EPITHELIOMA OF EXTERNAL MEATUS

A very busy otologist may not see more than five cases of this condition in his own hospital and private practice in twenty years, so this will indicate its rarity when compared with other ear affections. Biopsy is the only sure method of establishing its nature. If seen early, before the lesion has spread widely, I have found radium followed subsequently by intensive x -ray treatment very satisfactory. Eight to ten radium needles, of 0.6 mg. strength, are inserted from without inwards around the circumference of the meatus, deep to the lesion, and left *in situ* for ten days. This is followed up by x rays for some months. Scarring and occlusion of the meatus is a frequent sequel, and, to prevent this, its patency should be maintained from the outset of treatment by a gauze packing or the insertion of a rubber tube.

CERUMINOUS DISCHARGE

If the mass is hard its removal presents difficulties, and attempts to dislodge it by forceful syringing may damage the drum. As the matter is rarely urgent I advise the use of warm olive oil nightly for a week, and the removal of the mass then is merely a question of syringing with a little technical skill. The nozzle of the syringe should never more than half fill the opened-out meatus, when the ear is pulled upwards and backwards to bring the cartilaginous portion of the passage into straighter line with the deeper bony portion. This enables the operator to direct the stream of fluid from the junction of the posterior and upper meatal walls towards the drum, and provides for its exit along the floor of the passage. A large nozzle will not prevent this; it will fill the outer opening and the stream is directed against the mass, and damage to the drum will result, with considerable pain to the patient. To facilitate the easier entrance of the fluid posteriorly to the mass, a small gutter can be made in the latter with a probe or small forceps, under illumination, through a speculum before syringing. A little refinement to the technique makes all the difference to the comfort of the patient, and, small as this minor operation may seem, it is not uncommon to find those who can recall with much regret some previous unpleasant experience.

If there is a history of middle-ear suppuration many years before, the existence of a perforation may now be assumed, and in such a case I prefer to try and remove the mass instrumentally rather than by syringing, as a fairly common sequence of the latter is reinfection of the middle ear followed by fresh suppuration, a development which will not bring credit to the attendant. Bicarbonate of soda, 2 drachms to the pint of water, at blood heat, is an excellent solution to syringe with. I frequently use soapy water, and think its physical properties aid in the expulsion of the mass.

The fourth International Congress of Radiology will be held at Zürich under the presidency of Professor Hans R. Schinz, from July 24th to 31st, when the following subjects among others will be discussed: radiodiagnosis of bone tumours, radiological appearance of the development of pulmonary tuberculosis, radiotherapy of cancers of the mouth and pharynx, short wave-lengths in treatment, and hard gamma rays and cosmic rays. Particulars may be had from the general secretary, Dr. H. E. Walther, 14, Gloristrasse, Zürich. In connexion with the congress a special exhibition will be held comprising books, journals, etc., connected with radiology and associated sciences. The official opening of the congress will be on July 25th, by the President of the Swiss Confederation, at which meeting Professor Forssell will report on the organization of cancer campaigns.

X-RAY TREATMENT OF EXOPHTHALMIC GOITRE

BY

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The comparative scarcity of papers in our own medical journals on the x -ray treatment of exophthalmic goitre might be interpreted as indicating that there is little interest in this subject. In other countries numerous papers continue to appear. In January, 1933, Romanis stated in a paper in the *Journal* that "the results of x -ray treatment are not very impressive," and if one can judge by the correspondence which followed there is still interest shown in this line of treatment, and contrary views are held as to its merits. Douglas Webster,¹ Murray,² Cooper,³ Connell,⁴ Rowden,⁵ Riddell,⁶ all wrote upholding x -ray therapy, while Joll⁷ gave the case against it. Douglas Webster wrote as follows: "In 1926⁸ I reported marked improvement in 82 per cent. of 107 cases; further experience, with nearly 200 cases in all, has confirmed this conclusion." Rowden⁵ stated that since 1905 he had treated several hundred cases with results at least as good as those claimed by surgery. Murray² gave strong support to x -ray therapy when he said that he had found surgical treatment to be advisable in about one-twelfth of the cases. In 1929⁹ I gave details of the cases I had observed, but, rightly or wrongly, I considered as failures all cases which had to have surgical treatment after having had any x -ray treatment. Barclay and Fellowes¹⁰ obtained good results in 90 per cent. of 300 private cases, while F. Hernaman-Johnson¹¹ obtained good improvement in 50 per cent. of all cases of Graves's disease.

