

RADICAL OPERATION FOR MALIGNANT DISEASE OF THE TESTIS.

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THE whole tendency of the modern surgery of malignant growths, especially carcinomata, has been towards more and more radical operation. The aim of the surgeon nowadays in dealing with a cancer is not only to remove widely the growth, but to remove in one piece with it the lymphatic channels which drain the area involved and the glands into which these channels empty. Good examples of the modern operations are those for cancers of the breast, uterus, and colon, but apparently surgeons generally do not recognise the necessity and the feasibility of carrying out a radical operation for malignant disease of the testis, and this is my excuse for bringing the subject forward.

It is necessary before dealing with the *technique* of the radical operation to consider the nature of the growths which occur in, and the lymphatic drainage of, the testis.

Many forms of benign and malignant growths are found in the testis, but the commonest malignant form is undoubtedly that known as a "mixed tumour." This is a true embryoma, and probably each tumour is at first benign and contains cells representative of each primary layer of the embryo. One or more of these sets of cells may undergo so-called malignant degeneration; if the

hypoblastic elements, we get a columnar-celled carcinoma; if the mesoblastic, a sarcoma; if the epiblastic, a dermoid or a growth very like a chorion epithelioma. Therefore, when the representatives of one layer have developed to the exclusion of the others, we may have a pure carcinoma, sarcoma, or dermoid, as the case may be, but as a rule, and indeed perhaps always, a careful examination of all parts of the tumour will reveal representatives of all the layers. In this way we may obviously get a most varied structure in some of these tumours as evidenced by the fact that some of them have been described as chondro-myxo-sarco-carcinomata. If we accept this view, which is that of Nicholson (1), who has done excellent work on this subject, we must look on embryomata as comprising the great majority of malignant growths of the testis, but undoubtedly, as he recognises, we may get also encephaloid or scirrhus cancer, sarcoma or endothelioma arising from malignant change in the normal cellular elements of the organ. For the purpose of operation, however, we may divide malignant growths of the testis into two large classes. The first class would comprise those tumours consisting entirely of or containing any carcinomatous elements, and the second class would consist of the pure sarcomata. In the former, and much the larger, class one would be justified in trying a radical operation, whereas in the latter class, the pure sarcomata, such an operation would be, in my opinion, unnecessary and unjustifiable. As a rule it is advisable to remove a piece of the tumour for microscopical examination in order to arrive at a definite diagnosis, but occasionally the clinical signs will serve to distinguish one class from the other.

The next point we have to consider is the lymphatic

drainage of the testis. This subject has been very thoroughly worked out by Jamieson and Dobson (2), Cunéo (3), Most (4), and others. These observers have demonstrated that the lymphatic channels (Fig. 1) from the right testis open into (a) glands lying between the vena cava and the aorta from the level of the renal veins to the bifurcation; (b) glands lying on the surface of the aorta between where it is crossed by the left renal vein

