exposed. The tumour, which lay in the same plane as the thyroid, was pear-shaped and approximately 5 by 3 by 1.5 cm. in size. It was at first thought to be a thyroid adenoma, and in fact it was felt that it might be the only thyroid tissue present, as the gland itself was not immediately obvious. This was due to the small size of the thyroid, which, however, on careful exploration was quite normal. The tumour lay immediately below the left lobe of the thyroid. Further exploration revealed no other tumour, and no obvious parathyroid tissue was seen. It was therefore decided that the tumour was probably the offending parathyroid, and removal was carried out.

Post-operative Course.—Immediately after operation 10 units of parathormone was given intramuscularly, being repeated every 12 hours. Vitamin D_2, 100,000 units, and calcium lactate, 3 g., were also given, and were continued daily. In view of the difficulties of moving the patient about the bed penicillin was given to reduce the risk of post-operative pneumonia. During the first 24 hours the serum calcium fell to 13.6 mg. per 100 ml., and then gradually to 7.9 during the following 12 days.

Two days after the operation the patient developed acute suppression of urine, only 2 oz. (57 ml.) being passed in 24 hours, the blood urea at this time being 284 mg. per 100 ml. At the end of the fourth day the blood urea had risen to 400 mg. The urinary output then increased gradually and the blood urea began to fall, eventually reaching normal four weeks after the operation. After 21 days the urine became free from albumin. Four days after the operation, following several hours of increasing irritability, the patient developed frank tetany. Calcium gluconate, 20 ml., was given intravenously, this relieving the spasms in about half an hour. The dose of parathyroid hormone was then increased to 20 units twice daily. Tetany occurred on five subsequent occasions during the next three days, and each time was controlled by intravenous calcium gluconate.

One week after the operation the patient had become much more comfortable and was free from pain. He was given a high carbohydrate diet, with iron and vitamin C added, and made an uninterrupted recovery. The most prominent features of the convalescence were the rapid relief of pain after operation and the improvement in physique, the patient gaining over 3 stone (19 kg.) in three months. Radiographs of bones taken 10 months later showed complete restoration of the normal pattern.

Morbid Anatomy.—The tumour was a well-encapsulated oval mass 5 by 3 by 1.5 cm., weighing 17.6 g. The histological appearances were those of a simple adenoma of the parathyroid.

COMMENT

The following features of this case appear to be of interest. In the first place a parathyroid tumour is rarely palpable before operation, and as a result of this it was at first thought that the tumour was thyroid tissue. It is obvious that the common reasons for this are that the adenomata are rarely as large as this and that they normally lie in situations where they are well covered by the surrounding tissues. In this case, however, it was placed more superficially than one would expect to find either normal or abnormal parathyroid tissue. Crotti (1938) states that he has noted only one case palpable before operation; and Lievre (1932), after reviewing all the literature, could find only seven cases in which the tumour was felt.

The occurrence of acute suppression of urine and uraemia following removal of a parathyroid adenoma has been noted before. Usually, however, there is radiological evidence of calcium deposition in the renal tract, a feature which was absent in this case. The pathological process is apparently a reversible one, as the urine eventually became normal and the renal-function tests performed later were well within normal limits. The rapid rise in blood urea and the subsequent fall suggested that the renal lesion was probably a lower nephron nephrosis. There was no significant change in the blood pressure.

Severe muscular pains were a very prominent symptom, and it is interesting to note that these cleared up extremely rapidly after operation. In fact, the presence of these severe pains, which were very difficult to control by any drug, was the main reason for expediting the operation.

Finally, it was noted that the control of tetany was best accomplished by the slow administration of calcium gluconate intravenously. Parathormone was given in small doses repeated fairly often, but, even so, its efficacy seemed to diminish rapidly after the first two or three injections.

We would like to thank Dr. L. Phillips for the histological report, Dr. W. S. M. Grieve for the biochemical estimations, and Mr. R. A. King, the orthopaedic surgeon to the hospital, into whose ward the patient was admitted.

