SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

ORCHITIS, VARICOCELE, AND TWISTED CORD

BY

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The treatment of acute orchitis consists of anodynes, rest in bed, support and raising of the scrotum, with application of heat to it, and finally incision should suppuration occur, as shown by persistence of pyrexia, redness, and oedema, and by attachment of the tender lump to the skin, which becomes smooth and glazed. On incision a necrotic piece of testicle may escape with the pus, as in the following case.

Three weeks before being seen, a man of 51 had had two shivering attacks, followed by increased frequency of micturition, which was painful. Clinical examination was negative, apart from the fact that the urine was very turbid with tiny flakes. X-ray examination being negative, cystoscopy was performed eleven days later. The trabeculated and inflamed bladder held only a few ounces; the ureteric orifices appeared normal. Three and a half weeks later there was an acute left epididymo-orchitis. A fortnight later a little thick pus was aspirated. Eleven days afterwards the testicle, being no smaller, though less hot and tender, was explored. The temperature was 98° F. or less, though it had touched 100° once, two days before operation. There was some superficial pus, but none in the tunica vaginalis. On incising the tunica albuginea an abscess cavity was found containing loose necrotic pieces of testicle, which were removed, and the cavity was drained. The pus contained only *B. coli*. This was a true suppurative orchitis.

Seven months later a right epididymo-orchitis subsided after treatment by fomentations. Three and a half years after this, when the patient died following operation for perforative appendicitis with peritonitis, the notes state that the right testicle and epididymis were rather soft; the left, atrophied and soft.

The treatment of tuberculous epididymo-orchitis includes constitutional measures, tuberculin injections, orchidectomy, and possibly ligature of the opposite vas deferens. Syphilitic orchitis calls for anti-syphilitic treatment or orchidectomy, the latter being especially desirable if the diagnosis from neoplasm is uncertain. It is perhaps not superfluous to state that the preventive treatment of acute epididymo-orchitis calls for avoidance of gonorrhoea, rest in bed when urethritis is actually present, avoidance of testicular trauma, gentleness in urethral instrumentation and irrigation and in prostatic massage, and section and ligature of the vasa deferentia to prevent post-prostatectomy epididymo-orchitis.

Varicocele

When confronted with a case of varicocele it is well, before having recourse to surgery, to remember that varicocele is an affection of adolescence and young adult life, rarely being seen afterwards and tending to spontaneous disappearance; that the symptoms associated with it are usually mental rather than local; and that the testicle is imperilled more by the operation described in textbooks than by the varicocele itself.

The varicocele that is secondary to a renal neoplasm differs from the ordinary variety in its rarity (the only

example I have come across was secondary to a huge right renal neoplasm, and was seen in the Fellowship examination); in its different age-distribution, since renal growths occur usually after middle age; in its more rapid development; in not disappearing during recumbency; and in not being practically restricted to the left side. The treatment of such a symptomatic varicocele differs from that of the ordinary idiopathic type in that any treatment adopted must be directed to the causal condition in the kidney. Though usually a late symptom, such a varicocele may occur early, and, according to Thomson-Walker (1936), is not to be considered as contraindicating operation, the varicocele disappearing after nephrectomy.

Since the main symptoms of varicocele are general, and the condition is transient, it is reasonable in most cases to content oneself with reassuring the patient that the condition will not cause impotence, sterility, or testicular atrophy, although the associated testicle is usually small and flabby. One may point out that its poor quality probably compares favourably with the degenerative combination of fibrosis and atrophy which has often been noted to follow the usually described operation. In addition to reassuring the patient, one may recommend a suspensory bandage, open-air exercise, cold baths, and marriage.

The indications for surgical measures are genuine and severe local pain in a mentally stable individual, or Army and Navy regulations in candidates for those services. In fact, so few cases of varicocele seen by me have presented the above indications for operation that I have operated on only two patients.