As a physician one does not approach the treatment of patients with any bias towards either surgery or x -ray therapy, but with the aim of obtaining satisfactory results in a high percentage of cases. In assessing the results I have placed most reliance on the variations in the weight and the basal metabolic rate, on the pulse rate, the patients' symptoms and signs, and on their own opinions as to the value of the treatment. An increase in weight and a fall in the basal metabolic and pulse rates usually go hand in hand, but one finds cases where the improvement in general health and in the pulse and metabolic rates has been accompanied by very little increase in weight; on the other hand, an increase in weight does not always mean a big drop in the metabolic rate or pulse rate. By taking all these points into consideration, and by observing alterations in the tremor, the goitre, and the exophthalmos, when present, it is possible to give a very accurate opinion on the value of the treatment. It is quite possible for a patient to improve without iodine, or x -ray treatment, or operation, but as most of my cases had some definite form of treatment, I am unable to give a competent opinion on the frequency of such a spontaneous improvement. My experience with sodium fluoride is too small to permit comparison.

SCOPE OF PRESENT INVESTIGATION

The cases discussed are nearly all those which have had x -ray therapy at Salford Royal Hospital, and have been under observation for a minimum period of one year. In many cases the period of treatment and observation has been longer, but several are also included which were sent from x -ray therapy for an operation.

I am indebted to our radiologists, Dr. Higgins and Dr. Morris, for the following note on the x -ray technique.

Two areas were treated, using a tube current of 3 milliamperes, $6\frac{1}{2}$ inch spark-gap (point to plate), through 3 mm. aluminium for five minutes, this being equal to a half Sabouraud pastille dose with the outfit used. This dosage was given at first twice a week, then once a week, and thereafter with increasing intervals between treatments as the patient improved.

The basal metabolic rate, the weight, and the pulse were taken in hospital as each patient was admitted from time to time into the ward for these examinations. Accurate estimation of the metabolic rate is difficult, and so I abandoned my attempt to carry it out on the patients without admitting them to the ward, as the results were too variable. Rest and a nourishing diet were insisted upon, but I did not prescribe iodine to any, and, so far as I know, very few of these patients had iodine from their private practitioner. It is probable that iodine has a limited sphere in Graves's disease, and I have found very little advantage from its continued administration. It is for this reason that, apart from times of emergency, iodine is only given to patients in order to prepare them for a thyroidectomy, as its value as a pre-operative treatment is most striking in those patients who have not received it previously.

In order to arrive at some estimate of the results of α -ray treatment I have divided the cases into "cure," "improvement," and "failure." I intend to consider 103 cases, and I find that during the first three months which elapsed from the onset of treatment ten patients had their treatment stopped and were sent to a surgeon for an operation to be performed. I do not propose to consider these ten cases further, as the treatment was stopped by the physician and not by the radiologist, and I do not think it is fair to include under "failure" cases which have had so little treatment.

Of the remaining ninety-three cases, at the end of six months' treatment seven had been operated on, and at the end of a year six more had been sent for operation. At the end of two years seven further patients had had operations, while at the end of three years one more case had found its way to the surgeon. In assessing the results I have included all these cases, but instead of classing them as α -ray failures, as I did in my previous paper,⁹ I have classified them according to whether there had or had not been any improvement at the time they ceased to attend the α -ray department. Some of these, therefore, are included under "improvement," and some under "failure"; none can be called "cured," as such cases would not have been sent to a surgeon. My reason for this classification of these operative cases is again because the radiologist did not in most cases recommend that α -ray treatment be stopped, and it is not beyond the bounds of possibility that further treatment might have resulted in improvement. The radiologist in some cases did advise that α -ray therapy should be stopped and another form of treatment tried. Such co-operation is of great help to the physician in charge of the case.

RESULTS OBTAINED

My records show that at the end of six months eleven cases could be considered cured, but as six months is too soon to consider all the cases these are merely mentioned as indicating that in some instances one can even hope for cure within that time. At the end of a year the results were as follows: cure, 29; improvement, 34; failure, 30.

I propose now to pass on to the final results, and it must be borne in mind that while some patients have been under treatment or observation from one to five years, some are included, as mentioned previously, who were operated on after having had α -ray treatment for a shorter period. The final results are: cure, 38;

improvement, 30; failure, 25. Of the seven cases which were operated on at six months four are included under "failure" and three under "improvement." Of the six operated on at the end of a year five are classed as "failure" and one as "improvement." If these thirteen cases are removed from the list the final results are changed, and become: cure, 38; improvement, 26; failure, 16.

In terms of percentages we then have the "cure" and "improvement" constituting 80 per cent. of the total. It is obvious, therefore, that the results could be made to appear excellent by simply excluding, on the grounds that they had not completed their treatment, all cases which were referred for surgical measures. On the other hand, by including all cases sent for an operation, the results seem quite mediocre, and in compiling the final results I have tried to steer a middle course. It would be of interest if writers were always in a position to state the number of patients who, within a reasonable time of their α -ray treatment, sought surgical treatment. It is possible that many whom a writer regarded as improved might not continue to feel the same enthusiasm about their improvement, and have tried other methods of treatment. Such a follow-up might show that a number had had operations, and the total would depend largely on the opinion which the physician in charge of the case had formed of thyroidectomy, and on the local mortality rate for that operation. My own figures, obtained on cases which were all sufficiently severe to require hospital treatment, suggest that unless approximately three out of ten such patients have an operation performed there will be many who, in spite of α -ray therapy, will suffer from chronic ill-health.

