

Carcinoma of the bladder / by Gilbert Barling.

Contributors

Barling, Harry Gilbert, 1855-1940.
Royal College of Surgeons of England

Publication/Creation

Birmingham : Printed by Hall & English, 1890.

Persistent URL

<https://wellcomecollection.org/works/eemgxxpe>

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

Tracts 1809

(1)

Carcinoma of the Bladder.

by

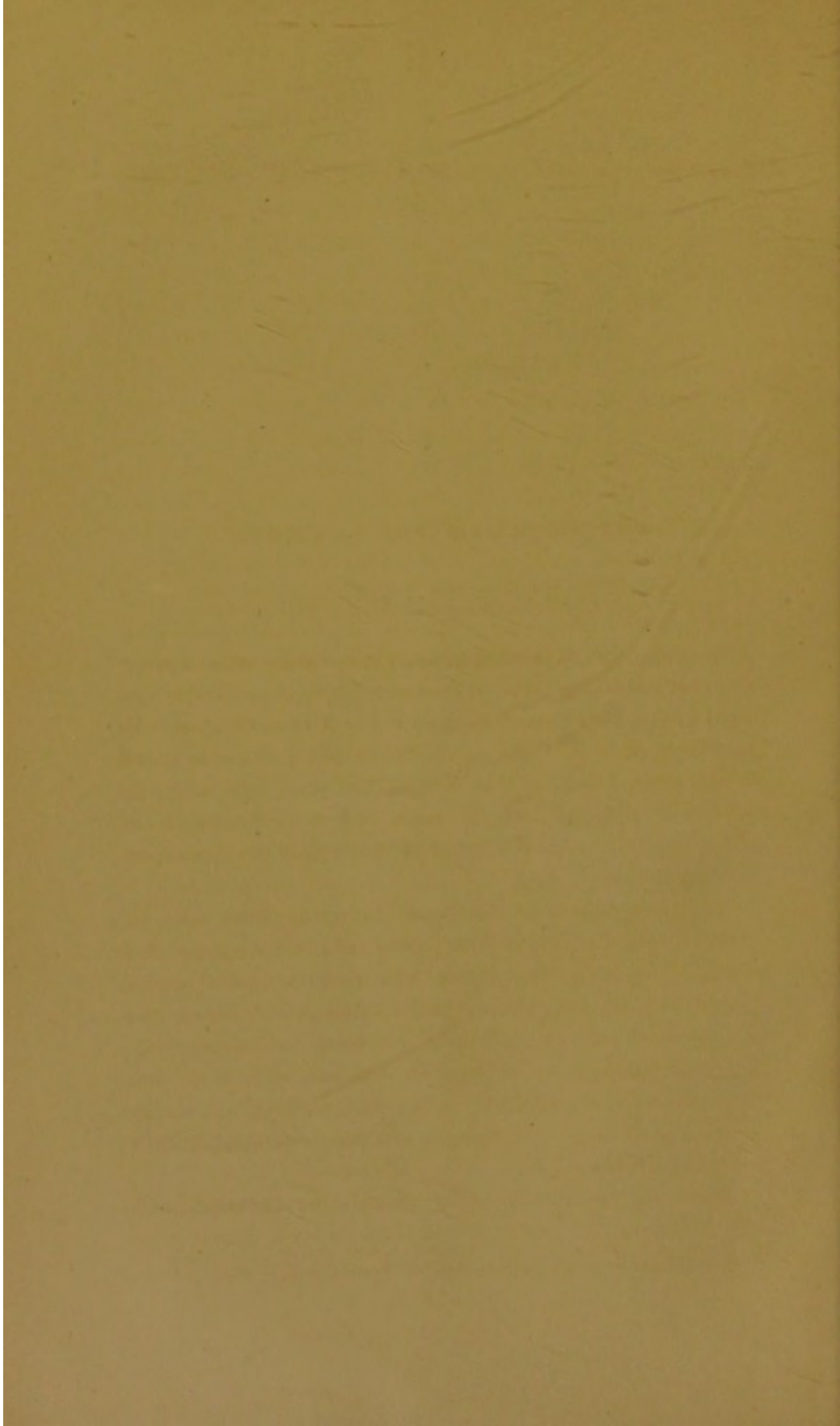
Gilbert Barling

FROM THE

BIRMINGHAM MEDICAL REVIEW.

