

Role of ultrasound-guided percutaneous antegrade pyelography in malignant obstructive uropathy: A Nigerian experience

Babajide Olawale Balogun, James Idowu Owolabi, Abdulwaid Niran Saliu¹, Michael Akintayo Bankole¹

Departments of Radiology, and ¹Surgery, Lagos State University Teaching Hospital, Ikeja, Nigeria

ABSTRACT

Address for correspondence:

Dr. B. O. Balogun,
Department of Radiology,
Lagos State University College
of Medicine, Ikeja, Nigeria.
P.O.Box17438,
E-mail: babajide_balogun@
yahoo.com

Ultrasound-guided percutaneous nephrostomy of the renal pelvis is a technique that is widely acceptable especially when contrast media is introduced in the procedure of antegrade pyelography. It is a relatively safe procedure that effectively improves renal function in obstructed kidneys. It can be performed in most cases as an alternative to retrograde pyelography. We present our experience and its role in obstructive uropathy due to malignancy.

Key words: Nephrostomy, percutaneous antegrade pyelography, pelvic malignancy, obstructive uropathy, ultrasound guided

INTRODUCTION

Despite recent advancements in surgical techniques, radiotherapy and chemotherapy for treatment of pelvic malignancies, these neoplasias often progress with obstructive uropathy due to local spread or pelvic metastases.¹

This obstruction needs to be removed or the patient's clinical condition will deteriorate with time. The patient may develop uremia, with fluid and electrolytes abnormalities and possibly urinary infection with subsequent death. (Hoe, Tung, & Tan, 1993).

Percutaneous needle puncture of the renal pelvis for antegrade pyelography is a technique that is widely accepted and can be performed in most cases as an alternative to retrograde pyelogram.^{2,3}

The initial blind technique was introduced by Goodwin *et al.*⁴ but was later improved using fluoroscopic guidance. This has been superseded by ultrasound or CT-guided methods.

This report presents our experience with ultrasound guidance method for percutaneous puncture of the renal

pelvis for either antegrade pyelography or percutaneous nephrostomy (PCN) and its role in obstructive uropathy caused by malignancy.

CASE REPORTS

Case 1

A four-year-old male patient presented with progressive left thigh swelling, lower abdominal swelling, both of six months' duration and inability to walk for four weeks prior to presentation.

Left thigh swelling started insidiously and became progressively bigger. It was initially painless but later became painful. There was history of intramuscular injection into the gluteal region, which developed into injection abscess for which child had incision and drainage though with insignificant improvement.

There was associated low grade fever, malaise and weight loss. About four weeks prior to presentation, he could no longer walk probably due to pain because power in both lower limbs was normal. No associated change in bowel habit.

Child had plain radiograph of the thighs that showed soft tissue swelling of the left thigh with no bony abnormality. Abdomino-pelvic ultrasound scan showed heterogeneous lower abdominal mass, more on the left side; bilateral hydronephrosis and relatively normal liver and spleen.

Computerised tomographic (CT) scan of the abdomen and pelvis done at this time revealed a heterogeneous soft tissue pelvic mass with no associated bony lesion. Enlarged

Access this article online

Quick Response Code:



Website:

www.nigeriamedj.com

DOI:

10.4103/0300-1652.160408

and hydronephrotic kidneys were worse on the left than on the right. Normal liver and spleen with no metastases noted.

Tissue biopsy taken from the left thigh revealed “malignant round blue cell tumour most probably an embryonal rhabdomyosarcoma.”

He was admitted following histological diagnosis of embryonal rhabdomyosarcoma for commencement of chemotherapy. However while on admission, he developed acute renal failure secondary to obstructive uropathy. Urinary output started to reduce and he became anuric despite repeated renal challenges. There was generalised oedema and irritability.

Biochemical parameters then were deranged with Sodium of 109.7 mmol/L; HCO₃ of 15.3 mmol/L; urea of 15.3 mmol/L; Creatinine of 583 µmol/L and Uric acid of 818 µmol/L.

The child then had right PCN for urinary diversion and antegrade pyelography. This was done using the standard ‘Seldinger’ technique of needle puncture, guide wire insertion and serial dilatation. It showed markedly dilated right ureter, which terminated abruptly in the pelvis. [Figure 1] No contrast is seen flowing into the urinary bladder.

There was significant clinical and biochemical improvement following right percutaneous urinary diversion; generalised oedema got resolved and there was improvement in urinary output.

Percutaneous urinary diversion was also done for the left kidney, five days later. This significantly improved the biochemical parameters.

The child also had repeated blood transfusion for anaemia and work-up for commencement of chemotherapy.

