THE DIAGNOSIS OF BLADDER TUMOURS*

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The commonest presenting symptom of a bladder tumour is haematuria, which may be repeated but frequently occurs on one occasion only. In males over the age of 40, about half the cases are due to neoplasm. It is therefore obvious that haematuria, however slight, should always be considered seriously. Thus the first essential in diagnosis is the proper investigation of all cases of haematuria. This phase is usually the responsibility of the general practitioner.

CLINICAL INVESTIGATIONS

These patients should have a full clinical examination, which, although usually negative, should not be neglected. An I.V. pyelogram is often helpful for it shows the state of the upper urinary tract and it may on occasion reveal a primary tumour of the renal pelvis or ureter, or the bladder tumour may be seen as a filling defect in the cystogram. Cystoscopy usually facilitates location of the tumour and its macroscopic characters can be observed. The exact pathology of the growth is determined by biopsy. A careful bimanual pelvic examination should be done under anaesthesia, for if the growth is palpable, it is almost certainly an infiltrating carcinoma. All these steps are universally accepted and should be carried out as a routine in every case.

In recent years evidence has accumulated that the examination of the urine for neoplastic cells, using the Papanicolaou stain, may be of value. Hazard *et al.*[5] found neoplastic cells in 70% of cases with bladder tumours, and in cases with no tumour there were only 5·8% false positives. Rowland and Marshall[13] noted that a number of their cases with false positives later developed bladder tumours. They found the test positive in 95% of their cases. This test, therefore, should be used in the follow-up of cases with bladder tumours, particularly if neoplastic cells can be detected before the growth can be seen cystoscopically. The test may also be used in cases of haematuria, when full investigation is negative, for some of these cases may later manifest a bladder tumour. It has also been suggested as a screening test for workers in the dye industry, for it is more acceptable to the workers than a cystoscopy.

ASSESSMENT

The prognosis of bladder tumours depends almost entirely on the histology of the tumour, and the depth to which it has infiltrated through the bladder wall. Pugh[12] has shown that most tumours of a low grade of malignancy are confined to the mucosa and submucosa, while those that have infiltrated the muscle layers are mostly of a high degree of malignancy.

In view of the good results which are being obtained in the treatment of bladder tumours by transurethral resection and closed radon implants (Milner,[10] Emmett and Winterringer,[4] Yates-Bell and Hendricks[14]), it has become important to assess the histology and the depth of penetration endoscopically. Today there is little doubt that the best, and probably the only, method by which this can be achieved, is by means of the resectoscope. This method was strongly advocated by Milner[9] in 1949, who found that his biopsy reports were remarkably accurate when compared with the operative specimens. These findings have since been confirmed by a number of workers.

The great advantage of the resectoscope is that the base of the tumour can be resected and, if muscle is included, histological assessment of muscle infiltration can be made. It can be argued that infiltration of muscle can be assessed by a bimanual pelvic examination. Marshall[7] found that 33% of growths which were not palpable on bimanual examination showed infiltration of muscle in the operative specimen. Thus, this method alone is too inaccurate.

When examining a bladder which is the seat of a tumour, careful attention should be given to those parts not involved by the tumour, for Masina[8] has described areas of reddening and oedema which may occur next to the growth or on occasion remote from it; biopsy specimens of these areas should be examined. One illustrative case has recently been seen, where a patient had a solid carcinoma at the bladder neck and an area of oedema on the dome which on biopsy showed carcinoma. This case probably illustrates the thesis of Roger Baker[1] that if the growth has gone through the muscle layer the lymphatics of a considerable area of the bladder are involved.

One difficulty in the use of the resectoscope is the treatment of growths in the dome of the bladder in the male, partly due to the mechanical difficulty and partly because the size of these tumours is more difficult to assess. Beach[2] has suggested operating on these cases through a perineal urethrostomy in the prone position. An easy way out of the difficulty is to obtain a biopsy specimen of the growth with a rongeur and, if the growth is malignant, a partial cystectomy can be done.

LESS MALIGNANT TUMOURS

All bladder tumours have a tendency to recur and they should therefore be examined periodically for many years. It may therefore be of value to consider the behaviour of certain of the less malignant papillary tumours.