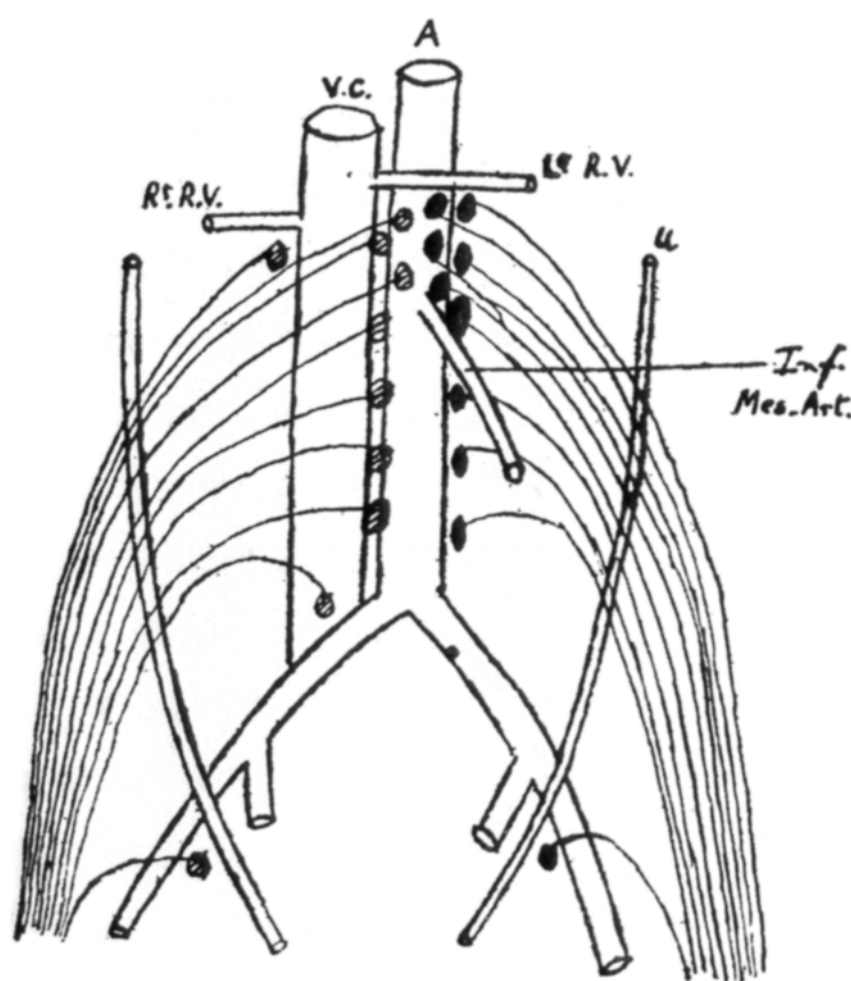


FIG. 1.

Diagram showing the lymphatic drainage of the testes (modified from Jamieson and Dobson). A., Aorta. V.C., Inferior vena cava. Rt.R.V., Right renal vein. Lt.R.V., Left renal vein. U., Ureter. Inf. Mes. Art., Inferior mesenteric artery.

and the origin of the inferior mesenteric artery; (c) a gland lying to the inner side of the external iliac artery just below where it is crossed by the ureter; and (d) more occasionally into a gland lying on the surface of the vena cava immediately above the right common iliac artery and

a gland lying outside the vena cava in the angle between it and the right renal vein. On the left side the primary glands are placed to the outer side of the aorta from the level of the left renal vein to the bifurcation and in the neighbourhood of the origin of the inferior mesenteric artery, and on this side also the gland lying in the angle between the external iliac vessel and the ureter receives efferents from the testis. The secondary glands lie along the internal and external iliac vessels and deeply between and under cover of the aorta and vena cava. As the upper members of this group lie under cover of the duodenum and pancreas and extend up as high as the receptaculum chyli it is impossible to excise them. It is, therefore, obvious that the only cases in which one may hope for success from an operation which, I think, may be called radical, are those fairly early ones in which only the primary glands are involved. It is well to note that the inguinal glands will only become involved when the skin of the scrotum has been invaded by the growth. From this study of the lymphatic drainage it is apparent that in order to carry out a radical operation on the right side it will be necessary to remove all the retroperitoneal fascia with its contained lymphatic channels and glands in one sheet, extending from the left side of the aorta to outside the spermatic vessels and from the level of the renal vein to where the vas deferens crosses the external iliac artery to dip into the pelvis. Similarly on the left side the lateral boundaries would be the right side of the aorta and the outside of the spermatic vessels, while the upper and lower limits would be the same as on the right.

Jamieson and Dobson (2) describe the extent of the operation as follows :—“ The only effective method of removing the lumbar glands would be to strip the aorta and vena cava, the common iliac vessels, and the proximal