1890 VOL. XXVII.





Tracts 1809 (1)

(Reprinted from the *Birmingham Medical Review*, Mar., 1890,)



CARCINOMA OF THE BLADDER.*

BY GILBERT BARLING, M.B., B.S. LOND., F.R.C.S. ENG.
ASSISTANT SURGEON TO THE BIRMINGHAM GENERAL HOSPITAL.

Mr. President—I propose to bring under your notice some of the more important points in connection with the pathology and treatment of this disease, especially with regard to the possibility of its excision. To some extent my remarks form a supplement to the paper I read at this Branch two years ago, when the questions I wish to elucidate to-day had to be dismissed with scant consideration, that I might not make my paper unwarrantably long.

Malignant disease of this organ has great claims upon our consideration, for I think here, more than in almost any other region of the body, the surgeon has confessed himself helpless to cure and very little able to palliate the miseries of his patients. It is however wise to examine our position in this apparently hopeless condition to see whether, with our better methods of diagnosis and our advances in wound treatment, we are not inclined to sit down with folded hands when we might do something to help our patients.

Before we are able to justly estimate the advantage to be

* Read at a Meeting of the Birmingham and Midland Counties Branch of the British Medical Association, held on November 14th, 1889.

and indurated border ; sloughing masses not yet completely separated are seen clinging to the surface ; or it may exist as a raised patch with shreddy or papillary surface, the thickest part being at the centre, the indurated edge and ulceration being absent. Rarely there may be no distinct tumour, but hard discrete nodules scattered over a limited area of the mucous membrane. Whichever of these conditions prevails the attachment to the mucous membrane is nearly always sessile.

The site involved varies in extent from the size of a florin to the size of the palm of the hand, or the growth may be diffused over almost the entire cavity, but it most commonly comes under observation as a patch about three inches in diameter — that is, in fairly advanced cases. A few tumours are described as having a broad base, but this practically means that they are sessile, for it does not appear as though the raised part of the growth was so expanded in any of these as to present a distinct contrast to a narrower base. In only one case, published in the University College Hospital Report for 1885, is a broad pedicle mentioned. The patient had suffered from hæmaturia for nine years, and, *post mortem*, the coats of the bladder were found to be thickened by growth. The pedunculated condition was probably due to the tumour being originally a papilloma, which after a time underwent malignant change. The frequency of ulceration at the surface has already been mentioned, but in not a few cases the surface is villous or papillary, the processes being from a quarter to three-quarters of an inch, and so obscuring the condition of the growth, as possibly to lead to mistake as to its real nature. Of forty-five cases where this point is alluded to, fourteen are spoken of as villous or papillated, apart from those whose surface was shreddy from partial destruction of the tumour.

In all forms of carcinoma, as indeed in most of the other tumours, though not to the same extent, deposits of phosphates occur on the surface of the growths with some frequency, and occasionally these salts may aggregate into a calculus of considerable size, lying on and partly enveloped by the superficial

parts of the tumour. The recognition of these by the sound may cause the co-existence of a growth to be overlooked.

If the bladder be divided into three segments, at least two-thirds of the epitheliomas will be found to have commenced in or to have involved the lowest segment, whilst a few will be found diffused over nearly the whole mucosa, and rarely is the growth limited to the vertex.

The exact sites mentioned most commonly are the base, or the base and the lateral walls, the trigone and its neighbourhood, or rarely the posterior and anterior walls, either one or both being involved. Before examining the diffusion of epithelioma in the glands and distant parts, the arrangement of the lymphatic vessels of the bladder must be briefly alluded to.

