direct percutaneous puncture of the kidney.¹⁴ This method has the added advantage that pressure-flow studies can easily be performed to confirm obstruction when the results of other tests are equivocal. All such methods should be preceded by ultrasonic scanning.

A ureteric fistula is still a dreaded complication in the immunosuppressed patient, with an incidence of between 5% and 12% of transplants. Fistula is only half as common as obstruction, but the mortality—which may be as high as 33%—is double. Most fistulas are due to human error. The sole arterial supply of a transplant ureter is the descending branch of the main artery or of its lower polar branch. Damage to the vessels can easily be sustained during donor nephrectomy, particularly if the hilum is dissected too enthusiastically or if the ureter is “skinned.” This is particularly likely if there is a multiple arterial supply, as the ureteric branch may arise quite proximally from the small lower polar vessel. Leakage can also occur from an ischaemic polar calix if the kidney is segmentally infarcted.

Rejection may be another cause of ureteric ischaemia and necrosis. A dead ureter can still act as a conduit of urine for some time after its blood supply has been occluded, so that perforation and extravasation may be delayed. In some circumstances a kidney may recover from a rejection episode to resume production of urine, which can then leak from the ureter a week or two after its destruction from ureteric artery thrombosis.

Clinical recognition of extravasation from a fistula is not usually too difficult, since the patient may complain of tender induration over the graft and have swelling of the external genitalia. A mass may be palpable on pelvic examination, though this may be due to a cystic lymphangioma. An intravenous urogram may confirm extravasation, and again ultrasound is often helpful.

The Guy's experience emphasises that definitive surgical treatment should be undertaken without delay. No rules for technique can be laid down, but the surgeon will usually need to reimplant the ureter where it is viable, using the existing host ureter, swing up a flap of bladder after hitching it to the psoas, or rarely and reluctantly use a loop of bowel to connect pelvis to bladder or to the skin as a conduit diversion.¹⁵ In all cases prolonged splintage will be required, conveniently with the modern internal self-retained stent.¹⁶ If at all possible the dosage of steroids should be reduced.

The importance of vesicoureteric reflux in patients who have had transplants is controversial.^{9 10 17-19} Matthew and his colleagues argued persuasively that it might be a cause of late deterioration in function mimicking chronic rejection.¹⁹ More recently other authors have described groups of patients in whom reflux is quite common, owing perhaps to the use of an extravesical technique of implantation, but they have been unable to incriminate reflux as a cause of deteriorating function or of lesser problems such as urinary infection and hypertension. If this view proves correct, it will provide further evidence of the relative unimportance of reflux of adult onset.

Renal transplantation is now a standard and straightforward surgical procedure. Once the incidence of avoidable complications has been minimised the urologist will be able to devote his attention to other challenging problems such as reconstruction of congenitally or surgically damaged or diverted urinary tracts before transplantation.

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Letting intrauterine devices lie

The old Gräfenberg ring, introduced in about 1928, was made of coiled silver wire and was usually renewed at yearly intervals. If it was left longer the silver tended to corrode and the ring might become embedded and difficult to remove.¹ Its use fell out of favour, and the method was little used until the late 1950s, when the development of biologically inert plastics made possible the production of intrauterine devices that were cheap, simple to insert, and did not have to be changed at regular intervals.

Many types of intrauterine device were produced and evaluated in the 1960s,² but the only two of these which are likely to be seen now are the Lippes loop and the Saf-T-Coil, both of which are recommended as suitable to remain in the uterus indefinitely.^{3 4} Copper-bearing devices such as the copper 7 and copper T were introduced in the early 1970s, and replacement was recommended after two to three years of use because of the deterioration of the copper wire.⁵ As these devices have become much more popular than the larger inert intrauterine devices, the younger generation of family planning doctors have little experience of the loops and coils and have come to question the advisability of leaving them in the uterus for years on end.

A detailed study⁶ of the Lippes loop over 10 years and 27 954 woman-months showed that the pregnancy rate was highest during the first two years, after which it fell to an annual average of 0.5. The rate of removals for bleeding and pain was also highest during the first two years, after which it fell more slowly. All expulsions occurred during the first three years. Though the pregnancy rate falls with length of use, the rate of ectopic pregnancies remains constant, and clinicians need to remember that if accidental pregnancy occurs in a woman who has worn an intrauterine device for more than three years, the chance of it being ectopic is about one in 10.⁷

What about infection? Women using intrauterine devices are more likely to develop pelvic inflammatory disease than other women. Infection is most common during the first year after fitting but may occur at any time.⁸ Controversy continues whether this is due to migration of organisms from the vagina and cervical canal into the uterine cavity along the threads of the intrauterine device.^{9,10} Attention has been drawn recently to the presence of actinomyces-like organisms in the cytological smears of women wearing intrauterine devices, particularly if inert and in situ over a long period.¹¹⁻¹⁴ Most of these patients have no symptoms, but others complain of vaginal discharge and bleeding or pain. The optimum clinical management of these women remains uncertain. Overall, current data provide no support for the suggestion that inert intrauterine devices need to be changed in women free from side effects or that replacement would reduce the risks of infection.¹⁵ Actinomycosis is a rare cause of pelvic inflammatory disease associated with the intrauterine device, and only a few cases have been reported.^{16,17} Further research into this problem is in progress.

Little has been written about difficulties encountered in the removal of the long-term intrauterine device. All devices tend to accumulate small deposits of calcium, and this may be associated with some corrosion of the underlying plastic.¹⁸ The strength of materials of the device or tail, or both, may be compromised with time, and the intrauterine device may become embedded in the endometrium. Avulsion of the tail occurs most commonly with longer duration of use and in devices being removed for bleeding and pain.¹⁹ Removal may become more difficult after the menopause because of atrophy of the uterus and cervical canal. I have been fitting intrauterine devices since 1964 and have had few problems in removing Lippes loops, even those which have been in place for as long as 15 years. The threads of the loop do not seem to disappear into the uterus nearly as often as the tail of the copper 7. I have, however, encountered the occasional loop which has become impacted or disintegrated in the uterus, but in most the plastic appeared to be in good condition even after many years.

Another inert intrauterine device which may be seen occasionally is the Dalkon Shield, introduced in 1970. It had a multifilamentous tail (as opposed to the monofilamentous tails of other intrauterine devices) which was thought to be the cause of the higher rate of pelvic inflammatory disease with this device,^{8,10} and it was withdrawn from the market in 1975 after deaths from septic abortion in patients who had become pregnant with the shield in situ.²⁰ Because of the increased possibility of pelvic infection, the Dalkon Shield should always be removed, whether or not it is causing symptoms. If the findings on pelvic examination and cytological investigations are normal and the patient wishes to continue

with this method of contraception the shield should be replaced by one of the newer types of intrauterine device.

So how long should an inert intrauterine device remain in the uterus? Clearly it should be removed if it is causing symptoms, but what should be done for the woman who has been wearing her device happily for many years, is free from symptoms, shows nothing abnormal on pelvic and cytological examination, and does not want it to be changed? Should she be subjected to the greater complication rate encountered with a newly fitted intrauterine device and the possibility that another device would not suit her so well? In my opinion she should be allowed to continue as she is, provided that she agrees to return for routine medical examination, including a cervical smear, at yearly intervals and to report immediately if she develops any gynaecological symptoms. The intrauterine device should eventually be removed one to two years after the menopause, and in most cases this will be accomplished without difficulty.

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