third or so of the external iliac vessels, the upper part of the spermatic vessels on either side, and the trunk of the inferior mesenteric artery of all the cellulo-fatty tissue around and between them from the level of the renal vessels downwards." They consider that it would be only in a small proportion of cases that all the primary glands could be removed, and I quite agree with them if, as they suggest, a transperitoneal operation be undertaken; but from the excellent exposure obtained by the extraperitoneal route in the case I am about to report I am of opinion that a true radical operation can be performed in all early cases, and in this view both Howard (5) and Davies (6), each of whom has carried out an extraperitoneal operation, concur. Before deciding to carry out such an extensive operation it is only right to consider the results obtained by the older method of simple castration. Undoubtedly if these results had been satisfactory there would be no demand for a more radical procedure, but here, as in other parts of the body, the results of local operation have been most disappointing. Chevassu (7) tabulated the end results of 100 castrations, and showed that there was a recurrence rate of no less than 80 per cent. Surely such a record as this calls for improved *technique*, and justifies the routine employment of the radical operation for cases in which only the primary glands are involved. I am convinced that although the results will not be ideal, yet the recurrence rate will be greatly lowered by this means. As far as I can discover from a study of the literature the radical procedure has been carried out 13 times in all; 11 of these operations were performed on the Continent, the first by Grégoire (8) in 1905, and only 2, those by Howard (5) and Davies (6), have been reported in English. The following is the report of my case :—

CASE.—The patient, aged twenty-eight, was admitted to Mercer's Hospital, Dublin, on March 20th, 1912, having been sent up by Dr. Thomas Lyndon, of Wicklow, for operation. He stated that he had noticed a lump in the left testicle for some considerable time, exactly how long he could not say, but it was a matter of years. Some three months before admission this lump began to increase rapidly in size. He suffered no pain apart from the dragging weight of the tumour. On examination I found that the whole left half of the scrotum was occupied by a tumour some twelve inches in circumference; the surface was slightly lobulated and the consistence for the most part was soft and semi-fluctuant, with harder areas here and there. The skin of the scrotum was somewhat adherent in places. There was a hard mass of enlarged glands in the inguinal region, but no enlargement of the lumbar glands could be made out.

Operation.—A racquet incision was made, encircling the growth and extending up the inguinal canal. The tumour, with all its coverings, was first freed, and then the cord up to the internal ring, and all the fatty tissue in the inguinal region containing the glands were dissected out. Next the incision was prolonged at first parallel to Poupart's ligament and then upwards to a couple of inches above the level of the umbilicus, and deepened through all the layers of the abdominal wall down to the peritoneum. The peritoneum was stripped up off the iliac fossa and posterior abdominal wall and well retracted inwards. The vas was followed deeply into the pelvis, ligatured and divided. The next step consisted in dividing the fascia covering the psoas well to the outer side of the spermatic vessels and up as high as the renal vessels. The sheet of fascia lying to the inner side of this incision, and with it the spermatic vessels, which were ligatured close up to the renal vessels, and all the fat, lymphatics and glands, were dissected up off the muscle until the aorta was reached. The aorta was cleared from below the renal vessels down to the bifurcation. In this way the testis, cord, inguinal glands, spermatic vessels, the psoas fascia, lymphatic channels, and lumbar glands were all removed in one piece, as seen in the specimen (Fig. 2). The chain of glands along the external and common iliac

vessels was then seen to be involved and was removed in one mass. The peritoneum was then allowed to fall back into its place, the muscles were sutured with catgut, and the skin incision was completely closed except at the bottom of the newly formed scrotum, where a short drainage tube was inserted. The ease with which this extensive procedure was carried out astonished me. There was no great technical difficulty. The hæmorrhage was practically *nil*, except in the earlier stages, where the scrotal tissues were divided, and I do not remember having to tie any vessels other than the spermatics in the intra-abdominal part of the operation. The exposure of the whole field of operation was excellent. The total time of operation was an hour and a quarter. The patient was in a condition of slight shock on leaving the theatre, but he quickly reacted to routine treatment.

On the second day after operation the wound was dressed, as the patient complained of considerable pain, and it was found that the whole abdominal part of the wound was under great tension. On removing some of the stitches and passing in a dressing forceps a great quantity, estimated at over a pint, of a perfectly clear straw-coloured fluid escaped, with immediate relief of the pain. This clear fluid continued to come away in lessening quantity for several days, and was undoubtedly lymph which had been poured out by the extensive raw surface. In operating on a similar case again I would drain the deeper parts of the wound and not be satisfied, as in this case, with a scrotal drain, which was obviously insufficient. The patient made uninterrupted progress and rapidly regained the weight he had lost prior to operation. Dr. Lyndon reported in November, 1912, some eight months after operation:—"As far as your operation is concerned the man seems perfectly well."