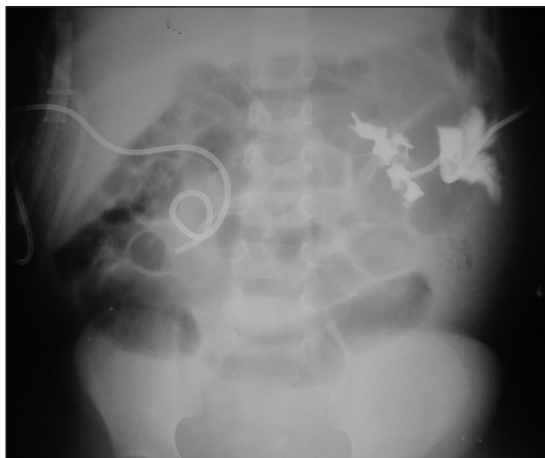


Figure 1: X-ray of the abdomen showing bilateral nephrostomy tubes with contrast introduced into the tube on the left of the patient

Chemotherapy was instituted in a combination dose of Vincristine (1.5 mg/m²), Actinomycin D (1.5 mg/m²) and cyclophosphamide (250 mg/m²).

There was significant reduction in both thigh and abdominal swelling after two courses of cytotoxic therapy. The child resumed passage of urine per-urethra at this time following which drainage through the nephrostomy tubes was stopped.

The child had taken the third course of cytotoxic drugs and there was sustained improvement as at the last clinic follow-up.

Case 2

YS, a 49-year-old widow and trader, who was referred from the surgical outpatient department of Lagos University Teaching Hospital, Idiaraba, Lagos on account of pain in the right knee and in the perineum which is said to increase after micturition. This was two years after having excision of a colorectal carcinoma.

Patient had a past medical history of constipation and abdominal pain of about 1½ years’ duration. She was being managed for advanced colorectal tumour which was confirmed histologically as adenocarcinoma. She had abdomino-perineal excision of the rectum at eight months following presentation. Intra-operative findings were low rectal tumour with synchronous tumour in the distal sigmoid colon, which was adherent to the left ovary. The liver and other abdominal organs were essentially normal. Excision was done with left oophorectomy and a terminal left sigmoid colostomy was fashioned out. She was put on neo-adjuvant chemotherapy and she had five courses.

Radiograph of the knee shows no abnormality. Abdomino-pelvic ultrasound scan showed irregular thickened urinary bladder suggestive of local infiltration and bilateral renal enlargement with bilateral hydronephrosis.

The patient had CT scan of the abdomen and pelvis done which showed delayed excretion on the left kidney with bilateral hydronephrosis. An irregular mass adherent to the urinary bladder was noted. The liver and spleen appear normal.

Two months later, urinary output began to drop and there was persistent biochemical derangement. Potassium was 8.8 mmol/L while Urea was 35.4 mmol/L and Creatinine was 586 µmol/L.

There was anaemia with PCV of 18.8% for which patient had repeated blood transfusion.

She became anuric for about five days after which she developed uremic symptoms of hiccups, occasional vomiting, altered sleep rhythm, anorexia and weakness. This necessitated a salvage haemodialysis. There were

also features of obstructive uropathy with bilateral hydronephrosis, pedal oedema and facial swelling. A right PCN with antegrade pyelography was subsequently requested for and shows severe right pelvi-calyceal dilatation and right hydroureter with abrupt termination of the ureter around the ipsilateral sacro-iliac joint. Contrast did not flow into the urinary bladder [Figure 2].

There was post-obstruction diuresis on the following day with clinical and biochemical improvement.

DISCUSSION

With the advent of high resolution ultrasound machines with better view of the pelvicalyceal systems allowing a success rate almost comparable to that of fluoroscopic guidance. PCN is often the simplest method for the initial management of obstructive renal failure due to the hazards of surgery in ureamic patients.

PCN is a well-established, relatively safe procedure, which effectively improves renal function in obstructed kidneys.^{5,6} The first ultrasound-guided PCN was performed by Pedersen and achieved a success rate of about 70%.⁷

Malignant ureteric obstruction is a recognised event in those with advanced malignancy, usually of pelvic origin, which, if left untreated, is quickly a terminal event.⁸

The issue of decompression of such an obstruction still remains a difficult clinical situation. One needs to be certain whether such drainage will facilitate treatment with chemotherapy or radiotherapy or is it perpetuating and allowing other problems to develop?^{9,10}

In one of our patients, PCN was done mainly to allow chemotherapy to commence. The child resumed passage of urine per-urethra at this time following which drainage through the nephrostomy tubes was discontinued.