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Terramycin in Pertussis

Haemophilus pertussis is sensitive *in vitro* to terramycin (Hobby *et al.*, 1950), its sensitivity being approximately of the same extent as to chloramphenicol (Wells *et al.*, 1950). It has been shown that pertussis can be modified by chloramphenicol given early in the pre-paroxysmal stage (Bogdan, 1951a, 1951b), and it was decided to investigate the effect of terramycin along the same lines. This paper reports the results obtained in a small preliminary series of swab-positive cases treated with terramycin in both the pre-paroxysmal and the paroxysmal stages of the disease.

This trial was carried out on out-patients attending the Pertussis Contact Clinic of the Westminster Children's Hospital. No special selection of cases was made apart from the exclusion of all those who had at any time been immunized against pertussis or whose cough had been paroxysmal for more than two weeks and were too advanced in their illness for assessment of treatment. The cases were divided into three groups for assessment of results. In the course of this trial, which extended over ten months, a few further cases were excluded from all three groups through failure to attend for follow-up or complete treatment.

Crystalline terramycin hydrochloride was given in an elixir or as oral drops to the younger children, and in 250-mg. capsules to the older children. The daily dosage was the same in all cases—30 mg. per lb. (66 mg. per kg.) body weight, usually divided into four doses and given for five or seven days. The seven-day course was used at the start of this trial, but a five-day course was later found to be adequate. Symptomatic treatment consisted of nasal drops of ephedrine hydrochloride (¼%) in normal saline, and a simple non-opiate linctus, and was given to the children in all three groups.

RESULTS

All the cases treated with terramycin were swab-negative at the completion of their course of treatment. Evaluation of treatment was based on cough. The paroxysmal stage covered the period of spasmodic cough, regardless of the presence or absence of whooping. The length of illness was assessed by the total duration of cough, however slight or intermittent.

Group I consisted of 10 children who were given treatment in the pre-paroxysmal stage. Seven of these, who were started on terramycin by the fifth day of symptoms, did not develop a paroxysmal stage, their total duration of cough ranging from 4 to 16 days. The three remaining cases, in which terramycin was started after the fifth day of the pre-paroxysmal stage, developed a paroxysmal stage lasting 2, 21, and 27 days. Their total duration of cough was 11, 35, and 36 days respectively. Two of the children, whose illness had been arrested, started to cough and became swab-positive again after re-exposure to infection. They had been symptom-free for three weeks with negative swab-cultures in the interval. A further course of terramycin once more successfully arrested their illness and there was no further recurrence. A third child whose illness had also

been arrested by terramycin became reinfected after a week's interval, and was not seen again until he had begun to whoop. These cases show that pertussis arrested by treatment may not be followed by immunity.

Group II consisted of 14 children treated early in the paroxysmal stage. Paroxysms continued for periods ranging from 6 to 33 days. Their total duration of cough ranged from 12 to 46 days. In one case segmental pulmonary collapse was noted after treatment.

Group III consisted of 11 cases of pertussis given no antibiotic. Four failed to develop a paroxysmal stage and their total duration of cough ranged from 21 to 40 days. In the seven paroxysmal cases paroxysms occurred for periods ranging from 4 to 31 days, and the total duration of cough ranged from 30 to 49 days.

COMMENT

These results suggest that terramycin given early in the pre-paroxysmal stage can, like chloramphenicol, modify and arrest the course of pertussis. The onset of paroxysms may be averted and the duration of the illness and infectivity is shortened. Immunity may not follow arrest of the illness in the pre-paroxysmal stage, and for ultimate protection immunization may still be advisable. These results are comparable to those previously obtained with chloramphenicol in pertussis contacts, and suggests that terramycin may be used as an alternative if its value is confirmed by more extensive trials.

I am indebted to Dr. Gladys Hobby, of Pfizer's (N.Y.), for a gift of terramycin, to the Department of Bacteriology at the Westminster Medical School for bacteriological investigations, and to the medical and research committees of the hospital for encouragement. This work was completed with the aid of the Mary Scharlieb Research Studentship of the University of London.

