutaneous nephrolithotomy: Are there any predictive factors? Urology. 2005;66:38–40.
14. Serkan Güneyli, et al. Endovascular management of iatrogenic renal arterial lesions and clinical outcomes. Diagn Interv Radiol. 2015;21:229–234.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle3.com/review-history/25591