MALIGNANT DISEASE OF THE TESTIS.

WITH THE REPORT OF A CASE OF SEMINOMA, PRESENTING A PROBLEM OF Diagnosis.

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MALIGNANT disease of the testis, a condition of some rarity, always presents features of clinical interest. The case outlined below is mainly of note since the diagnosis before operation was not clear although the balance of probability inclined in the direction of malignant disease.

The patient, an aircraftsman, aged 24, was referred to me by Squadron-Leader J. E. M. Barnes on October 24, 1940. He gave me the following history:

He had had a lump the size of a cherry in the centre of his right groin since childhood. It had never caused him any pain or inconvenience nor had it entered his scrotum at any time. At his examination by a Civil Medical Board at Edgware on May 30, 1940, he had been told that it was an undescended testis. He was passed in Grade II. No mention is made in his Medical History Sheet of the reason but, in addition to the undescended testis, there was a tachycardia of 112 per minute. This was probably of nervous origin since at later examinations and during his stay in hospital he showed no sign of this condition. At Uxbridge he was examined by a medical officer of the R.A.F. in July, 1940, where again the diagnosis of undescended testis (right) was made.

Two weeks prior to my examination on October 24, 1940, he had noticed at lunch time an increasing discomfort in the right testis. On retiring at night self-examination revealed that there had been a sudden increase in the lump of considerable magnitude together with a change in its position. He was unshakable in his statement that the increase had taken place within a few hours.

There was by this time marked soreness in the groin with tenderness in the lump. During the two weeks it had, he thought, increased slightly in size, become more tender and affected his right thigh, which was the seat of dragging pain and tiredness. He had not vomited. Nausea was present when he handled or jarred the swelling. There was no abnormality in his urinary system. The bowels were regular and no alteration of daily defaecation had been noted.

There was no history of trauma, either by blow or strain; no history of venereal disease was admitted. Previous and family history were negative.

Examination.—Examination revealed a large rounded solid lump roughly 3 by 2 inches in the right groin lying under the skin over and to a greater extent below the external ring. It was not fixed to the skin or superficial tissues. Although relatively immobile nevertheless it could be moved slightly in all directions, giving the impression of being held by a tight deep pedicle. There was a small amount of fluid at its inner end but the general mass was smooth, solid and tense. It did not transilluminate. Continued handling of the tumour caused a minor degree of nausea accompanied by
some pain radiating down the inner side of the thigh. The right side of the scrotum was empty and atrophied. The left testis was normal.

There were one or two small shotty glands in both groins. Rectal and abdominal examinations were negative. The heart and lungs presented no abnormality. The pulse rate was 84 per minute.

Neither a Wassermann reaction nor an Aschheim-Zondek or Friedmann's urine test was undertaken.

On consideration it seemed that the diagnosis lay between the following conditions: (1) a haematocele; (2) a hydrocele; (3) an incarcerated hernia; (4) subacute torsion of the spermatic cord with a resultant torsion of an undescended testis; (5) malignant disease of the testis with a sudden increase in the size due to haemorrhage.

The first three conditions were only considered to be dismissed forthwith since there was no history to account for a haematocele, a hydrocele would have been translucent and a hernia would not have presented a smooth surface had its contents been omentum; it could hardly have failed to provide some intestinal symptoms had its contents been gut.

The last two conditions—torsion and malignant disease—required more thought. Although the lack of any trauma, direct or indirect, and the absence of initial nausea or vomiting was against its being twisted, yet the tenderness of the lump and its extremely rapid increase in size, from a cherry to a hen's egg, supported this contention. Further, the condition is said to be more common in an undescended testis than one in its normal position.

Finally the diagnosis of malignant disease was supported by the avowed presence of an undescended testis of arrested development. The physical properties of the swelling, with a concomitant small secondary hydrocele, were in keeping. The rapid increase in size, a point which no amount of questioning could shake the patient, was unusual for a haemorrhage. Also its change in position from mid-Poupart to the pubic region did not find a ready explanation.

In an attempt to make a pre-operative diagnosis it was finally determined that the weight of evidence favoured a condition of malignant disease with the reservation that it might well be a spermatic cord torsion. Tuberculosis and spermatic and other cysts were not even considered.

On October 28, 1940, the underwent an operation under open chloroform-ether anaesthesia and incision was made 3 inches long axially from the lower end of the swelling to a point over the inguinal ring.

A large swelling 3½ by 2½ inches consisting of an enlarged testis covered by a tunica vaginalis containing a small quantity of fluid was disclosed. The tunica was incised, a few c.c. of clear watery fluid being present. The external oblique aponeurosis was divided up to the internal ring; the cord, the vessels of which were not noticeably enlarged, was divided as high as possible between ligatures, the upper of which was reinforced by a second guard. All bleeding points having been secured, the aponeurosis was sutured and the wound closed without damage.