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Epithelioma of the Male Urethra following Injury

Primary carcinoma of the male urethra is very rare (Loughnane, 1948), rare (Bieberbach and Peters, 1929; Lower, 1931; Thomson-Walker, 1948; Willis, 1948; Riches and Cullen, 1951), or, at any rate, uncommon (Lower and Hausfeld, 1947; Nanson, 1951). Elton (1952) estimated the total cases in the literature at 198, but did not include the 15 cases of Riches and Cullen or Nanson's two. Nanson's own estimate of 189 cases also does not include those of Riches and Cullen. The total is now therefore about 215.

Despite this comparatively small total, opinion regarding the relationship between the neoplasm and trauma is far from unanimous. Thus, while Loughnane says that trauma, "an antecedent of carcinoma in other parts of the body" (unspecified), is not apparently significant in the case of the urethra, and, further, is against any relationship between the very common stricture and the rare urethral carcinoma, Goldstein and Abeshouse (1937) thought that many regarded trauma as next in importance to gonorrhoeal stricture as predisposing to neoplasm, and quoted Rizzi as finding a history of trauma in 10% of cases, and others as reporting cases antedated by perineal injury.

Nanson thought that all were agreed that post-gonorrhoeal stricture was a potent causal factor, and quotes various writers as finding stricture (either post-gonorrhoeal or traumatic) before half to three-quarters of cases. Colby (1950), however, does not mention carcinoma following injury, and doubts whether chronic irritation or urethral stricture plays a significant part in its development.

The following three cases in the literature, in which injury possibly played a part, show wide differences in the history.

Bieberbach and Peters (1929) described the case of a man of 42 in whom they found complete retention and a hard inflamed perineal swelling (without fistula) three months after a probable perineal injury. The swelling proved to be an epithelioma, and the man died five months later. In Lower's case (1931), although squamous carcinoma was found several years after a perineal injury (years in which rectal fistula, perineal incision for acute retention, and perineal fistula were incidents), he was able to remove 1½ in. (3.8 cm.) of urethra, rejoin end to end, and report the patient in good physical condition nine years later and requiring dilatation only twice a year. Although Maximow and Bloom (1948) say that patches of stratified squamous epithelium are common in the lining of the cavernous part of the urethra, Nanson postulates squamous metaplasia and possible leucoplakia behind the stricture as the origin of the malignant change. He found keratinizing squamous epithelioma in a man of 62, whose urethral difficulties had started 40 years before in a fracture of the penis at the peno-scrotal junction during intercourse; this was followed by a urethrocele, and the cancer was found in a recurrent fistula at the site of this.

In the following case death due to cachexia from urethral carcinoma occurred eight months after an incapacitating perineal injury.

CASE REPORT

A miner aged 54, of previous good health, fell heavily on November 7, 1950, when operating a machine at the coal-face. He hurt his back, and at the end of the shift complained of severe pain and swelling in the perineum. He did not work again from that day.

He was admitted to hospital on November 10, a periurethral abscess was opened, and he was discharged after 18 days in an apparently satisfactory state. He was admitted to another hospital on December 11, having been passing urine through a perineal fistula for a few days. He was catheterized and given chemotherapy, and after nine days was discharged with the note, "Satisfactory; no leakage, tenderness, or swelling."

The fistula soon reopened, and he was admitted to a third hospital on January 10, 1951, under the care of Mr. W. Irving. Attempts to excise the fistula were not successful, and on April 12 a biopsy of the sinus showed keratinizing squamous epithelioma. Spread of the neoplasm was rapid, and, the condition being inoperable, the man was discharged home on May 19, dying there on July 6, just eight months from the date of injury.

At necropsy on July 7 the body was very wasted; there were enlarged necrotic neoplastic glands in both groins; the whole perineum was widely gaping from extensive neoplasm, which had spread forwards on to the scrotum; the proximal half of the shaft of the penis was thickened and indurated, and, when an attempt was made to remove the bladder and genitals intact, it was found that neoplasm had completely eroded through the proximal part of the urethra and the surrounding tissues. Histology of portions of the shaft of the penis, external iliac glands, prostate, bladder wall, inguinal glands, and perineum showed a predominantly keratinizing squamous epithelioma.

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