Some years ago these vessels were described as forming two sets, the one taking its origin in the mucous membrane, the other beneath the peritoneum. Hoggan, in an excellent paper in the *Journal of Anatomy and Physiology*, April, 1881, corrected these erroneous ideas, and demonstrated the existence of only one set of vessels over the whole bladder except at the trigone. This single layer he describes as commencing on the deep or mucous surface of the muscular coat, and in the substance of that coat, beginning as loops or chains around the smaller arteries or veins, as though corollaries of these and as destined to absorb their exudations rather than those from the mucous surface. These lymphatics concentrate into two main sets, one going towards the neck of the bladder, the other towards the urachus, and they are described in the text books as emptying into the internal iliac glands; but Hoggan speaks of this dictum as incorrect and insufficient, without however giving a more correct one.

At the trigone, however, there is a second set of purely collecting lymphatics arising in the mucous membrane and communicating with the deeper set. This arrangement of the lymphatics has a most important influence upon the infection of the lymphatic glands in all the carcinomas, for it will be

found that many of them run their full course without contaminating the glands at all, or if infection does occur, it is very tardy.

For determining the frequency of local extension and of secondary infection only 26 cases of epithelioma are available, no complete *post mortem* being recorded in the others. In only three of these is there mention of extension to neighbouring parts, once to the vena cava and twice to the tissues of the pelvis, no further particulars being given.

In eleven cases out of twenty-six, or in about 42 per cent. secondary deposits were found either in the lymphatic glands or in some distant part of the body, but it is curious that in only one instance were glandular and general infections associated. Possibly, however, more careful examinations in the future will shew glandular infection to be more frequent, as has been demonstrated in epithelioma of other parts of the body when attention has been specially directed to this point.

The glands were infected in six cases as follows—three times the lumbar, twice the aortic, once the iliac as well as the aortic, and once the abdominal. General infection occurred also six times, thrice in one or both kidneys, once in the lungs and liver (the lumbar glands being also involved), once in the lung only, and once in the radius only. How long elapses before secondary infection occurs after the growths have once started is to some extent conjectural, but it is almost certain that it does not happen until a late period. Symptoms may point to the existence of an epithelioma for two to three years or even longer, and yet a careful *post mortem* reveals neither glandular nor general contamination. It is equally true that after a few months symptoms only, both forms of secondary invasion may be found, but it is quite certain that a growth may exist and arrive at considerable magnitude without any clinical evidence of its presence, so that it would be misleading to date the origin of all tumours from the commencement of symptoms, and equally misleading to conclude that secondary invasion may occur in a few months.

What is the average time epithelioma of the bladder exists

before destroying life? It is only possible to determine this imperfectly, because the time at which symptoms commence does not always correspond with the origin of the growth, hence we have the most diverse periods before us, varying from a few months to as many years, but the mean period seems to be about three years, when the course of the tumour is not interfered with by operation.

As do other forms of bladder tumour, epithelioma attacks males much more frequently than it does females in the proportion of nearly five to one. The age most commonly affected is from 50 to 60; between 40 and 50 and between 60 and 70 there is nearly the same liability, but a better idea of the influence of increasing age is arrived at by putting the three decades together, when it is seen that thirty-five cases, out of a possible thirty-nine, occur between 40 and 70. The youngest patient was 28 years old.

In discussing the alveolar carcinomas it will not be necessary to do so at such full length as the details of the epitheliomas required, partly because of their inferiority in number and partly because there is much in common between the alveolar and the non-alveolar growths.

Whilst at times the use of the term encephaloid or scirrhus is convenient, yet often neither is applicable owing to the mixed characters of many alveolar carcinomas. The general character of each, however, may be briefly described as seen in a typical specimen. The encephaloid variety forms a large soft mass of growth which nearly fills the bladder cavity, into which it projects very prominently, and the walls of which it infiltrates over a wide patch. Its surface is shreddy and ulcerated, but there is not the amount of destruction frequently seen in the epitheliomas. The tumour may attain to the size of the two fists, and on section it is soft and pultaceous.

Scirrhus, on the contrary, does not exist as a distinct tumour mass, but is found as an infiltration of the coats of the bladder, thickening these greatly and pretty uniformly, diminishing the cavity of the organ and rendering it indistensible. The surface

may be nodular or even slightly papillary, but it is generally free from ulceration.

