THE TREATMENT OF CARCINOMA OF THE PROSTATE GLAND

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Treatment of carcinoma of the prostate gland is still the subject of considerable controversy among urologists, and the mortality from this condition remains high. In 1927, statistics from the United States Census Bureau showed that of every 100,000 deaths reported among men, 5.6 were caused by malignant disease of the prostate gland. In 1934, carcinoma of the prostate caused 5.2 of every 100,000 deaths, according to the Bureau of Vital Statistics.

During the past ten years, various methods of treatment have been employed at the Cleveland Clinic in an attempt to evaluate the merits of each. Early recognition of the malignant process is essential and an understanding of the most frequent site of primary involvement and the usual mode of extension are of paramount importance in determining the efficacy of proposed treatment.

While the majority of carcinomas involving the prostate gland probably arise in the posterior lobe[1], the initial lesion may originate in any portion of the gland or its accessory lobules. Geraghty[2] demonstrated that in the majority of cases the primary site of the lesion is in the posterior lobe, i.e., the portion of the prostate lying between the base of the bladder and the fascia of Denonvillier. This is in accordance with the observations of R. A. Moore[3] who studied fifty-two cases in which the lesion was sufficiently small that an accurate determination of the point of origin could be made. He found that 73.5 per cent arose in the posterior lobe, 8.8 per cent in the lateral lobes, and 14.8 per cent in the anterior lobe. Rolnick[4] states that the posterior lobe is the primary site of involvement in 80 per cent of the cases of carcinoma of the prostate but Randall[5] makes the statement that, "There is no evidence found in this series to substantiate a previous conception that is prevalent in the literature that malignancy of the prostate has its origin in the posterior lobe." In the series reported by Ferguson[6], 12 per cent of the carcinomas originated in or involved the lobules about the bladder neck.

That carcinoma of the prostate does not arise solely in the posterior lobe is evidenced by cases in which prostatectomy has been performed for apparently benign hypertrophy and pathological examination has revealed a small malignant lesion originating in lobes other than the posterior which is free from any malignant process. Rolnick[4] states that from 10 to 20 per cent of the operations performed at Cook County Hospital for benign prostatic hypertrophy have revealed carcinomatous involvement. Thus while carcinoma of the prostate arises in the pos-

terior lobe in the majority of cases, it must be appreciated that the primary lesion may originate in any portion of the gland. In doubtful cases, aspiration biopsy is of value in rendering a correct diagnosis, and there should be no hesitancy in employing this valuable procedure.

Extension of the Lesion and Metastases

Carcinoma of the prostate is said to be slow in growing and late in metastasizing. Bumpus[7] reported that metastases to the bones had occurred in 28 per cent of his cases when examination was first made, while Barney and Gilbert[8] found metastases in 58 per cent. In our series of 286 cases, radiological evidence of osseous metastases was present in ninety-five or 33 per cent, and in thirty-nine there was evidence of lymphatic extension.

Barringer[9] has stated that the carcinoma was confined to the capsule in only 2 per cent of his cases when the patient was first seen at the Cancer Memorial Hospital. Colston[10] found that thirty-six of 1,040 cases of carcinoma of the prostate were suitable for the radical operation.

According to Ewing[11] the clinical course of prostatic carcinoma is dependent on the structural type of the tumor, different forms appearing as radically different diseases. In studying the growth and extension of prostatic carcinoma, invasion of the perineural lymphatics is seen to occur early; however, metastases and extension beyond the capsule occur later. From his studies of the extension of this malignant lesion, Moore[3] believes that when the primary focus is in the posterior lobe, there is an early spread in the cephalocaudal direction just beneath the capsule. This extension, however, rarely crosses in the midline. If the lesion originates in the anterior lobe, the spread is in a more lateral direction and it crosses the midline. Moore states that a lesion arising in the lateral lobe is usually confined to one section which is less than 8 mm. in diameter, until it spreads laterally to the capsule, at which time it becomes similar to a lesion of the posterior lobe. In analyzing the cases at the Cleveland Clinic, early recognizable tumors of the prostate were rarely seen, and in most cases extension beyond the confines of the gland had occurred or metastases were demonstrable at the time of examination.

Treatment

In considering the treatment of carcinoma of the prostate, the procedure to be instituted varies with the conditions present and we believe four groups may be considered.

1. Cases in which minute lesions are associated with prostatic hypertrophy for which prostatectomy has been performed and carcinomatous involvement has been found on miscroscopic examination.

2. Cases in which the carcinoma is confined to the prostate, or in which only early involvement of the vesicles is present.