Figure 2: X-ray of the abdomen showing contrast outlining the right pelvicalyceal and ureter through the nephrostomy tube

Grabstald and McPhee¹¹ define a “useful quality of life” of minimal pain, few complications, full mental faculties and ability to return home for at least two months to participate in family life. Our second case had haemodialysis done, but could not keep up with the cost of a second episode and was then offered PCN. This allowed the patient to stay alive for another six months with full mental faculties and with the members of her families around.

Patients with uncontrollable pain, low functional status, significant co-morbidities and disseminated disease, with no possibility of treatment are clearly unfavorable candidates for urinary diversion due to poor quality of life.^{12,13} The decision to place a nephrostomy tube lies with the physician, family and above all the patient.¹⁴

The procedure’s main complications include urinary tract infection, obstruction and loss of the nephrostomy catheter.¹⁵ Adjacent organ injuries is another complication, the colon and pleura may be inadvertently injured.¹⁶

Our cases did not experience any complications.

In one of the patients, we did bilateral PCN hoping this will improve urinary output. However, the use of bilateral PCN has been found not to confer any greater benefit of improved renal function when compared with the use of unilateral PCN.¹⁴

We conclude that PCN is effective in improving renal function in malignant ureteric obstruction and will allow chemotherapy to be instituted.

REFERENCES

1. Hoe JW, Tung KH, Tang EC. Re-evaluation of indications for percutaneous nephrostomy and interventional urological procedures in pelvic malignancy. *Br J Urol* 1993;71:467-72.
2. Goodwin WE, Casey WC, Woolf W. Percutaneous trocar (needle) nephrostomy in hydronephrosis. *J Am Med Assoc* 1955;157:891-4.
3. Karim R, Sengupta S, Samanta S, Aich RK, Das U, Deb P. Percutaneous nephrostomy by direct puncture technique: An observational study. *Indian J Nephrol* 2010;20:84-8.
4. Rohatgi M, Bajpai M, Gupta DK, Gupta AK. Role of ultrasound guided percutaneous antegrade pyelography (USCAP) in the diagnosis of obstructive uropathy. *Indian Pediatr* 1992;29:425-31.
5. Keidan RD, Greenberg RE, Hoffman JP, Weese JL. Is percutaneous nephrostomy for hydronephrosis appropriate in patients with advanced cancer? *Am J Surg* 1988;156:206-8.
6. Sood G, Sood A, Jindal A, Verma DK, Dhiman DS. Ultrasound guided percutaneous nephrostomy for obstructive uropathy in benign and malignant disease. *Int Braz J Urol* 2006;32:281-6.
7. Pederson JF. Percutaneous nephrostomy guided by ultrasound. *J Urol* 1974;112:157-9.
8. Romero FR, Broglio M, Pires SR, Roca RF, Guibu IA, Perez MD. Indications for percutaneous nephrostomy in patients with obstructive uropathy due malignant urogenital neoplasm. *Int Braz J Urol* 2005;31:117-24.
9. Wilson JR, Urwin GH, Stower MJ. The role of percutaneous nephrostomy in malignant ureteric obstruction. *Ann R Coll Surg Engl* 2005;87:21-4.

10. Shekarriz B. Outcome of palliative urinary diversion in the treatment of advance malignancies. *Cancer* 1999;85:998-1003.
11. Grabstald H, McPhee M. Nephrostomy and the cancer patient. *Southern Med J* 1973;66:217-20
12. Fallon B, Olney L, Culp DA. Nephrostomy in cancer patients: To do or not to do? *Br J Urol* 1980;52:237-42.
13. Dyer RB, Regan JD, Kavanagh PV, Khatod EG, Chen MY, Zagoria RJ. Percutaneous nephrostomy with extensions of the technique: Step by step. *RadioGraphics* 2002;22:502-25.
14. Chapman ME, Reid JH. Use of percutaneous nephrostomy in malignant ureteric obstruction. *Br J Radiol* 1991;64:318-20.
15. Radeka E, Magnusson A. Complications associated with percutaneous nephrostomies. A retrospective study. *Acta Radiol* 2004;45:184-8.
16. Ramchandani P, Cardella JF, Grassi CJ, Roberts AC, Sacks D, Schwartzberg MS, *et al.* Quality improvement guidelines for percutaneous nephrostomy. *J Vasc Interv Radiol* 2003;14:S277-81.

How to cite this article: Balogun BO, Owolabi JI, Saliu AN, Bankole MA. Role of ultrasound-guided percutaneous antegrade pyelography in malignant obstructive uropathy: A Nigerian experience. *Niger Med J* 2015;56:225-8.

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