Of the twenty-seven alveolar carcinomas collected for the purpose of this enquiry not more than five are characteristic specimens of scirrhus, and only ten are worthy of the name of encephaloid, thus leaving twelve unappropriated.

As a rule alveolar carcinoma involves a wide area of the bladder walls. A pedunculated origin has been described in two cases, one was probably a papilloma which had become carcinomatous (Barton, *Dublin Medical Journal*, 1881), and the other, reported by Pousson, was associated with some smaller masses which were sessile.

The locality most often affected is the base, and with the inferior third of the bladder at least three-fourths are connected, if they do not originate there. An instance of an unusual site is specimen 2427 in St. Bartholomew's Hospital Museum, where the growth is situated on the anterior wall, but it is doubtful whether it could be completely removed without trenching upon the commencement of the urethra. H. Fenwick has published, in the Pathological Society's Transactions, 1887, a case of encephaloid carcinoma of the bladder in which the growth was attached to the vertex, and I have recorded a case of scirrhus carcinoma in the same situation (*British Medical Journal*, vol. ii., 1888).

Only once is mention made of perforation of the bladder coats by an alveolar carcinoma. Extension of the growths to neighbouring parts occurred only three times in fifteen cases where a complete examination was made after death; once this was to the urethra, once to the vesiculæ seminales, and once to the innominate bone. In the same 15 cases secondary formations were found nine times, that is in 60 per cent., which is a decidedly higher rate than in the epitheliomas; moreover, in five of the nine both glandular and systemic infection had occurred. The glands involved were the iliac twice, the mesenteric twice the sacral once, the lumbar once, the "abdominal" glands once.

The viscera infected were the liver five times—once in association with the peritoneum and once with bones—the kidney once, and the skin and dura mater once. Without doubt secondary infection occurs earlier in alveolar than in squamous celled carcinoma, for whilst the average duration of life from the commencement of symptoms in the former is probably less than two years, in the squamous formation it is three years; yet we find a higher rate and a more extensive diffusion of secondary invasion in the alveolar growths. As with the epitheliomas so with the alveolar tumours; more of them arise between the ages of 50 and 60 than in any similar period; whilst between the fortieth and seventieth year, sixteen out of nineteen were produced. The liability of the male sex to be attacked rather than the female is as great as in the epitheliomas.

Before dismissing the pathological questions altogether, it is necessary to recall the fact that carcinoma of the bladder gives rise to those dilative and suppurative changes in the kidney so commonly due to anything which interferes with the functions of the organ. I find in 49 cases of carcinoma, when the condition of the kidneys is described, that 33 suffered from hydro or pyo-nephrosis or from both combined. Rarely calculus in the kidney accompanies a tumour in the bladder, but the association is probably an accidental one. It has been suggested that renal calculus may have some influence on the production of carcinoma of the bladder, as calculus in the gall bladder has been surmised to have on the formation of carcinoma of the liver; but the analogy is a false one, for the conditions are reversed—here the stone is in the secreting organ and not in its reservoir.

This leads up to the question of etiology, on which there is not much that is definite or certain to be said. The most important factor in the production of almost all forms of bladder tumour is age. Setting aside those rare growths, the fibromyxomas of childhood, the large majority of all others develop between the 40th and 70th year.

Remembering, then, the special liability of the male sex to growths in the bladder, and the frequency with which that sex is affected by stricture, enlarged prostate, cystitis, and stone during the period above mentioned, the importance of continued irritation of the bladder walls as a factor in the production of vesical tumours is obvious.

When an attempt is made, however, to define a sufficient cause in each individual case, it generally results in failure. In less than 5 per cent. of all the patients suffering from vesical tumour does calculus co-exist, excluding such stones as were probably produced secondarily.

Stricture occurs even less often than stone as a complication, but enlarged prostate is more frequently present, judging from museum specimens.

The constant impinging of a catheter on a particular part of the mucus of the bladder appears to have produced an epithelioma in one case described by Hilton Fagge (*Path. Soc. Tran.*, v. 28). A similar cause may have been at work in at least one other instance, but in no more.

