At our mother's knee

Urography prior to prostatectomy

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Summary: As part of the pre-operative assessment for prostatectomy, the routine intravenous urogram continues to be requested by many practitioners.

One hundred and ten patients being considered for prostatectomy underwent, prospectively, intravenous urography and trans-abdominal ultrasound. This paper specifically examines the respective contribution to management of these investigations. In 34% of patients, management was influenced in some way. This could have been achieved by ultrasound and plain abdominal radiograph alone. Additional intravenous urography would not have affected the clinical management of any patient.

Introduction

Many surgical units continue to perform routine intravenous urography (IVU) prior to prostatectomy, resulting in a substantial workload for radiology departments, as well as considerable expense. If all of the 33,700 prostatectomies performed in England in 1983 (DHSS, 1983) had a routine IVU, at a cost of approximately £40 per patient (60 units of radiographer time) the approximate cost to the National Health budget would have been £1.3m. Furthermore, although the risks of the intravenous injection are slight they remain a source of concern. There is a mortality rate of 1:12,500 in patients over the age of 65 and one third of this for younger patients. Side effects such as nausea and vomiting, skin rashes and asthma are more common (Ansell *et al.*, 1980). Accountability and audit are, increasingly, the responsibility of all who practice medicine in this country and the role of such expensive investigations must be clearly defined. Several authors have already questioned the continued use of this investigation (Bauer *et al.*, 1980; Marshall *et al.*, 1975; Morrison, 1980; Christofferson & Moller, 1981) primarily on the grounds of its low diagnostic yield.

Renal function is better estimated by serum biochemistry and urodynamic assessment of bladder outflow obstruction is more valuable than static radiographic images. Ultrasonography shows upper tract dilatation as reliably, with less risk, more quickly

and more cheaply than an IVU. Bladder size (Poston *et al.*, 1983) and prostatic size (Smith & Havel, 1982), diverticula and stones, can now be accurately shown by trans-abdominal ultrasound. Prostatic structure (Peeling & Griffiths, 1984) can now be clearly demonstrated by transrectal ultrasound.

However, despite the benefits of ultrasonography (Matthews *et al.*, 1982) most clinicians are acutely aware of the vital importance of both skilled performance and interpretation of the scans by the ultrasonographer and many remain sceptical about it replacing urography in routine practice. In addition, the fear of missing an abnormality which may alter the predetermined surgical management, coupled with increasing feelings of medico-legal vulnerability, encourage persistent reliance on the familiar, interpretable image of the IVU.

Patients and methods

One hundred and ten consecutive patients (age range 48–85, mean 68 years) referred for prostatectomy were assessed prospectively. A clinical opinion was initially formed on the need for prostatectomy. After routine biochemistry and urinalysis, all patients underwent intravenous urography. Ultrasound of kidneys, right upper quadrant and bladder were performed at the same visit. Reporting was double blind by separate radiologists.

Subsequently 83 patients underwent surgery, 71 having transurethral prostatectomies. Investigative predictions were correlated with subsequent operative

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findings and their overall influence on management was assessed retrospectively in each case.

Results

Five patients, (4.5%) underwent urgent prostatectomy for the relief of renal failure and 58 patients (53%) were booked for routine prostatectomy to relieve symptoms of outflow obstruction. In all of these, the decision had been made at initial assessment. A further 47 patients (42.5%) were considered either not to warrant surgery, or to require further evidence before a decision could be made.

Urography was indicated on clinical grounds in 33 patients (Table I). Table II shows the abnormalities detected and, by implication, which abnormalities

were missed by each investigation. Of the 77 cases in whom urography was 'routine' there were 15 with abnormalities (Table III).

The combination of IVU and ultrasound, had no overall effect on management in 73 patients (66%). In the remaining 37 patients (34%) subtle effects on management occurred, as outlined below. However, all of these effects could have been based on ultrasound and plain abdominal radiograph alone. The additional findings on IVU would never have modified the course already adopted.

These 37 cases were as follows. Three patients underwent planned open cystotomy on the basis of the prior ultrasonic and radiographic diagnosis of a bladder diverticulum and large bladder calculi. A bilateral orchidectomy was pre-planned for one patient with clinically detected prostatic carcinoma, because of the ultrasonic diagnosis of upper tract dilatation. In 8 patients where a clinical diagnosis of obstruction was equivocal, the decision to operate was undoubtedly influenced by ultrasonic evidence of poor bladder emptying or dilated upper tracts. Following surgery, in all except one, the symptoms had resolved at out-patient review 6 weeks later. Conversely, in 16 cases normal investigative findings weighed heavily against surgery. In the remaining 9 patients, recognition of concurrent abnormalities, although not affecting management of this episode, provided background information that was arguably of benefit to future management. These included two renal calculi, one

Table I Indications for preoperative urography in 110 patients.

Haematuria	5
Previous history of renal disease	4
Raised serum urea or creatinine	4
Clinical suspicion of malignancy	8
Urinary tract infection or loin pain	11
Palpable kidney	1
Routine investigations	77

Table II Abnormalities shown by preoperative intravenous urography and ultrasound in 110 patients

	Both IVU & U-S	U-S alone	IVU alone
Upper tract	2 Duplex systems 1 Solitary kidney 1 PUJ obstruction 13 Benign cysts 1 Renal calcification 6 Dilated upper tracts	5 Benign cysts	1 Malrotation 1 Renal Calcification 4 Minimally dilated
Bladder	3 Calculi 2 Diverticula 1 Ureterocoele	1 Diverticulum 1 Calculus 1 Papilloma	3 Diverticula

IVU = intravenous urogram; U-S = ultrasound; PUJ = pelviureteric junction.

Table III Abnormalities detected by intravenous urography in patients* who had no specific indication for urography

Benign renal cysts	7
Dilated upper tracts	5 all had normal renal function
Calcified renal calyx	1
Small bladder diverticula	3 none subsequently seen at cystoscopy

*One patient had 2 abnormalities

pelvi-ureteric junction obstruction, one bladder calculus, three small diverticula, one ureterocoele, and one ureteric stone.

Discussion

The use of 'static' imaging to support the diagnosis of bladder outflow obstruction is unnecessary in most patients. Where there is equivocal clinical and urodynamic evidence of obstruction, the addition of video micturating cystography (combined with cystometry) is undoubtedly desirable. In most centres which lack these facilities, however, a simple ultrasonic confirmation of large residual urine or upper tract dilatation may add weight to the balanced clinical judgement which has to be made in a few patients.

Asymptomatic upper tract disease is no more common in patients with bladder outflow obstruction than in their non-obstructed peers. In our series the diagnostic 'yield' of such abnormalities compares with

other series (Bauer *et al.*, 1980; Pinck *et al.*, 1980). It is often said that an investigation is only justified if the result alters management. This happened, in a minor way, in a small number of our patients. Nevertheless, the potential benefits incurred by ultrasound and plain abdominal radiograph were worthwhile. In no case did the addition of intravenous urography effect further the management decisions already made.

We sympathize with the feelings of security and familiarity provided by the IVU before embarking on routine prostatic surgery. However, these emotions are not supported by the facts and we conclude, therefore, that the routine use of urography where no prior clinical indication for it exists, should be abandoned.

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