

CANCER OF THE BLADDER *

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A year ago I published an account of an early case of carcinoma of the bladder which Dr. Chute and I removed by the transperitoneal route. The so far successful outcome of this case has encouraged me to present a brief summary of this condition in order to bring up several points for discussion in regard to cancer of the bladder; also to endeavor to sum up the results so far obtained by the transperitoneal operation.

In this presentation the term "cancer of the bladder" is intended to apply to that type of new growth which is early infiltrating and which requires the resection of a greater or less portion of the bladder wall for its removal; it does not apply to that form of prostatic growth which may simulate so closely cancer of the bladder.

Cancer of the bladder occurs as a primary sessile growth which originates in the mucous membrane and is infiltrating from the start, or as the degeneration of the base of a more or less pedunculated papilloma. It is with the first condition only that I shall deal. The secondary involvement of the bladder from the extensions of a carcinoma from a neighboring organ should not be considered in this connection.

PATHOLOGY

The bladder mucous membrane being normally free from glands, the commonest form of carcinoma is one made up of solid atypical masses of epithelial cells infiltrating the bladder wall. Occasionally, however, the carcinoma takes the form of an adenoma; it being evident that an adenoma cannot develop from a mucous membrane in which there are no glands, this unusual form of tumor must arise from strayed urethral or prostatic glands or from an embryologic occlusion of a portion of rectal mucous membrane. The rare type of mucous cancer of the bladder which has been described a few times is supposed to arise in this way. Microscopically this form of cancer corresponds exactly to the mucous cancer occurring in the rectum. The cells, instead of appearing as solid masses, take the form of alveoli. The epithelial cells lining these alveoli are typical mucous cells. These alveoli which become distended with mucus occasionally rupture and pour their contents into the adjacent tissue. Clinically this form of cancer does not differ from the ordinary carcinoma, but it is of interest in that it has been so rarely described, the only one reported so far in this country to my knowledge being a case in which Dr. Chute and I operated, which was reported before the New England Urological Society by Dr. A. H. Crosbie of Boston. Most of the other cases have been reported by German observers.

Cancer of the bladder occurs most often in men over 50, is generally situated at the base of the bladder, often in close relation with the ureter openings, and is the most common form of bladder growth.

METHOD OF EXTENSION

The method of extension in carcinoma generally occurs as an infiltration of the various coats of the bladder, which later penetrates into the adjacent struc-

tures. This extension sometimes occurs to an amazing extent in advanced cases. Extension also takes place through the lymphatic channels, but is notably slow, the iliac and lumbar glands becoming involved. The process seldom goes beyond these. Remote metastases are rarely seen. That extension by contact takes place is shown by the recurrences of the neoplasm at the site of previous operation wounds and by the development at points of contact of the mucous membrane and the growth when the bladder is empty. These methods of extension are of importance in relation to the operative treatment.

SYMPTOMS AND DIAGNOSIS

There is nothing in the symptomatology to distinguish this type from any other neoplasm in the bladder. Hematuria is said in general to be less copious in these infiltrating growths; this is purely relative, however, and no dependence can be placed on it in any individual case. Pain, although a common symptom of this type of growth, is by no means constant, as extensive involvement without infection of the movable portion of the bladder may occur with practically no pain. The most striking thing here, as in other forms of bladder growths, is the great irregularity in the symptoms. Cases at times present a perfectly typical train of symptoms of terminal painless hematuria, uninfluenced by rest, etc., while others present symptoms which vary to a marked degree, there often being long intervals between the attacks of hematuria, which may be slight and of short duration. Thus, the time between the appearance of symptoms and the first observation by the surgeon is variously reported as between the extremes of six weeks (as in my own case) and thirty-two years. Another interesting point in this connection is the comparatively long time that may elapse between the appearance of the first symptoms and the extension of the growth outside the bladder.

Accurate diagnosis as to the size, number and position of these growths can be made only by cystoscopy. In general, the early cystoscopic appearance of a bladder carcinoma is that of a slightly elevated tumor of a more or less papillary appearance with elevated indurated edges and a central ulceration of a greater or less extent. The more advanced picture of the more prominent fungating growth with secondary changes of necrosis and ulceration incrustated with urinary salts is characteristic. The question of malignancy, however, cannot be definitely decided by this means; in general, a flat sessile appearing growth is more than suspicious of malignancy as is also any induration by rectal or vaginal palpation. Persistent pain is more common in the advanced stages and suggests that the process has advanced beyond the bladder.

In order to bring out certain points that I wish to make it may be well to state briefly the history of the case mentioned at the beginning of this paper. The patient was a man of 46 with no venereal or other illness of importance. Six weeks previous to operation he began to pass urine more frequently during the day and had to get up once or twice at night. After one week of this increased frequency he noticed a few drops of blood at the end of micturition. This occurred each time, was painless and uninfluenced by rest or motion. Cystoscopic examination showed a slightly elevated area, with a granular or papillary appearance, covered more or less with what seemed to be a yellowish white slough. This was excised with a good margin of healthy tissue by the transperitoneal route, the entire thickness of the bladder wall being included in the resection. The

* Read in the Symposium on Treatment of Tumors of the Bladder in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

pathologic examination showed ulceration of the mucous membrane in the central portion of the specimen; only in a few places had the basement membrane disappeared and the epithelial cells begun to infiltrate the submucous layer, and in no place had the process gone beyond this layer. Cystoscopic examination made a few days ago, thirteen months after operation, showed a perfectly normal bladder with a small smooth white scar at the sight of removal of the growth. There were no symptoms. The urine was clear. From the pathologic report in this case it may be inferred that there was a time when this growth was not malignant. Of course, it is impossible to estimate how long it had been present before the symptoms were brought on by secondary ulcerative changes. Still, the time elapsed is unusually short.