Diagnosis.—I do not propose to discuss at length the diagnosis of carcinoma of the bladder, but I particularly wish to draw your attention to two or three points.

The first is, that in the early days of vesical tumour it is often extremely difficult to arrive at a correct conclusion as to its innocency or malignancy from the symptoms.

It has been commonly taught that painless hæmaturia is characteristic of papilloma, and that carcinoma rarely first indicates its presence in this way, but generally by pain and frequent micturition or by obstruction. I am convinced from the observation of numerous cases that this is incorrect. The first, and for some time the only symptom of carcinoma, may be intermittent painless hæmorrhage, which is quite indistinguishable from that produced by papilloma. In 64 cases of carcinoma I find hæmorrhage to have been present in 55, whilst in 47 it was the *first* symptom. I lay stress upon this point because, not infrequently, the bladder is opened with the expectation of

finding a papilloma and the growth turns out to be malignant, the operation resulting in discredit to the surgeon and in disadvantage to the patient, unless it is done for some urgent necessity, such as bleeding which threatens to put an end to life. It is also worth while emphasizing the fact that fragments of growth, whilst at times giving most valuable indications, may at times be misleading.

Twice in the present year I have examined particles of tumour, passed by the urethra, which gave no evidence that they were derived from malignant growths, but in both cases fragments passed subsequently showed the structure of squamous-cell carcinoma. In another case a fragment of tumour was sent me by Dr. Saundby. Examination of the first two or three sections suggested that it was only derived from a papilloma, but yet another section shewed a patch which was unmistakably carcinomatous. So it was with a fragment derived from a patient seen with Dr. MacVeagh, of Coventry.

I am strongly of opinion that the most certain means of differentiating between innocent and malignant tumours is by the use of the cystoscope. The presence of a pedicle in some cases, the delicate papillary tufts even, if the growth be sessile, and, generally, the solitary condition of the tumour point strongly to papilloma.

In the case of a carcinoma, the sessile attachment, the nodular appearance, the puffy œdematous condition of the mucous membrane around, and in some cases ulceration, all help to make up a characteristic picture. Increased experience in the use of the instrument makes me rely more confidently upon it for differential diagnosis in all cases when a clear medium can be obtained to examine in.

My main purpose to-day is to place before you the arguments for and against excision of carcinoma of the bladder, to relate briefly such work as has already been done in this direction, and to give certain conclusions I have arrived at.

The arguments for and against excision have many of them been already mentioned in the pathological description, and will be recurred to later.

Of operations already performed in this direction, only four are known to me in which a formal resection of the bladder walls has been made with the intention of effecting a radical cure of cancer; in one other case a large portion of the bladder was removed accidentally in an ovariectomy, and in addition there has been a certain amount of experimental work performed on animals with the view to shewing that resection is feasible.

The four cases of resection for malignant growth are as follow:—

Case 1 (by my friend Mr. Bruce Clarke, who has kindly told me some of the details).—The patient, an elderly man, suffered from very severe hæmaturia, to relieve which supra-pubic cystotomy was performed, and the growth touched with the actual cautery. The tumour, an epithelioma, was at the vertex of the bladder, but the patient having assented only to this lesser operation and not to resection, nothing further was at this time attempted. A few days later, the patient then consenting, the growth and a piece of the bladder walls, about 3 in. by 2 in. and including the whole thickness, was excised. The operation involved a considerable piece of the peritoneum, and was very difficult owing to the contracted state of the bladder, which was completely drained by the previous cystotomy. The greater part of the wound was closed by suture, and a tube was secured in its lower angle. Death took place in a few days, but not from peritonitis.