INJECTION TREATMENT

Injection treatment of varicocele, of which I have no experience, has been recommended for large varicoceles. Points in the technique which have been advocated are that the patient should be standing; that the skin should be cleaned with an uncoloured fluid; that the selected vein should be held firmly; that care should be taken that the point of the needle is really in the vein; that the site of injection should be afterwards pinched; and that the patient should lie down for ten minutes, keeping the scrotum raised. Employing this technique in seven cases, Hanschell (1928) had no haematoma. The veins became hard and tender, and remained so for about a week. In four of the seven cases examined after three months the varicocele appeared cured, the veins could be felt as very thin hard cords, and the testicle seemed unaltered. Only one injection is required. The solution used was quinine urethane (1 c.cm. of a solution of quinine hydrochloride 4 grammes, urethane 2 grammes, distilled water 30 c.cm.). Others have used 5 per cent. sodium morrhuate (Porritt (1931a, 1931b) 2 c.cm.; McEvedy (1932) 2½ to 3½ c.cm.).

When I used to inject varicose veins in the leg the patient was made to lie down and the limb was compressed, if necessary, in order to render the veins prominent. In the standing position which has been recommended for the injection of varicoceles there is a risk of the patient's feeling faint, and the caution necessary to prevent a fall should be redoubled by recalling a recent case in which a standing patient, having varicose veins injected, fell, sustained a fractured skull, and only narrowly survived.

The ordinarily described operation of ligaturing and excising about an inch of the anterior bundles of veins, and approximating the cut ends, must almost invariably risk the involvement of the spermatic artery in the ligatures. In fact, the ligature of this artery is actually included by one authority in his description of the technique of the operation. Such being the case, it is not surprising that the classical operation, even though resulting in symptomatic relief, has in a high proportion of cases been followed by fibrosis and atrophy. Nor is relief invariable. Kenneth Walker (1923) states that persisting pain and tenderness have often necessitated secondary orchidectomy.

THE RECONSTRUCTIVE OPERATION

Dissatisfied with the ordinary operation for varicocele, Turner Warwick (1931) has described a reconstructive operation in which only unvalved veins are excised, "leaving a pampiniform plexus protected by two or three valves. . . . Valves in these channels present themselves as dilatations. The competence of any particular valve is proved by the absence of reflux of blood downward after the segment of vein below has been emptied upwards." I have not practised this operation, but in my own two cases care was especially exercised to ligature veins only. The first patient cannot be traced; the second, aged 29, whose left testicle hung about two inches below the right in a lax pendulous scrotum, was operated upon on March 7, 1938, when, in addition to resection of one anterior and one posterior varicose vein, the lower quarter of the scrotum was excised. When last seen, on September 19, there was still slight fullness of the left pampiniform plexus, but there were no symptoms, and both testicles were on the same level, felt normal, and had testicular sensation.

Twisted Cord

Roughly half the cases of torsion of the spermatic cord occur with fully descended testicles—a fact insufficiently recognized, and one which leads to these cases often being wrongly labelled epididymitis, especially since strangulated hernia is much more easily excluded than in the case of torsion with incomplete descent, where operation makes the diagnosis clear. However, the fact that in about 50 per cent. of all cases of torsion of the spermatic cord the involved testicle is incompletely descended shows that incomplete descent, which is very rare in comparison with full descent, must be a predisposing cause of twisting of the cord.

PROPHYLACTIC TREATMENT

Actually, with both complete and incomplete descent, the testicle, instead of being normally attached posteriorly, is usually suspended upside down and is free within the cavity of the tunica vaginalis, the predisposing influence of incomplete descent on such an abnormally mobile testicle in causing it to rotate being probably due to its greater liability to be affected by muscular action. Therefore, what one may call the prophylactic treatment of torsion of the cord is achieved by treatment of incomplete descent of the testicle, successful treatment of which, whether by orchidopexy, orchidectomy, or other means, must eliminate a certain proportion of torsions.

Another class of torsions which may be eliminated by prophylaxis is that of recurrent mild torsions, where timely orchidopexy between attacks will not only prevent further painful attacks, each of which inflicts some damage on the testicle, but will anticipate the final destructive attack of acute haemorrhagic torsion which is otherwise almost

certain. That it may not be quite certain may perhaps justify a waiting policy in the case of intelligent patients who learn to untwist their own torsions, though this is not a course which I would indefinitely recommend.

