

USE OF ANTEGRADE PYELOGRAPHY IN THE INVESTIGATION OF OBSTRUCTIVE UROPATHY: EXPERIENCE IN ZAMBIA.

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Summary

Experience in the use of antegrade pyelography in 14 cases of obstructive uropathy is presented. It is suggested that this method is ideal for investigation of selected cases of obstructive uropathy in areas of endemic urinary bilharziasis. The simplicity and wide margin of safety of this procedure are emphasized.

Introduction

Radiological demonstration of pelvi-calyceal pattern of a kidney by direct injection of contrast medium into the dilated renal system (antegrade pyelography) had been in sporadic use since its first description in 1954 (Wickbom, Weens & Florence). The introduction of delayed high dose urography made visualization of pelvis and calyces possible in most cases of obstructive uropathy. This led to rather infrequent use of antegrade pyelography (AGP). A.G.P., nonetheless, remains a useful method which in an obstructive situation provides much better morphological deliniation of the urinary tract in the shortest possible time. Due probably to endemic prevalence of bilharziasis, one frequently encounters fairly advanced cases of obstructive uropathy in Zambia. High dose urography, in a substantial number of such cases, fails to satisfactorily demonstrate the sites of ureteric strictures. In most of these cases one also fails to undertake retrograde pyelogram due to the presence of vesico-ureteric strictures. AGP thus, would appear to be an ideal form of investigation for such patients. The following account is based on our limited experience in its use in the University Teaching Hospital, Lusaka, Zambia.

Technique

Prior to undertaking this procedure, the patient is prepared as for intravenous urography. If the affected kidney is known to be functioning, its outline is radiologically made visible during this examination by intravenous injection of contrast medium. The patient is placed in the prone position and an area bounded by the corresponding 12th rib, lumbar spines, iliac crest and posterior axillary line is cleaned and draped. An adequate quantity of local anaesthesia (2% Ligno-caine) is injected into an area of skin and deeper tissue, 8cms from the midline and 3cms below the 12th rib. A 14cm lumbar puncture needle is passed vertically downwards through the renal cortex into a dilated calyx. Puncture of the renal pelvis is best avoided as it is prone to tear during respiratory movement of the kidney. The site of puncture may however, be altered depending on the location of the kidney as demonstrated on the preliminary film. About 50mls of urine is aspirated and to prevent overdistension, usually a lesser amount of contrast (65% urografin or conray 250) is injected. Following this, a film is taken with the needle in situ. If there is adequate filming of the pelvi-calyceal system, the needle is removed and further films are taken in the supine, right and left lateral decubitus and erect positions. The aspirated material is routinely sent for culture, whilst at the end of the examination an attempt is always made to aspirate the injected contrast medium.

Materials

The materials include 14 consecutive procedures on 9 males and 5 females. Their ages ranged from 2 days to 50 years (mean age 37

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years). A total of 5 kidneys failed to opacify on delayed urograms and were considered non-functioning; all of which on ultrasound scan, however, were shown to have a dilated pelvi-calyceal system. Prior to antegrade pyelography retrograde catheterization was unsuccessful in 6 cases. The AGP films of a few representative cases eg PUJ obstruction (Fig. 1) multiple ureteric strictures (Fig. 2) nephrocolic fistula (Fig. 3) and filling defect of the renal pelvis (Fig. 4) are illustrated.

Discussion

The usefulness of antegrade pyelography has been amply elaborated in all our cases. This procedure can be undertaken with total safety in all age groups, including neonates. None of the patients in this series even remotely experienced any ill effects from this procedure; Lundin and Wadstrom (1965), however, reported a rise in temperature of 1°C or more in some of their patients. Two of our patients underwent surgery shortly after this procedure, no evidence of urinary extravasation, haemorrhage or renal laceration was observed in either.

The technical simplicity of antegrade pyelography merits emphasis; as a matter of fact

in the presence of dilated calyceal system this is a less cumbersome procedure than retrograde pyelography and can be safely undertaken in any hospital with only basic radiological facilities. One should also take note of the fact that not infrequently, retrograde pyelography becomes impossible in patients with urinary bilharziasis due to either to ureteric meatal stenosis or associated marked supero-lateral deformity of the lower ureter. While it is true that delayed high dose urography in patients with intact renal function on most occasions will provide a fair outline of the dilated pelvi-calyceal systems the deliniation of the ureter in most situations, however, leaves much to be desired (Fig.1).

A clear visualization of the ureter in cases with obstructive uropathy assumes a greater relevance in countries with endemic bilharziasis, as multiple ureteric strictures are frequently observed in this parasitic disorder (Fig.2). In the event where the affected kidney remains *radiologically non-visualized* and ultrasonography is not available to determine calyceal morphology, antegrade pyelography should probably be abandoned in favour of a retrograde examination.