Case 2.—Sonnenburg's patient was a female aged 60, in whom the finger detected a growth the size of a five mark piece in the anterior wall. Supra-pubic cystotomy was performed in the usual way, and it was then found necessary to remove about two-thirds of the bladder, as the tumour was much larger than it appeared to be by digital examination; indeed only "an inconsiderable part of the bladder, consisting of part of the posterior wall and the trigone," was left. The peritoneum was extensively injured, and the operation was very difficult. It was impossible to suture the whole of the wound, so only the peritoneal part was closed, and the cavity was drained by the

urethra as well as above the pubes. For a time the patient did exceedingly well, but died at the end of a month of exhaustion apparently. *Post mortem* examination shewed that there was a considerable bladder cavity. (*Berlin Klin. Woch.*, 1884.)

Case 3.—Antal's patient was a very debilitated man, aged 51, in whom a tumour the size of a fist was felt bi-manually. The bladder appeared moveable, and the glands not enlarged. At the operation (supra-pubic cystotomy) bladder and rectal distension were both employed, but there was only an interval of a third of an inch between the pubes and the reflection of the peritoneum; this layer was therefore stripped off, and the bladder opened by a "funnel-shaped incision." The finger found the growth, the size of a child's fist, attached to the vertex, and believing it to be malignant Antal determined upon resection. More of the peritoneum was therefore stripped back from the vertex of the bladder, and about one-third of the whole organ was removed, without opening the peritoneal cavity. Seven vessels required ligature, and the wound in the bladder, as in the abdominal wall, was closed with suture, except at the lower angle, where two drainage tubes were introduced. For six days permanent irrigation with thymol was maintained, the tubes were removed on the twelfth day, and the wound was healed on the fifty-fifth day, the patient being then able to hold his urine for three or four hours.—*Cent. für Chirurgie*, 1885.

In response to an enquiry Antal very kindly informs me that his patient returned with slight recurrence six months afterwards, and died a year later.

Case 4.—Guyon having had a death from peritonitis after the ordinary method of resection from "without inwards," in which all the coats of the bladder are necessarily involved, determined upon attempting excision from "within outwards." He put this into practice on a male patient, aged 55, in whom, besides the symptoms of bladder tumour, there was felt bi-manually some thickening in the right lateral segment. Supra-pubic cystotomy was performed in the ordinary way, and the growth

recognised on the right lateral wall near the bas fond ; its base was the size of the last joint of the thumb, and was surrounded by an infiltration of about 1 c.m. wide.

The mass was seized with forceps and drawn upwards and then excised, leaving a basin-shaped surface, the mucous membrane being thus removed to a greater extent than the other tissues. The wound was closed with six points of catgut suture and the patient recovered. In the pathological part of this paper reference was made to a statement by M. Clado that a fatty layer may be found limiting the deep surface of bladder tumours ; Guyon recognised this layer in this patient and so was able to determine that he had reached the deep limit of the growth. (*Progrès Méd.*, 1887). In answer to an enquiry as to the well-being of his patient, Guyon kindly tells me that he remained well two years and died nearly four years after the operation, of a local recurrence.

In the *Arch. für Klin. Chir.*, 1883, Sonnenburg relates the following case, which is worth introducing here as bearing upon the question of excision of portions of the bladder.

In removing an ovarian tumour from a woman aged 31 a large piece of the bladder was accidentally included in the ligature and removed, only part of the anterior and posterior walls and of the left lateral wall remained, but the ureters were uninjured. It was impossible to close the opening with suture, so the edges of the wound in the bladder were stitched with great difficulty to the abdominal wall with twenty points of silk suture, and a catheter, passed through the urethra, was brought out at the wound. The right side parted from the abdominal wall and an abscess formed on that side of the pelvis, which was opened subsequently from the vagina ; the rest of the sutured wound united, the patient eventually appearing very much as though she were suffering from ectopia. Later, a plastic operation was performed to cover this in, which was so successful as to leave only a small fistula, the patient then being able to hold her urine from one to two hours.

It is not desirable here to give anything like full details of

the experimental work which has been published at great length by the various workers—Vincent, Fischer, Znamensky, and others. We gather from them that small resections in dogs may be made with very little risk, but as the part removed becomes larger, so does the difficulty of closing the wound increase, and in the same ratio the danger to life. One of Znamensky's experiments is worthy of special mention. Nearly the whole bladder was removed, the dog dying on the sixteenth day. *Post mortem* examination showed a bladder the size of a large walnut distended with urine; the ureters were enlarged to four times their natural size, and the kidney pelves were dilated. It was concluded that these dilative changes were due to the large removal of the detrusor muscles, this interfering with the expulsive action of the bladder, the pressure of the urine in the upper passages choked the excretion and brought about uræmic intoxication.