Despite his enforced evacuation to another hospital on the eighth day, due to enemy action, he made an uninterrupted recovery. On his twenty-first day he was discharged to twenty-one days' sick leave.

The accompanying illustration, taken within an hour of operation, shows the testis divided down its long axis. The epididymis is not visible, being posterior, nor is the cord which was only 1½ inches long. On section the
tumour mass swelled out; there were no patches of haemorrhage. The cut surface showed a strong resemblance to a fibro-adenoma of the breast.

The specimen was submitted to Lieutenant-Colonel F. J. Hallinan, R.A.M.C., Officer in charge of a Command Laboratory, who reports as follows:

Specimen.—Testis, epididymis and cord (right).
Naked Eye Appearance.—Testis 2½ by 2 by 2 inches. On section the whole of the testis seems to have been replaced by a lobulated tumour mass without cystic formation.
Microscopical Sections.—Section through centre of testis. Tissue is composed of dense strands of fibrous tissue enclosing irregular masses of medium sized spheroidal cells in loose thin stroma. These cells have deeply staining nuclei and only a thin rim of cytoplasm. Some of the nuclei show mitotic changes. These cells are arranged in loose clumps with a slight suggestion of tubule formation and in long columns permeating the strands of fibrous tissues. They bear some resemblance to the cells lining seminiferous tubules. Scattered among these tumour cells are a few giant cells containing a few faintly staining nuclei.
Opinion.—Carcinoma (seminoma) of testis.
Section Across Vas Deferens.—No sign of permeation of vas by tumour cells.
Section Through Epididymis.—Appears normal, no sign of tumour cells.

On his return from sick leave he was transferred on December 28 to an R.A.F. Hospital for continuation of treatment. He was seen by Wing Commander (now Group Captain) Stanford Cade. It was noted here that the scar was well healed. A few shotty glands were present in the left supraclavicular region and axilla. There was tenderness in the lumbar region but no mass was present. He was transferred by Group Captain Stanford Cade to the latter’s department at Westminster Hospital for prophylactic X-ray therapy to the regional lymph nodes.
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Under the care of Dr. F. M. Allchin, Physician in charge of Radiotherapy, Westminster Hospital, he underwent a course of X-ray treatment from January 7, 1941, to March 6. During this period it was found necessary to withhold treatment on account of the state of his blood, which showed very marked lymphopenia.

The areas treated were right and left inguinal regions and the pre-aortic glands from two anterior and two posterior fields. The fields were in all cases K.V. 200, F.S.D. 50 cms., with filter at first Thoræus and later 2 mm. Copper.

The skin dosage was 1,700v. units to each posterior field.

The dosage was not up to the usual figures given on account of the extreme sensitivity of the skin.

On March 7 he was readmitted to the R.A.F. Hospital for further examination. It was reported that the operation scar was soundly healed. There was no evidence of enlarged glands on abdominal examination. An X-ray of the chest showed both pulmonary fields to be normal. Following the X-ray therapy there were four areas of erythema which should subside in three to four weeks. He was transferred to a convalescent depot for twenty-eight days.

On April 12 he returned to duty, since which time he has been on full work as an ambulance driver. I saw him on May 8, eight months after the operation, when he declared he was well except for some occasional right-sided headache. Examination revealed a deep but indefinite mass to the right of and just below the umbilicus. He was due to return in one week to the R.A.F. Hospital for further examination, which has since been carried out. I have examined him again and find no mass. He is symptom free.

This case is a source of interest in two main directions—the differential diagnosis and the type of tumour.

The pre-operative diagnosis was not to be reached with ease. Malignant tumours of the testis are rare. In fifteen years of continuous surgical practice I have seen three cases; of these one had previously undergone orchidectomy and showed no signs of lung involvement.

F. J. F. Barrington [1] quotes 9,714 male in-patients admitted to St. Paul's Hospital, with only 14 cases of malignant disease of the testis, a percentage of 0.13.

Personal communications from colleagues undertaking general surgical practice show that the usual number seen by general surgeons as against those in special hospitals is limited to single figures over a span of years.

