

Bilateral transrenal ureteral occlusion by means of *n*-butyl cyanoacrylate and AMPLATZER vascular plug

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Abstract

AMPLATZER vascular plug is a widely used embolic agent. In the present paper, we present a case of an 86-year-old female patient who underwent bilateral ureteral occlusion by means of AMPLATZER vascular plug II coupled to *n*-butyl cyanoacrylate (NBCA) because of recurring pyelonephritis following cystectomy with subsequent bilateral ureterosigmoidostomy (sec. Mainz type II).

Key words: Antegrade pyelography; nephrostomic tube; ureteral occlusion

Introduction

Emergent clinical situations such as ureteral leaks may require transient or permanent urinary flow diversion. In order to achieve such a goal, percutaneous nephrostomic tubes and/or ureteral stents are commonly placed even though other frequent techniques such as ureter occlusion by means of balloons or coils^[1] are available.

We describe bilateral ureteral occlusion by means of AMPLATZER vascular plug II (AVP; AGA Medical, Golden Valley, MN, USA) coupled to *n*-butyl cyanoacrylate (NBCA) glue (Glubran2; GEM, Viareggio, Italy) in an 86-year-old female with recurring pyelonephritis following cystectomy with subsequent bilateral ureterosigmoidostomy (sec. Mainz type II). This clinical situation seems to be rare; in fact, to the best of our knowledge, only one other similar case has been reported.^[2]

Case Report

In February 2012, an 86-year-old female was diagnosed with bladder cancer extending to the urethra. Accordingly, the surgeon decided to perform a radical cystectomy followed by bilateral ureterosigmoidostomy (sec. Mainz type II).

The post-surgical period was complicated by recurring pyelonephritis and rectal incontinence. A multidisciplinary team of urologists, oncologists, and interventional radiologists came up with two possible alternatives. The first one was a new surgical approach in order to create a definite bilateral ureter-ileocutaneous anastomosis; the second one consisted of a percutaneous bilateral occlusion of both the ureters, coupled to bilateral permanent nephrostomic tube placement. As the patient refused to undergo surgery, the second alternative was performed.

Under USG-guidance, an inferior calyx of the kidney was punctured bilaterally by means of an Accustick introducer system (Boston Scientific, Natick, MA, USA). The procedure was then carried out under fluoroscopic guidance. A 6-Fr sheath (Terumo, Tokyo, Japan) was placed on a 0.035 stiff guidewire (Amplatz Super Stiff; Boston Scientific, USA) bilaterally. Antegrade pyelography was performed in order to exactly recognize both ureterosigmoidostomies. A 10 × 7 mm AMPLATZER vascular plug II was deployed bilaterally

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DOI:
10.4103/0971-3026.134390

in the ureters, proximal to the anastomosis. Then, a 2.7-Fr microcatheter (Terumo, Japan) was bilaterally introduced through the sheath and the tip advanced into the AMPLATZER mesh. The microcatheter was subsequently flushed with 5% glucose saline before injecting 1.5 ml of NBCA mixed with ethiodized oil (Lipiodol UF; Guebert, Aulnay-sous-Bois, France) in a 1:1 ratio with subsequent immediate removal of the microcatheter. A slight caudal migration of NBCA was noticed on the left side, without any significant drawback. An 8-Fr nephrostomic tube (Boston Scientific, USA) was placed bilaterally in order to drain the urinary flow. Following the procedure, trans-nephrostomic bilateral antegrade pyelography showed immediate and complete ureteral occlusion on both sides [Figure 1]. The patient was discharged the following day. A week following the procedure, the patient underwent a new trans-nephrostomic bilateral antegrade pyelography confirming the complete occlusion of both ureters.

Discussion

Permanent transrenal ureteral occlusion with consequent urinary diversion is usually required in cases of ureteral leaks, due to iatrogenic events during pelvic surgery or as a consequence of pelvic malignancies, especially if advanced.^[1] Other indications include treatment of intractable cystitis or incontinence.^[3]

We presented a case of an elderly female patient who underwent cystectomy (sec. Mainz type II) due to an advanced bladder cancer invading the urethra.

Several different alternatives have been described in order to obtain permanent ureteral occlusion. Such techniques include placement of Gianturco coils (with or without Gelfoam pledget), percutaneous clips, balloons (non-detachable and detachable), electrocautery, tissue adhesive, and silicone occluding devices.^[1,3,4]



Figure 1: Bilateral antegrade trans-nephrostomic pyelography showing two AMPLATZER Vascular Plug II (arrows) filled with NBCA and placed proximal to ureterosigmoidostomies

We decided not to use coils, clips, and balloons due to the possibility of distal migration into the recto-sigmoid pouch, thus disrupting the permanent desired occluding effect. We did not use tissue adhesive because of the possibility of dissolution and recanalization.^[1,3-5] We also decided against using electrocautery and silicone occluding devices because we had no experience with them. To the best of our knowledge, there has been only one large study to date proving that silicone-filled detachable balloons are superior to tissue adhesive and coils, even though the main disadvantage of balloons was mainly related to dislocation.^[6]

The AMPLATZER vascular plug is a self-expanding cylindrical vascular occluding device made of nitinol mesh functioning as a support for coagulation once inserted into a system rich in platelets and clotting factors. In fact, its main use is related to the occlusion of cardiac septal defects and, to a lesser extent, in the treatment of other disease-related complications such as bile leaks.^[7,8]

Because the AMPLATZER plug is not watertight and the ureteral lumen lacks in clotting factors and platelets, additional techniques are needed to obtain ureteral lumen occlusion. Schild *et al.*^[4] reported a successful transrenal ureteral occlusion with an AMPLATZER plug inserted into an excised latex cover to treat a vesico-vaginal fistula. Although the technique proved to be immediately effective, we did not use it because of the possible latex migration, which would disrupt the desired long-term ureteral occlusion. Accordingly, we preferred to make the AMPLATZER impermeable by injecting small amounts of NBCA into its mesh. In agreement with Shabrang *et al.*,^[3] we chose NBCA as the embolic material, given its well-known immediate and stable adhesive properties being independent of the clotting cascade.^[9]

In conclusion, we present here a case of successful transrenal ureteral occlusion by using an AMPLATZER vascular plug in combination with NBCA. To the best of our knowledge, since this is the second reported case, further studies are needed in order to validate this new promising technique.

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Cite this article as: Grasso RF, Cazzato RL, Luppi G, Mercurio S, Giurazza F, Vescovo RD, *et al.* Bilateral transrenal ureteral occlusion by means of n-butyl cyanoacrylate and AMPLATZER vascular plug. *Indian J Radiol Imaging* 2014;24:129-31.

Source of Support: Nil, **Conflict of Interest:** None declared.

ADDENDUM

Indian Journal of Radiology and Imaging 2014; Vol 24; Issue 2

Title: fMRI for mapping language networks in neurosurgical cases

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Below acknowledgement has been added

I would like to wholeheartedly acknowledge the neurosurgeons and neurologists of Hinduja Hospital, Mumbai, all my colleagues and staff of our radiology department, with special thanks to Dr Meher Ursekar (radiologist) and Dr Urvashi Shah (neuro-psychologist), without whom the work which we have been doing and this article would not have been possible

- Editor, IJRI