Pathological Report.—Professor A. C. O'Sullivan kindly examined the specimen for me and reported as follows:—

"The tumour is surrounded by a capsule of dense firm connective tissue which is infiltrated in its deeper layers by small tumour masses. The tumour itself is composed partly of glandular-looking spaces, very variable in size, lined in some cases by a single layer, in others by several layers, of

cubical or columnar cells. These cells are large and the protoplasm is extremely vacuolated. The nucleus lies at the base of the cell (next lumen of space). Some of the spaces are empty, others contain blood, albuminous material, and leucocytes. The spaces are separated from one another in some places by fibrous tissue, in others by vacuolated tumour cells similar to those lining the spaces but more irregular in shape, and in some parts these cells form solid masses, the spaces being absent. The blood-vessels are elementary in structure, being usually simple endothelial tubes lying in the connective tissue. A considerable part of the tumour has undergone coagulation necrosis, the structure is visible and is as above described, but the staining power is lost. There are large hæmorrhages present. The type of the tumour is that which is usually called a mixed tumour of the testis; the structure is very like that of embryonic tissue. The inguinal, iliac, and lumbar lymph glands are enlarged, firm, and white. Many of them were examined, but in none was there any trace of metastasis of the growth. The enlargement was due to a large-celled hyperplasia with commencing hyaline degeneration."

In conclusion I wish to express my thanks to Mr. L. G. Gunn for his able assistance at the operation and to Professor O'Sullivan for the above report.

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- (4) Most. Virchow's Archiv, Band CLIV., 1898, S. 138.
- (5) Howard, Practitioner. December, 1907, p. 794.
- (6) Davies. The Lancet. Feb. 17, 1912, p. 418.
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- (8) Grégoire. Archives Générales de Chirurgie, July 25, 1907, p. 1.

THE CHAIRMAN said that in the present state of knowledge the only effective treatment in such cases was radical operation. He asked why should this extensive operation not be carried out in cases of sarcoma, seeing that in sarcoma of the

testes the lymphatic glands are usually involved, and it would, therefore, seem that the extensive operation should be done. He suggested that possibly the very free discharge referred to in the paper was the lymph returned from the lower limb, as no doubt a good deal of the channels had been cut.

MR. GUNN said he had an opportunity of seeing the operation carried out by Mr. Pringle, and it appealed to him as an excellent method of trying to relieve the severe form of disease. He alluded to the danger of recurrence, and said that in three cases in which he had removed the testes for sarcoma he was afraid recurrence had taken place. He considered that there was a difficulty to be faced in making a diagnosis of the nature of the tumour, as to whether it was a simple cystic dermoid or a very malignant form of sarcoma—the latter he was afraid was hopeless. He also mentioned that during the operation there was an excellent view of the structures to be dealt with. He inquired if since the operation was performed there had been much alteration of the abdominal wall.

MR. STOKES said that with regard to sarcoma of the testicle he had a case in a child some years ago which he at first looked on as a hydrocele, but afterwards removed the testicle. He had seen the child recently, and there was no recurrence. He would like to know how a diagnosis could be made in the early stages.

MR. PRINGLE, in replying to the remarks, said in speaking of dividing up tumours into two classes—sarcomatous and carcinomatous—for purposes of operation he did not include amongst the sarcomatous mixed tumours in which there were a few sarcomatous cells. It would not, he considered, be advisable to try the operation on sarcoma as in these tumours; although the glands were not involved, it is very likely some of the upper organs might be involved. As regards the discharge, he accepted the Chairman's suggestion. The abdominal wall since the operation is perfect, and there was no sign of hernia or any trouble of the kind. He pointed out that so far as diagnosis was concerned he advocated the taking out of a small piece for microscopic examination.

MR. SETON PRINGLE—"Radical Operation for Malignant Disease of the Testis."