The best material for suturing appears to be silk or silkworm gut of fine size, but as to how the stitches should be applied there is some difference of opinion. On the whole, however, Lembert's suture appears to have succeeded better than any other; but when a large resection was made, it was necessary to reinforce the ordinary single row (Lembert) by a second or even a third row at some distance from the wound. Without this precaution the drag on the edges was so great as to pull them apart. Whatever method of suturing was adopted, it was found that leaking was most likely to occur at the angles of the wound, and to prevent this the suture had to be carried a short distance beyond each extremity of the wound into the undivided tissues. It was found necessary to exclude the mucous membrane from the sutures, not only because it interfered with healing if it projected between the edges of the wound, but because the suture material exposed in the bladder afforded a site for the deposit of calculus material.

However successful these experimental operations were, it must be confessed that their results do not justify the anticipation of as great success when resection of the bladder is

performed for vesical cancer in a human subject. In the dog the bladder, when distended, is a much more abdominal organ than in man; consequently, operation in the former is rendered more easy of performance. The dogs selected were healthy animals, whereas the human subjects not only suffer depreciation of their health from pain and hæmorrhage, but are often the victims of consecutive changes in the ureters and kidneys which render them very unfavourable subjects for operation.

Mr. Pitts has suggested that even more extensive measures should be adopted than those already described, either "when an innocent growth is so luxuriant that successive operations fail to keep it in subjection, or when there is distinct evidence of change in its characters, such as leads to the conclusion that it has become malignant."

Pitts has described his plan in the Clinical Society's Transactions for 1886. It is proposed first to ligature the ureter on one side by a lumbar incision and to open the pelvis of the kidney. So soon as the patient has become accustomed to this alteration the opposite side is to be treated similarly. Or, the ureters may be reached by the incision for ligature of the external iliac artery, and tied as near the bladder as possible. The end of each ureter is then to be brought to the surface at a separate opening. The bladder having thus been rendered a passive organ it is proposed either to destroy the tumour by means of caustics, through a suprapubic opening, or to do a more or less complete "extra-peritoneal" resection. Messrs. Edmunds and Ballance have an article on the same subject, and embodying much the same ideas, in vol. 16, St. Thomas' Hospital Reports.

Mr. Pitts acknowledges the difficulties besetting the treatment he advocates, and these will be briefly commented on here.

Transplantation of the ureters appears hitherto to have been performed only for extroversion of the bladder. In one case, by Sonnenburg, the tubes were fixed to the root of the rudimentary penis, and the patient did well. In all the others the attempt was made either to direct the flow of urine into the large intestine or to bodily transplant the tubes into the gut,

the result always being failure, or death from closure of the ureteric orifices.

The operation of finding and transplanting the ureters would probably be much more difficult of accomplishment in the cases for which Pitts suggests it than when done for ectopia, and the danger would be proportionately greater. Besides this, it must be borne in mind how commonly secondary renal changes complicate tumours of the bladder. If these were advanced they would probably be recognised and prove a bar to any severe operation, but in the less marked cases the indications of the secondary renal changes may be quite obscured by the changes in the urine due to the presence of the vesical growth.

The whole matter may be summed up thus:—The patient would have to submit to three serious operations, by each of which he would be exposed to considerable risk, without any certainty of being finally cured of his disease, and with the very serious drawback, if he recovered, that for the remainder of his life he would be troubled with a double urinary fistula.

In my former paper I pointed out that partial and palliative operations for malignant growth should only be resorted to in the presence of urgent necessity, so that I shall not refer to these here; nor do I propose to discuss further the proposals put forward by Mr. Pitts, which I regard at present as outside the realms of legitimate surgery.