In a series of eighty-nine partial resections of the bladder for cancer,¹ there were but eight in which the time from the beginning of the disease was as short as from one to six months. Other cases of short duration of symptoms previous to operation are reported from the Mayo clinic; one case of five, one of six and one of seven weeks. The amount of infiltration present in my case was also remarkably slight. Whether we shall ever be able to recognize these growths in a precancerous stage, or rather recognize bladder conditions which may give rise to them, remains to be seen; certainly it is a strong incentive for early investigation of urinary symptoms.

TREATMENT

At present, the only treatment is surgical; in the early cases, complete removal, in the more advanced, some form of palliative operation. The intravesical operations are unsuited to this type of growth with the exception that relief from hemorrhage and other symptoms has been reported in some of the advanced, fungating cases by use of the high-frequency current.

The results of surgical treatment of the bladder by means of the suprapubic route have been notably unsatisfactory and disappointing in the past. Rafin reports ninety-six cases of partial resection for cancer by this method with a mortality of 21.8 per cent. In fifty, in which the end-results were known, there were but five reported cures of over three years' duration, only 10 per cent., and a high mortality. In regard to this seemingly high operative mortality, I think we may safely infer that this series probably included cases which on account of their advanced, local or poor general condition were poor operative risks. Of course, the increased difficulties of operating through a small space may have contributed no little to the mortality.

Transperitoneal cystotomy is now on a well-recognized basis, having been performed a number of times for various types of bladder tumor with excellent immediate operative results, occasionally in the presence of an acute bladder infection. This latter condition, while not a definite contra-indication, is, of course, undesirable and must increase the gravity of the operation. A moderate bladder infection is undoubtedly present in the great majority of the cancer cases.

As yet there have been but few cases of transperitoneal cystotomy for cancer reported. I am indebted to Dr. J. G. Thomas for the following figures from the Mayo clinic. They have operated on twenty-nine patients by this route since 1907 with the following results: There were three operative deaths, one from nephritis, one from extravasation after an extensive resection and

one from intestinal paresis. There were nine remote deaths, the time varying from two to forty-seven months in six of them; in the other three the time was not stated. One patient was not heard from. Sixteen are reported as being well at the present time; of these, three were operated on five years ago; two, four years ago; two, three years ago; three, two years ago, and six, one year ago. In this series, which included a case of extensive resection, it will be seen that the operative mortality is almost 10 per cent.

That transperitoneal cystotomy is the operation of election for all cases of cancer of the bladder in which radical cure may be attempted, except those so extensive as to require total cystectomy, is borne out by the following facts:

1. The bladder may be freely opened. As the majority of these growths occur at the base and on the lower lateral walls they are more readily accessible.

2. If the ureteric orifice is involved, which is not infrequently the case, reimplantation of the ureter can be more easily accomplished.

3. The entire thickness of the bladder wall may be resected without handling the growth.

4. The operative mortality is low.

The technic of transperitoneal cystotomy is well known. In this connection there are but one or two points that I wish to make. One of them is the advantage of placing three or four sutures about the growth in such a way that the landmarks will be preserved and the bladder wall steadied and that the growth may be excised between these points with a good margin of healthy tissue without being handled. If the growth is in close relation to the ureteric orifice, a ureter catheter *in situ* will be of great assistance. If the resection has been extensive it is my opinion that the bladder had better be put at complete rest for a while. This is, I think, best accomplished by extraperitoneal suprapubic drainage. Infection, which is particularly undesirable in these malignant cases, is much less liable to occur by this method than when urethral drainage is used, although the in-lying catheter may have to be employed later on to hasten the closure of the suprapubic wound. With proper technic in walling off the intestines and careful suture of the bladder, drainage of the peritoneal cavity is not necessary.

A patient recently operated on in the genito-urinary service at the Massachusetts General Hospital illustrates very well some of these points. The only drainage employed, with the exception of a small rubber tissue wick in the prevesical space, was a suprapubic tube, which was removed on the fifth day. On the twelfth day a catheter was put into the urethra, which remained three days. After the fourteenth day there was practically no leaking from the wound. The patient left the hospital twenty-three days after the operation.

Should the growth involve both ureters or be so extensive as to require total cystectomy, the two-stage method proposed by Watson should be employed. This consists of a preliminary bilateral nephrostomy, thus permanently diverting the urine, the cystectomy being performed at a later date.

There is another class of patients, however, who at the time they present themselves for treatment are clearly unfit for an attempt at radical cure, either because of the extent or immobility of the growth or because of their poor general condition. Just what form of palliative treatment should be adopted must be decided by the individual indications.