The typical villous papillomata with narrow pedicle, delicate fronds and benign histology do very well on cystoscopic diathermy, even though they continue to produce recurrences for many years. However, Deming[3] found that 7·8% of his cases developed malignant tumours over a 15-year period.

The group of sessile papillary tumours with stunted fronds are on the borderline between the benign and the malignant. In the past the response of these tumours to cystoscopic

* Paper presented at the Second Congress of the Urological Association of South Africa (M.A.S.A.), Cape Town, July 1958.

fulguration was used as a method of diagnosis. Irvine[6] has shown, however, that when it becomes obvious that the tumour is not responding, it has usually infiltrated through the bladder wall. He also found that when this group of tumours was treated by cystoscopic fulguration, without biopsy, 50% died of carcinoma within 5 years. These tumours should be handled by transurethral resection, for they are then more adequately excised and a biopsy is obtained.

Papillary tumours which are excised by open operation may give rise to implants in the wound; these implants are almost invariably malignant. However, in cases being treated endoscopically, growths may implant on the bladder neck, probably on areas which have been traumatized by the instruments. These implants are usually not malignant.

DIAGNOSTIC DIFFICULTIES

As a rule the diagnosis of bladder tumours is straightforward. There are, however, some clinical problems as well as some difficulties in cystoscopic interpretation, which should be considered.

On occasion cases of haematuria are fully investigated and no abnormality found. Some of these cases may later show bladder tumours. The diagnosis may be missed because of the small size of the growth or its occurrence in a 'blind area' in the dome, particularly if there is an associated enlargement of the prostate. It is in this group of cases that the examination of the urine for neoplastic cells with the Papanicolaou stain may be of value.

A patient with a bladder tumour may present with retention due to prostatism and no history of haematuria, and it is for this reason that a cystoscopy is done as a preliminary to a prostatectomy.

An embarrassing source of error is an incorrect pathological report. This difficulty appears to have been more prevalent when small specimens were taken with small biopsy forceps. When reasonable amounts of tissue are taken with the resectoscope, errors are uncommon.

Inflammatory changes in the bladder, due to tuberculosis, diverticula, stones, indwelling catheters, vesico-intestinal fistula or bilharzia, may all simulate carcinoma on cystoscopy, but are usually distinguished by biopsy. Irradiation cystitis, particularly if the irradiation has been given for a bladder tumour, may cause considerable difficulty, and here again the diagnosis is made on biopsy examination.

Carcinomas of adjacent organs may invade the bladder and present like primary bladder tumours. The commonest are carcinoma of the colon, the rectum, the uterus, the cervix and the prostate. In these cases the bulk of the tumour is felt outside the bladder, on pelvic examination, and the biopsy specimen does not show the histological features of a bladder tumour.

Cystitis cystica and cystitis glandularis are not uncommon metaplastic lesions, occurring in bladders which are the seat of chronic or recurrent infections. They are usually quite innocent, but recently Nesbit[11] reported a case which showed typical cystitis cystica and glandularis on cystoscopy, but the biopsy showed adenocarcinoma. One patient has been seen where typical cystitis cystica and glandularis were found on cystoscopy, but the biopsy examination showed adenocarcinoma. This patient ultimately died of bladder carcinoma with secondary deposits in her spine.

The assessment of cases who have had a partial cystectomy for carcinoma may cause difficulty, for a malignancy may be present outside the bladder and a villous papilloma in the bladder. For example, an elderly lady had a partial cystectomy for carcinoma and 2 years later she had a typical villous papilloma of the bladder, which was fulgurated. She was found to have an enlarged gland in the neck, which showed transitional-cell carcinoma on biopsy. She later died from metastases.

SUMMARY

In the diagnosis of bladder tumours the first essential is the institution of appropriate investigations in all cases of haematuria. These investigations are an intravenous pyelogram, a cystoscopy, a biopsy and a bimanual pelvic examination under anaesthesia.

The histology of the tumour and the depth to which it has invaded the bladder wall is assessed by removing the tumour and its base with the resectoscope and submitting the pieces to microscopic examination. Assessment by this method is remarkably accurate.

In spite of all the diagnostic aids, there are still some pitfalls and difficulties, most of which can be solved by careful clinical and cystoscopic examination, together with histological examination of biopsy material.

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