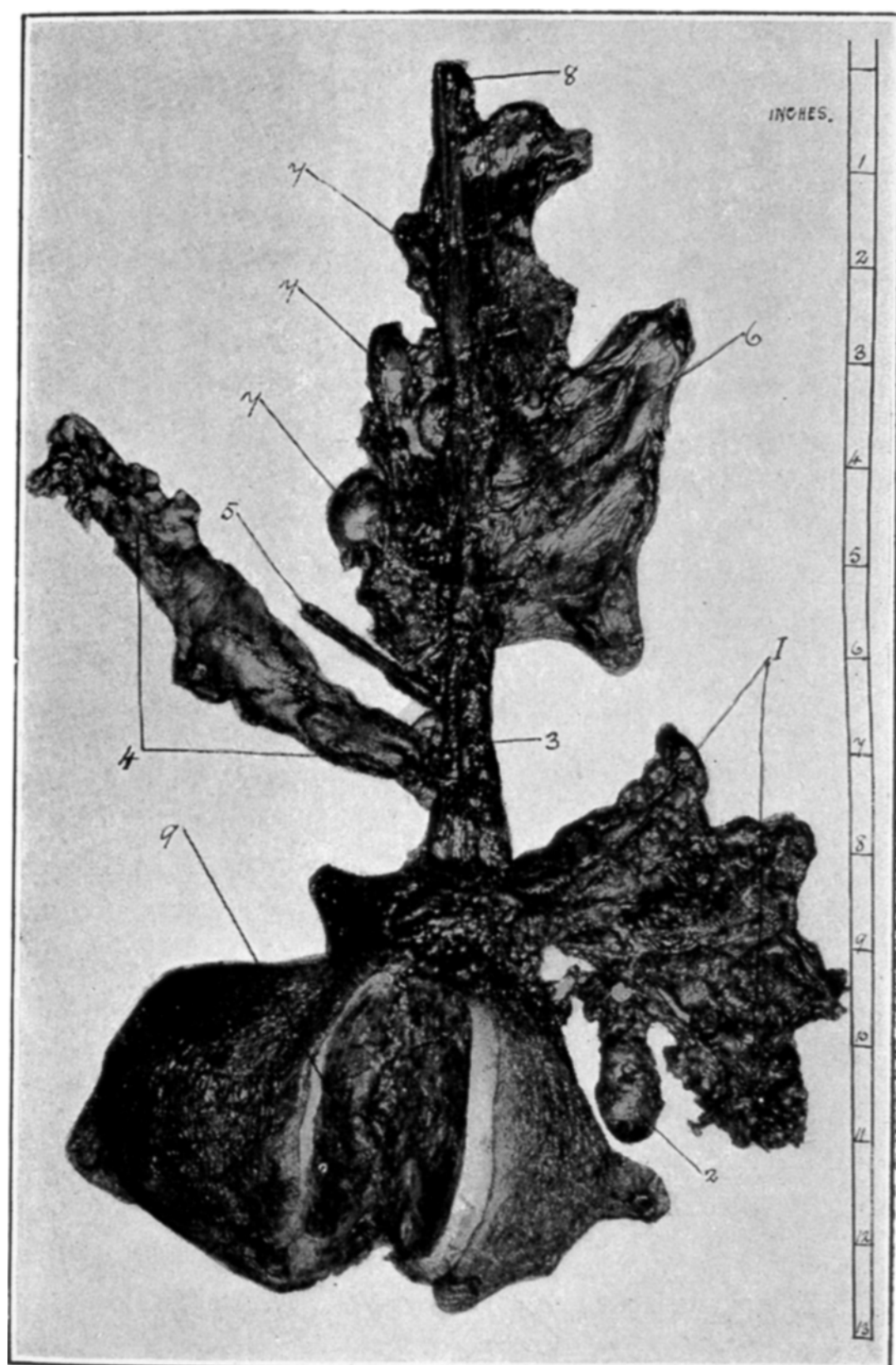


FIG. 2.

Reproduction of photograph of specimen. 1. Inguinal fatty-areolar tissue containing glands. 2. Gland from femoral canal. 3. Spermatic cord. 4. Iliac glands. 5. Vas deferens. 6. Psoas fascia and glands. 7. Lumbar glands. 8. Spermatic vessels. 9. Cut surface of tumour.