TABLE

NO	AGE/SEX	IVU FINDINGS	RETROGRADE	ANTEGRADE FINDINGS
1	45 yrs M	Gross bilateral hydronephrosis, poor ureteric deliniation	Failed	Multiple bilateral ureteric strictures
2	35 yrs M	Faint opacification of dilated calyces (left)	Failed	Multiple left ureteric strictures
3	42 yrs M	Faint opacification of dilated right pelvi-calyceal system	Failed	Multiple right ureteric strictures
4	60 yrs M	Non-functioning right kidney	Failed	Reno-colic fistula
5	30 yrs F	Markedly dilated left pelvi-calyceal system only	Not attempted	Pelvi-ureteric junction obstruction (PUJ)
6	50 yrs M	Faint opacification of dilated left calyces	Failed	PUJ obstruction
7	42 yrs F	Non-functioning left kidney	Not attempted	Multiple ureteric strictures
8	45 yrs M	Faint opacification of dilated right calyces	Not attempted	PUJ obstruction
9	30 yrs F	Non-functioning right kidney	Not attempted	Multiple ureteric strictures
10	40 yrs F	Marked hydronephrosis non-visualization of the ureter	Not attempted	PUJ obstruction
11	48 yrs M	Non-functioning right kidney	Failed	Hydronephrosis with filling defect
12	3 days M	Non-functioning right	Not attempted	Congenital PUJ obstruction
13.	29 yrs M	Gross right hydronephrosis	Not attempted	Multiple ureteric strictures
14.	22 yrs F	Gross right hydronephrosis	Not attempted	PUJ obstruction.

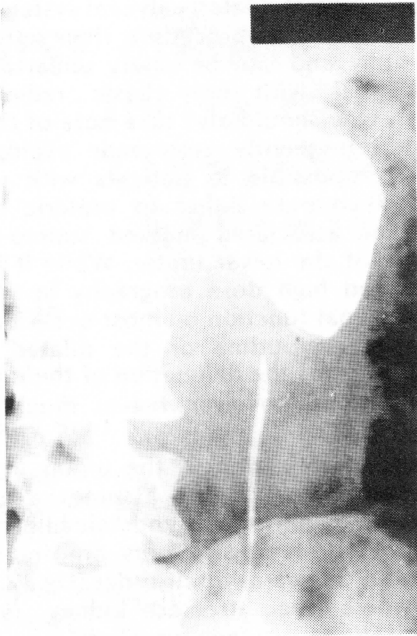


FIG. 1. A case of pelvi-ureteric junction obstruction. Excellent delineation of the characteristic radiology appearance of this pathology by antegrade pyelography.

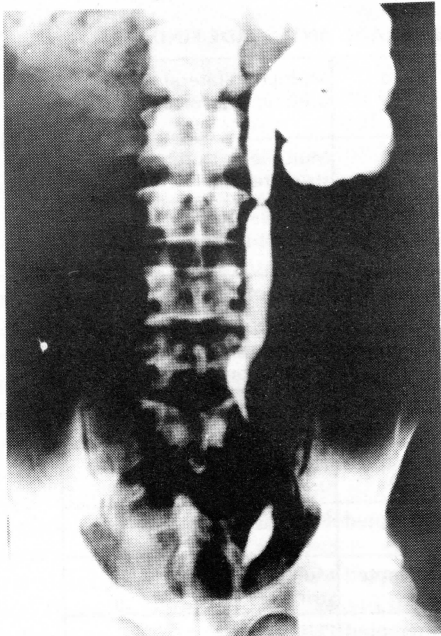


FIG. 2. Clear demonstration of multiple ureteric strictures by antegrade ureterogram. The IVU merely indicated the possible presence of a dilated ureter.

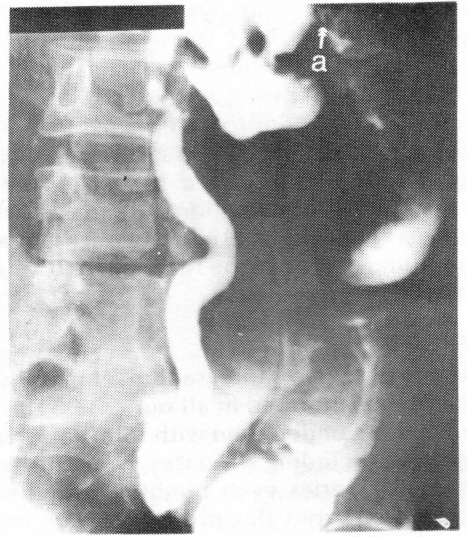


FIG. 3. Filling of the colon on injection of dye into the renal calyceal system. The site of the reno-colic fistula is demonstrated by an arrow marked 'a'. The dilated ureter and the site of a ureteric stricture are clearly shown. The kidney was non-functioning on IVU.

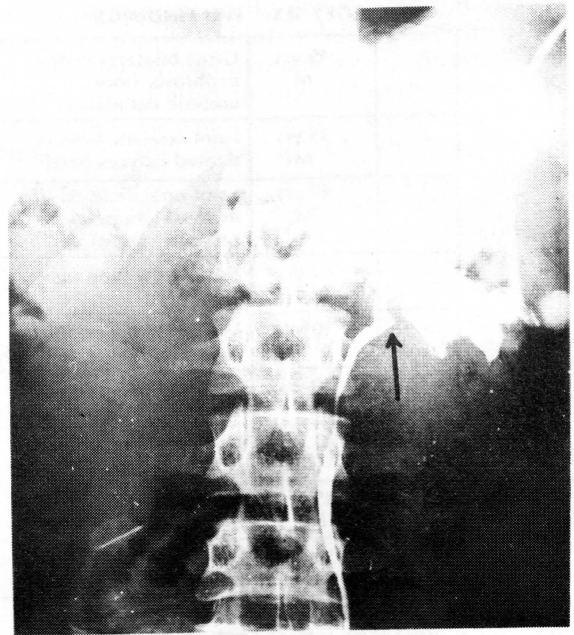


FIG. 4. Filling defect at the renal pelvis (arrow) secondary to extension of renal carcinoma. The kidney was radiologically non-functioning.

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