3. Cases in which the lesion is more extensive, not confined to the prostate, and not producing urinary obstruction.

4. Cases in which the lesion is not confined to the prostate and urinary obstruction is present.

As stated previously, it is estimated that microscopic evidence of malignancy is found in from 10 to 20 per cent of the cases in which prostatectomy is performed for benign hypertrophy, and in our hands the best results have been secured in this group of cases. Barringer[12] has stated that foci of the carcinoma are frequently present in the periprostatic tissue and that manipulation during operation is responsible for squeezing cancer cells out into the surrounding tissue. Following the surgical procedure in this group of cases, it has been our rule to use high voltage roentgenotherapy and to examine the patient frequently for any evidence of recurrence.

In a series of twenty-six prostatectomies for benign hypertrophy in which a malignant lesion was found by the pathologist, no radiation therapy was utilized in seventeen cases, and the average span of life was 35 months. Postoperative roentgenotherapy was employed in seven cases and radium was used in two with a resultant span of life of 48 months. In a second series of twelve cases in which the possibility of malignancy was considered at the time of operation, the seminal vesicles were removed also. Three patients in this series died following operation; seven received radiation treatment postoperatively, and the average duration of life was 12.6 months. Two patients did not receive roentgenotherapy, and the average span of life was 17.2 months.

The radical perineal operation is to be considered in cases in which the growth is confined to the gland or when there is early extension to the vesicles with no evidence of metastasis. This procedure was used in four cases in this series. In three, no radiation was recommended postoperatively and the average span of life was 17.3 months. In one instance, roentgenotherapy was utilized, and the patient lived for 16 months.

Young[13] reports a series of forty-two cases in which the radical operation was used. The operative mortality was 9.5 per cent and 52 per cent of the patients who survived the operation lived over five years. G. G. Smith[14] likewise reports that fifteen of twenty-six patients operated upon by this method lived without recurrence and apparently were cured. Therefore, when it appears technically possible to perform the radical operation, we believe such a procedure is acceptable and justifiable.

When the lesion has extended beyond the confines of the prostate and when extensive involvement and metastases are present without urinary obstruction, high voltage x-ray and radium assume priority in treatment, although a cure rarely or perhaps never can be secured by this method. A retardation of the growth of the tumor and alleviation of the patient's pain as well as cessation of hematuria may be noted.

In a series of 102 cases, radiation has been the only treatment instituted. Roentgenotherapy alone was used in eighty-three, and the average span of life was 16.2 months. Radium alone was employed in nine with an average span of life of 11 months, while in ten cases in which both radiation and radium were used, the average duration of life was 13.9 months.

Finally, in the group of cases in which symptoms of urinary obstruction predominate, we believe transurethral resection followed by roentgenotherapy is advisable. Caulk and Boon-Itt[15] reported a series of eighty-one cases in which the punch operation was employed alone or in combination with radiation or radium. They found that the combined treatment yielded the best results; 10 per cent of their patients were living or had lived five years after operation.

We have performed sixty-two transurethral resections for carcinoma of the prostate. This was the only treatment thirty-two of the patients received and the average span of life was 24.7 months. In twenty-seven, postoperative roentgenotherapy was instituted, and the average span of life was 24.9 months. In two cases, combined radiation and radium therapy were employed, and the patients lived for an average of 30 months. One patient died followed operation.

In the vast majority of cases, the symptoms of obstruction can be relieved by transurethral surgery. Although postoperative roentgenotherapy did not noticeably increase the span of life in our series, relief from pain was experienced following its administration. The mortality rate with this procedure is extremely low, and in these sixty-two cases, only one death occurred. We believe transurethral resection is preferable to suprapubic cystotomy or the use of an indwelling catheter. In some instances, it may be necessary to repeat the procedure but, in the majority of cases, relief from symptoms of obstruction occurs following removal of a sufficient amount of tissue.

Conclusions

1. Early diagnosis is essential in the treatment of carcinoma of the prostate.

2. Aspiration biopsy may afford a means of recognizing the malignant lesion before it spreads beyond the confines of the capsule.

3. Radical surgery followed by roentgenotherapy is the procedure of choice in the small percentage of cases in which it is technically feasible.

4. Transurethral resection affords a means by which the obstruction may be eliminated and the mortality rate reduced to the minimum.

5. In inoperable cases, roentgenotherapy is of value in retarding the growth of the tumor, eradicating or lessening the pain, and reducing the bleeding.

6. Careful follow-up observation should be employed in order to note the presence or absence of recurrences.

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