Had the tumour presented the usual diagnostic history of painless swelling of the testis with uniform rate of increase, perhaps interspersed with exacerbation due to haemorrhage, together with an absence of tenderness on examination, the diagnosis might have been reached with more certainty. The weight of the organ in this and all similar cases of undescended testis is of importance.
There seems to be some difference of opinion as to the frequency of occurrence of malignant disease in an undescended testis as against one in its normal position. Barrington [1] states that the undescended testis is the more liable, whilst J. G. Ainsworth Davis [2] questions the truth of this assertion. McCutcheon, quoted by R. E. Smith [3], reviewing the question of undescended testis in 1,656 boys over 15 years of age, found the testis undescended in 13—i.e. 0·8 per cent—whilst in the same paper Pace and Cabot stated that they had seen 3 cases of adenocarcinoma (seminoma) in 24 undescended testis. Smith concludes on his own and other statistics that the risk of malignancy is a very real one and explains that the apparent disagreement is to be found in the age at which the testis is removed. The longer the testis is left after puberty without the patient submitting to orchidectomy the greater the risk of malignancy.

Malignant tumours of the testis are divided into two groups—the embryonal type or teratoma and the adult type or seminoma. The former arise from any one or more of three primordial types of cell. Representatives of all three types are usually to be found with a predominance of one layer; thus epiblast gives rise to a teratogenous chorion-epithelioma, mesoblast a teratogenous sarcoma and hypoblast to a teratogenous carcinoma. These tumours are characterized by a more rapid rate of growth and with the occurrence of haemorrhage into the growing tumour, this latter feature being especially common in, although not by any means confined to, the sarcomatous type. There are the tumours of adolescence and young manhood occurring most commonly up to the age of 25 to 30. They are the modern names for what was formerly described as sarcoma and fibro-cystic disease of the testis.

The seminoma is a carcinoma arising from the spermatocyte or seminiferous epithelium. It is also known as a spermatocytoma. It is less malignant than the teratoma, being of slower growth and later in giving rise to metastases. It usually gives a longer history. It is the tumour of adult-middle age, usually to be found in the 30 to 50 decades. The seminoma is of more frequent occurrence, occurring in 75 per cent as compared to the teratomas 25 per cent case incidence.

This last statement has some bearing on the case described. On the grounds of age and arrested development in the organ the type of tumour to be expected would be the adolescent teratomatous type where in fact the adult seminoma or true carcinoma was found. Carcinoma can occur elsewhere in the body at all ages but the great preponderance of age occurrence is in the later decades. That a seminoma should occur at the age of 24 is just as reasonable as the finding of a carcinoma of rectum or stomach which is not uncommon in this decade. There is, however, one factor not to be found, other things being equal, in other organs, which is present in the case of an undescended testis. The undescended testis after puberty always tends to atrophy resulting in some amount of increased fibrosis. This, together with the fact that the less developed or more embryonal cells will tend to
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have a shorter life and be more readily obliterated by fibrous overgrowth in such circumstances, may explain the occurrence of this type of tumour.

I think the explanation of the sudden increase in size "from a cherry to an egg" during a period of hours is to be explained in the following way:—Despite his positive assurance that there had been no increase in size until the day of its discovery yet, in reality, the testis had been gradually enlarging for some time. Its position in the canal would allow a comparatively slow growing tumour to take the line of least resistance. The internal oblique and conjoint tendon would offer less resistance than the more fibrous external oblique aponeurosis which in this case was particularly well developed. During the morning of the day of its presentation under the skin he had sustained some trivial unnoticed strain causing it to be herniated through the external ring which had partaken of the slow dilation present in the inguinal canal. Once having left its tunnel the external ring acted as the neck of a strangulated hernia and did not allow of its return.

Treatment of malignant disease of the testis may be pursued on one of two lines. The first is by radical operation in which the testis and cord together with the glandular drainage area up to and including the pre-aortic glands are removed. This is a heroic and prolonged undertaking made through an enormous incision. It is always attended by considerable shock. The immediate results show a high rate of mortality and the late results seem no better than the second and infinitely simpler and safer procedure of orchidectomy with removal of the cord up to the external ring followed by radiotherapy. The radical operation has been abandoned by all but a few surgeons.

There is a third and by far the most important line of treatment in the case of undescended testis for which I would advance a plea. If it be accepted that an undescended testis carries with it any increased risk of malignancy, and the other be descended and normal, then surely it is logical to remove the offender. The point arises as to the optimum age for the performance of operation. After puberty the undescended testis does not usually come down. Further should it be replaced by a plastic operation the chance of its usefulness other than as a provider of internal secretion is at least doubtful. Hence I suggest that it is a rational undertaking to perform the simple operation of orchidectomy, dealing if necessary with the common concomitant, a hernial sac, in all cases of undescended testis after the sixteenth year.

Summary.

A case of seminoma of an undescended testis in a young adult is described.

The differential diagnosis is discussed particularly in relation to the curious history and clinical findings in the case.

A brief note of the pathology of malignant testicular tumours is given and the question of treatment is raised. A plea is advanced for the more
Frequent performance of orchidectomy in unilateral undescended testis at the age of 16+ on prophylactic grounds.

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REFERENCES.


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