CLINICAL UNTWISTING

With regard to actual torsions, although spontaneous untwisting almost certainly occurs in mild cases, clinical untwisting by manipulation is the first mode of treatment to be considered. Unfortunately it is applicable to a minority of cases, since it can be performed only with fully, or almost fully, descended testicles, and then only in early cases. The surgeon is unlikely to meet such early cases, with which the general practitioner is called upon to cope. Hence the desirability of the latter's being familiar with the condition, in the diagnosis of which the factors of importance are the sudden and apparently causeless onset of pain, soon followed by swelling of the painful testicle, usually at about the age of puberty, in the absence of urethral or urinary infection. Scrotal oedema and redness and mild pyrexia soon develop, so that epididymitis is simulated.

In a recent interesting article Lambert and Smith (1938) mention that restlessness, as with colic, was a striking and often-noted feature, and that relief following untwisting was equally striking and greater than that obtained from morphine. As the twist, consisting of half to four turns about a longitudinal axis, is usually from without inwards, the rule for untwisting the cord is, while supporting the testicle, to rotate it from within outwards. (In one of Lambert and Smith's cases, in which clinical untwisting was carried out five hours after onset, the amount of rotation necessary to undo the twist was 360 degrees.) If this increases the pain, rotation in the opposite direction should be tried. Here is a useful field for the general practitioner's efforts, since untwisting becomes impossible later on. Three cases seen at hospital by me within a period of five weeks in 1927, and treated by orchidectomy, arrived respectively fifty hours, one week, and five days after the onset of symptoms. If in an early case clinical untwisting fails, operative untwisting should be immediately attempted, as there is a chance of saving the testicle and of fixing it so as to prevent further attacks.

IMPORTANCE OF EARLY RECOGNITION

The earlier these cases are seen, and the more aware general practitioners are of the condition, the greater the number of testicles that may thus be saved in the future. The fact remains, however, that in the few recorded cases of untwisting of the cord, whether clinically or at operation, the usual result has been atrophy or sloughing of the testis. Lambert and Smith (1938) record an interesting case of a doctor's son who, since November, 1932, when he was 14, has had recurrent torsion of the spermatic cord treated repeatedly and successfully by non-operative manipulation, without subsequent atrophy (up to June, 1937). But, although there may be no clinical diminution in the size of this testicle, which may retain testicular sensation, its progressive damage, in the absence of orchidopexy, is strongly suggested by my case of a patient aged 27 who was seen after fifty hours of torsion. He had had about a dozen attacks (treated as epididymitis) since the age of 14. His blue-black and diffusely haemorrhagic scrotal left testicle showed microscopically the effects of the previous twists: spermatogenesis, though fair, was localized, and areas of hyaline change and necrosis supplied further evidence of an old lesion.

TREATMENT IN CASES OF LONG STANDING

When the torsion is already of long standing when first seen, the practical choice lies between expectant treatment (with rest in bed, support, and perhaps cold applications) and orchidectomy. The former is justifiable in a mild or already subsiding attack, especially if the opposite testicle is absent or is incompletely descended. The advantages of expectant treatment are the avoidance of an operation and the preservation of the testicle, even if, as is almost certain with a tight twist of long duration, atrophy be the outcome. Orchidectomy is indicated when pain and swelling persist and when the swelling is very large. It is usually of the size of a hen's egg, but a swelling of the size of a child's head has been recorded. The following case caused some diagnostic doubt because of the patient's age (57) and the presence of fluctuation.

There had been ten days' pain and swelling of the right scrotal testicle, which was found to be tender, swollen, and fluctuating, with the skin reddened but unattached. There had been no urethral discharge but some increased frequency of micturition, and there was a history of gonorrhoea thirty-five years previously; yet the urine was absolutely clear and without shimmer. There was thought to be slight enlargement of the prostate, with a little tenderness above it. Temperature, pulse, and respirations were respectively 98°, 96, and 18. The diagnosis of probable torsion (? abscess) was made. Two days later the cord was found to be twisted, and a deeply congested and blackened testicle was removed.

The advantages of orchidectomy are the immediate disappearance of a painful swelling (facilitating an early return to work) and the radical guarantee against recurrence.

Finally, in all cases of doubt exploration is indicated, especially when the differential diagnosis from strangulated inguinal hernia is not clear, when the testicle is incompletely descended, and when a hernia coexists.

