Treatment of Advanced Carcinoma of the Prostate by Yttrium-90 Ablation*

J. STEYN, D. W. BLAIR AND A. MORALES, Royal Infirmary, Aberdeen, Scotland

SUMMARY

Twenty-four patients treated by yttrium-90 ablation of the pituitary gland are presented. In 50% of the patients there has been a good symptomatic response to treatment and a further 25% have had a partial response to treatment. It is a comparatively simple and safe method of treatment and is well worth while considering in the management of the late stages of carcinoma of the prostate.


As carcinoma of the prostate is insidious in its early stages, relatively few patients are suitable for radical surgery and thus our therapeutic armamentarium is aimed at palliation rather than cure.

Franks proved the existence of large venous channels connecting the prostate and the bones of the pelvis. This supported the earlier premise by Batson who had suggested that tumour cells from the prostate may reach the bones of the pelvis by the vertebral venous plexus. Aside from local lymphatic spread the commonest sites of spread of carcinoma of the prostate are the bones of the lower spine and pelvis.

Evidence that normal adult prostatic epithelium atrophies secondary to castration has been known at least since the time of John Hunter (1840). Huggins and Hodges showed that castration or oestrogen therapy also affects prostatic cancer. Since then, anti-androgen therapy, by means of oestrogen administration and/or castration, has become the treatment of choice, especially for patients with bone pain due to secondary deposits from carcinoma of the prostate.

In man, after castration, there is a temporary decrease in the levels of 17-ketosteroids in the urine, but the levels rise after variable periods of time. A similar response has been observed after the administration of oestrogens.

The concept that other glands may play a role in the function of the prostate has led to the use of adrenalectomy and hypophyseal ablation in the treatment of relapsing carcinoma of the prostate.

MATERIAL AND TECHNIQUE

The technique of the yttrium implantation is that described by Forrest et al. Under general anaesthesia, two 5 mCi *Y sources contained in nylon cylinders and secured in stainless steel screws, were placed transnasally within the sella turcica under radiographic control. The procedure is done under antibiotic cover. Cortisone therapy is started on the day before operation and thyroid replacement is commenced on the third postoperative day.

Material

Twenty-four patients with advanced carcinoma of the prostate who had failed to respond to oestrogen treatment or who had relapsed after an initial response, underwent hypophyseal ablation by *Y implantation. The age range was 52-76 years with a mean age of 67 years.

The patients were divided into two groups: group 1 patients were treated by oestrogen alone (18 patients) and group 2 patients by bilateral orchidectomy and oestrogens (6 patients).

Complications

There were no deaths attributable to the procedure but 1 patient collapsed and died in the car park from a pulmonary embolus, as he was leaving the hospital.

There were no cases of persistent rhinorrhoea or meningitis in the present series.

Damage to the posterior pituitary gland is not uncommon. It is routine to check the urine output and urine specific gravity after the operation. In 8 patients (33%) diabetes insipidus developed: in 2 this was temporary and did not require treatment. The remaining 6 patients (25%) were treated with either pituitary snuff or pitressin tannate in oil injections. In many patients, the severity of the diabetes insipidus decreased with the passage of time and presumably this is related to the fact that total destruction of the pituitary by the technique of yttrium implantation is incomplete.

Myxoedema is an inevitable sequel to pituitary ablation. It has been suggested that replacement therapy could be delayed for up to 2 months after the operation but it has been our practice to commence treatment in the immediate postoperative period.

RESULTS

The response to pituitary ablation was classified according to the criteria described by Fergusson and Phillips. A good response implied those patients in whom bone pain was relieved completely up to death or until shortly before death.
A moderate response included those patients who had a partial but significant relief of their symptoms or had complete relief followed by a longer period of relapse.

No response was signified by the absence of improvement or by death which occurred within one month of ablation.

In group 1 (oestrogen-treated patients) 10 patients (55%) were classified as having a good response; 4 patients (22.5%) showed some response; and 4 patients (22.5%) failed to respond.

In group 2 (orchidectomy and oestrogen) 2 patients showed a good response; 2 patients showed a good response for a short duration; and 2 patients failed to respond.

Combining groups 1 and 2 over-all results of pituitary ablation with "Y are shown in Fig. 1.

Yttrium-90 ablation is a simple method of treatment which requires a short hospital stay and causes little upset to the patient. Roberts et al. showed that in breast cancer yttrium implantation is as effective as transsplanchnic hypophysectomy and has the advantage of being a lesser operative procedure. The procedure is purely palliative and it is usually performed late in the course of the disease. Stewart et al. showed that in carcinoma of the breast very early pituitary ablation may actually have been harmful to the patient and presumably the same situation pertains to carcinoma of the prostate.

The results in the present series are similar to those reported by other authors and are summarized in Table I.

Yttrium-90 hypophysectomy in the treatment of metastatic carcinoma of the prostate gland compares favourably with medical and surgical adrenalectomy. The results are also comparable to those following intravenous administration of radioactive phosphorus.

**REFERENCES**