1. Rafin: Tr. French Urological Assn., 1905.

Dr. H. Cabot² divides these cases into two general classes:

1. Those in which operations can be undertaken early before infection has taken place and in which, therefore, there is the possibility of prolonging life.

2. Those in which operation is undertaken after extensive infection has occurred and in which operation is purely for the relief of symptoms.

In Class 1 it would appear that palliative treatment is of value and will prolong life under the following conditions:

1. When the disease is in a comparatively early stage, although the location or depth of infiltration makes radical cure impossible.

2. When infection of the bladder is slight or entirely absent.

3. When infection of the upper urinary tract is absent. Cases in which the disease has extended beyond the bladder will not be benefited. In general, the operation consists in the removal of the mass by curet and cautery, and in an attempt at a prompt closure of the suprapubic wound.

In Class 2 the treatment consists in simple suprapubic drainage, which will relieve the distressing symptoms of the later stages of the disease.

Cases will occur at times in which it will be impossible to tell previous to operation whether or not a radical removal can be attempted. Under these circumstances an exploratory suprapubic cystotomy should be done and the growth examined as to its extent and mobility; then if radical excision seems advisable it can be done by extending the operation to the transperitoneal route. It is evident that the only hope of obtaining good results in the treatment of this condition lies in early diagnosis.

Notwithstanding the fact that the symptoms of bladder tumor are exceedingly irregular much may be accomplished by attention to early, and to some seemingly, trivial symptoms. The importance of these early urinary symptoms is well recognized by genito-urinary surgeons, but that their importance is not generally recognized is shown by the long-continued treatment of the bladder for "cystitis," so often seen in cases of renal tuberculosis and a variety of other extravescical lesions.

When we know that a slight hematuria of short duration may mean so serious a condition as cancer of the bladder, it is our duty to point out as strongly as we can the importance of investigating all cases of symptomless hematuria. Then, and then only, may we hope to attain better results in the operative treatment of cancer of the bladder.

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RESULTS IN THE TREATMENT OF TUMORS OF THE URINARY BLADDER *

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The surgical treatment of tumors of the bladder is surrounded by a host of difficulties. Chief among these are to be mentioned, first, the importance of preserving the anatomic relationship; second, the complications

arising from the multiplicity of tumor types, and third, the inaccessibility of the lesion.

The anatomic relationship must be preserved in order to maintain function. It is necessary to preserve the orifice into the bladder for the ureters and, if one or both of them be destroyed, one or both of the ureters must be transplanted so as to enter the bladder at some other point. It is also necessary to maintain the normal outlet with its muscular mechanism and power of urinary control.

While most tumors of the bladder are papillomas, they occur frequently in multiple form. Usually there are one large and several small tumors. The large tumor is apt to overshadow the smaller tumors, one of which may easily escape notice. Recurrence of papillomas is seldom local, but is often seen in a different quadrant of the viscus. Cells brushed off in removing the tumor are prone to engraft themselves on any tissue with which they come in contact. Recurrence as a fringe about the orifice of the urethra is also common, and this is probably explained by cells which have been left free in the bladder and which were forced against the mucous membrane at this point by the contractions of the organ. Too much emphasis cannot be laid on the importance of a careful search of the entire floor of the bladder for minute papillomas after the large tumor has been removed, and of the importance of the complete removal of all cells adjacent to the large and small areas of neoplasms.

A large percentage of the tumors of the bladder occur in the base or on the wall close to the base at or near one of the openings of the ureters or of the urethra. These positions render the lesions extremely inaccessible to the surgeon, and make their treatment most difficult with a high percentage of recurrences.

Up to the present we have examined in our clinic 114 cases of primary tumors of the bladder. Eighty-four were in males and thirty in females. One patient was under 10 years of age, and one over 80. The greater number were between the ages of 40 and 70; the average age was 53.1 years.

We have classified these tumors, according to the clinical course, into benign and malignant. In the group of benign cases are included fibromas and myomas. Only two of the 114 cases in our series belonged distinctly to this group, and these were fibromyomas. In the group of malignant cases we have included papillomas and carcinomas.

Estimated from a clinical point of view, all papillomas are malignant, though one type of papillary tumor may be histologically malignant at the onset while another type may early show no evidence of invasion of the surrounding tissues. All types of papilloma have the power to recur and also to destroy life, in the same manner as the recognized malignant tumors. In all probability if the patient lived long enough all papillomas would become histologically malignant.

In twenty-two of our cases more than one-half of the bladder was involved and in four it was completely filled with the tumor.

METHODS OF TREATMENT

The method of operative procedure and treatment must be determined (1) by the general condition of the patient, (2) by the cystoscopic findings. Arteriosclerosis, renal insufficiency, myocarditis, etc., are factors contra-indicating radical procedures. Bimanual examination by vagina in the female and by rectum in the male is most important in the diagnosis, as thus we may

2. Cabot, H.: Tr. Am. Assn. Genito-Urin. Surg., 1907, II, 301.

* Read in the Symposium on Treatment of Tumors of the Bladder in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912