This leaves me with three definite methods to discuss, by each of which an attempt has been made to cure radically a malignant growth in the bladder. These three methods are—the extra-peritoneal method of Antal, the intra-peritoneal method as followed by Sonnenburg, and the method of excision from “within outwards” practised by Guyon.

Before comparing the advantages of these different procedures, let me remind you of the arguments which favour excision of malignant growths here. They are, the slow development of the growths, and their very moderate tendency to infect either the glands or viscera, and the fact that the bladder is merely an organ for storage, the removal of part of which,

per se, would have no appreciable ill effect on the well-being of the organism, such as follows from the excision of a secreting viscus.

The unfavourable conditions are the tendency of the growths to affect the lower third of the bladder, so that excision of them may involve damage to the ureters, and the danger of infiltration of the urine following the considerable disturbance of parts without which an excision can hardly be effected.

Antal's extra-peritoneal method is of all three the most attractive, but unfortunately it is applicable only in a few cases, viz., in those where the growth involves the vertex or parts immediately adjacent, but, as I have already pointed out, this is a rare condition. Personally, I have had only one patient whose tumour seemed at all suitable for treatment by this plan; the case is published in the *British Medical Journal*, Vol. ii., 1888. Here the growth was a scirrhus carcinoma, but *post mortem* it was found impossible to strip the peritoneum off the exterior of the growth.

Sonnenburg and Bruce Clarke both adopted what may be called, for the sake of convenience, the "intra-peritoneal" method of excision, and death followed in both instances. This plan will be available in cases when Antal's method is impossible, but there can be no doubt as to the increased risk incurred. We have here a condition very different from what exists when an intra-peritoneal rupture in the bladder is sutured. A part of the bladder walls is excised, leaving a more or less extensive gap; closure of which by suture is very difficult and may be impossible.

The third alternative, adopted by Guyon, of excision from "within outwards," appears to have given his patient a considerable respite; but it is clear that the whole thickness of the bladder walls was not removed, and that the margin of healthy tissue around the excised portion was extremely narrow. I think the most important question for the future to decide is this: Suppose a portion of the whole thickness of the bladder towards its base to be excised, would this necessarily be followed

by infiltration of urine into the pelvic tissues if free drainage were provided above the pubes, and by the perinæum as well? Reflecting upon the looseness of the fatty tissues in front of and at the sides of the bladder, and the comparative rarity with which urine infiltration occurs here after supra-pubic cystotomy—although the parts are from the first bathed in urine—I cannot but hope we may find by future experience that it is possible to extend Guyon's procedure without exposing patients to such risks as are unjustifiable—this in the face of a disease that is inevitably fatal, and is generally a source of intense misery.

I think it will be convenient if I end my paper by formulating briefly the conclusions I have arrived at.

1.—The hope of cure by excision, of malignant growths in the bladder lies in early diagnosis, before the growth has attained considerable size, before the patients' powers have been sapped by repeated hæmorrhage, and before secondary obstructive changes have taken place in the kidneys, and before secondary growths have occurred.

2.—For those rare cases in which the vertex and its neighbourhood is the seat of growth, Antal's extra-peritoneal method should be followed, if possible. By it about half the bladder may be removed, but the greater the amount resected, the greater the difficulty in stripping the peritoneum and in subsequently closing the opening. The peritoneum is of considerable thickness here, and is apt to strip up some of the external muscular coat with it, especially if chronic cystitis has existed. The peritoneum is much more easily peeled off when the bladder is full than when it is empty. The edges of the wound in the bladder should be closed as completely as possible by suture, especially at the angles, and the reflected peritoneum must be carefully fixed in apposition to the remnants of the bladder walls. When the resection has been so extensive that the bladder cannot be closed, its edges should be stitched to the skin wound, and the bladder cavity closed, later, by plastic operation.

3.—When the intra-peritoneal plan has been followed, the peritoneal wound must be carefully closed with Lembert's suture, and the remaining part by ordinary interrupted suture. If this be not possible, the part of the wound outside the peritoneum should be stitched to the abdominal wall.

4.—Silk is the best material for suture, and it should carefully exclude the mucous membrane.