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Dr. A. Neave Kingsbury's annual report for 1937 of the Institute for Medical Research at Kuala Lumpur indicates the variety and extent of the work done in connexion with the preparation of prophylactic biological products; bacteriological, chemical, and entomological investigations; a rat virus inquiry; and serological and medico-legal activities. In the year under review cholera outbreaks among immigrants from India and China were arrested at Port Swettenham and Penang, while in September canine rabies cases had to be dealt with in Singapore following the admission of an infected dog. Filariasis was found to be a serious problem in the vicinity of the River Bernam, and to be endemic in certain areas of Perak and Pahang. Dr. Poynton estimated that about 1 per cent. of the population had elephantiasis, and that about 2 per cent. more were infected. Work on rat viruses showed that the use of a selected strain of *Streptococcus viridis* might be very effective for rat extermination, but, since it is pathogenic for man, its employment was inadvisable when there was any possibility of contamination of food or water supplies. The report contains also a survey of cholera in the Malay States during the last thirty years; spread up-river seems to have been a not uncommon direction of extension of the epidemics.

IMPERIAL CANCER RESEARCH FUND

THIRTY-SIXTH ANNUAL REPORT

The thirty-sixth annual report of the Imperial Cancer Research Fund contains the usual review of the year's work by the director of the Fund, Dr. W. E. Gye. The removal from Queen Square to the new laboratories at Mill Hill took place in July, and necessarily interfered with the programme of research, but essential routine duties, such as the preservation of standard strains of tumours, were continued without interruption. The new buildings at Burtonhole Lane, Mill Hill, include a laboratory block, animal houses, stables, and two cottages for members of the staff. The central office of the Fund is now housed in the Royal College of Surgeons in Lincoln's Inn Fields, and Mr. Kennedy Cassels has taken over the duties of secretary.

Carcinogenesis

According to Dr. Gye, it is now certain that thorotrast, which is a colloidal solution of the radio-active thorium dioxide, in small doses produces sarcomas at the site of injection in a large proportion of rats and mice. Dr. L. Foulds injected small quantities of this substance into the bases of the nipples of female guinea-pigs, and obtained at the exact site of injection one carcinoma and three sarcomas. Two of the tumours were found two and a half and three years, respectively, after injection. This long delay in a short-lived animal suggests that ten or fifteen years might elapse before thorotrast produced a tumour in man. Three of these thorotrast tumours proved to be transplantable, and the carcinoma which was one of them is apparently the first glandular cancer produced by the local action of a carcinogenic agent.

The problem of the interaction of carcinogenic substances and viruses attracts increasing attention. Experiments were carried out at the Fund's laboratories and at the National Institute for Medical Research to determine the effect on rabbits of intramuscular injections of tar and subsequent intravenous injections of Shope fibroma virus. In normal rabbits the virus produces at the point of inoculation fibroma-like lesions which always regress, usually in two to four weeks, and which are not regarded as neoplastic. In tarred rabbits regression was delayed for many weeks, and there was not only a fibroma at the site of the tar injections but also a generalized fibromatosis. One rabbit of a small series in each laboratory developed later a sarcoma at the site of the tar injection, but it has not been possible to reproduce this effect as yet. Further investigation by Dr. Foulds revealed that a single dose of tar injected about a week before the virus caused localization, while a single dose given four months previously did not. Multiple doses were rather more effective than a single dose, but the essential localizing factor was the immediate tissue reaction to tar and not the presence of tissue which, having been long in contact with tar, might be suspected of being in a pre-cancerous state.

Hormone Studies and Tissue Culture

Dr. W. Cramer and Dr. E. S. Horning have continued their investigation of the changes that follow the prolonged administration of oestrone. Such treatment leads to enlargement of the anterior pituitary with almost complete disappearance of the granular acidophil cells, degenerative changes in the adrenals, and the development of mammary cancer. This suggested the existence of a physiological antagonism between oestrone and the hormones produced by the pituitary acidophil cells, and in fact these changes were not seen when preparations containing the thyrotropic hormone of the anterior pituitary were given at the same time as the oestrone. Thyrotropic hormone was