It will be observed that the final assessment shows a higher number of combined cured and improved cases than the figures given for one year's treatment, and it seems likely that the extension of the treatment beyond one year when necessary is justified, as some cases do not reach their maximum improvement at the end of one year. In following up cases year after year one finds, unfortunately, that recurrences or relapses may occur: my own records show that among the cases under consideration there were eleven patients who had recurrences or relapses, but that most of them improved with further α -ray treatment. One patient developed myxoedema and has to take thyroid regularly. The symptoms and signs came on just after treatment had been stopped, and when she consulted me six months later she was a well-marked case. Four patients died during treatment—one of pneumonia, one of mitral stenosis and heart failure, and two of Graves's disease.

I have discussed surgical measures in previous publications,^{9, 12} but I must refer to this again, as the thyroidectomy mortality rate is one requiring consideration when deciding on the line of treatment to be adopted. The mortality rate of all experienced surgeons is very low, and at Salford Royal Hospital it has been extremely low during the periods that the α -ray cases discussed in this paper were being observed.

Out of 155 cases operated on for toxic goitre there were only two deaths, both, I am told, from pulmonary embolism. These cases were operated on chiefly by Mr. Garnett Wright and by Mr. Jefferson, and they illustrate the low mortality rate which may be obtained by skilled surgeons. No fewer than forty-six of these cases had had α -ray treatment previously, and, whereas I have no details of the treatment given in fifteen of these, in thirty-one it was given at this hospital. In ten of these the treatment was given for less than three months, and was therefore incomplete. I mention this because surgeons sometimes make the unqualified statement that many of their cases have received α -ray therapy without improvement, and do not give details

of the treatment. The low mortality rate and the high percentage of cure attending surgical operations on the thyroid has made surgical treatment popular. Yet, although good surgical technique is the chief reason for the low mortality rate among our cases, it may also be due partly to the previous improvement in some severe cases under x -ray therapy, and partly to the fact that most of the patients on whom thyroidectomy was performed gave an excellent response to iodine when administered pre-operatively. Many of our cases were operated on from the medical side of the hospital and returned to it from the theatre. It is possible that some who were sent for operation might eventually have improved considerably had x -ray therapy been continued, but many of them might in the end have presented a serious surgical risk to life. Our x -ray cases were drawn from the working classes, and therefore it is the aim to try and produce satisfactory results in one year; this wish, coupled with our low surgical mortality rate, no doubt accounts for the fact that a greater number were operated on than Dr. Murray found necessary in his cases.

None the less, I believe that by sending cases which are not showing progress at an early date for operation a hospital as a whole is able to show a better percentage of improvement in all cases attending, and a lower surgical mortality rate. X -ray therapy should be given a trial in the large majority of cases, the results considered at three-monthly intervals, and those cases which do not show adequate improvement should be sent for surgical treatment. In the case of patients who, for financial or other reasons, cannot face more than a short absence from active life, an operation seems to be the treatment of choice.

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TREATMENT OF ACUTE GONORRHOEA BY MEANS OF A NEW GONOCOCCAL VACCINE OF LOW TOXICITY

BY

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The treatment of gonorrhoea is generally acknowledged to be unsatisfactory, and the multiplicity of therapeutic methods which have been used may be regarded as an indication of their inefficiency. Unfortunately, we still lack a specific antidote. The local application of antiseptics has only a limited effect because certain areas of infection are frequently inaccessible. Drugs, whether given by mouth or by injection, are of uncertain value. Specific antisera, which raised such high hopes, have failed to fulfil their promise.

The various types of vaccine which have been used and recommended for years do not appear to have maintained a high standard of effectiveness. Despite many attempts to use vaccines in the acute stages of the disease, the effects have often been disconcerting, and accompanied by a high proportion of complications. Hence their use is generally restricted to chronic cases; but here again, owing to lack of antigenic power, results have often been indifferent.

Nevertheless, it was felt that if a vaccine of low toxicity could be prepared which, when administered to patients with acute gonorrhoea, would evoke a rapid and substantial antibody response, it should at least prove useful in the treatment of the disease. Such a vaccine has been prepared by one of us (I. N. O. P.), and this paper has been written to show:

1. The low toxicity of this vaccine.
2. The rapid and substantial response of the antibody-forming mechanism of the body (as measured by the complement-fixation test for gonorrhoea) following the administration of this vaccine.
3. The effect of the presence in the blood of specific gonococcal antibodies as a result of this vaccine administration in: (a) curtailing the duration of the infection; (b) the prevention of complications; (c) curing the disease.

SUMMARY OF PREVIOUS WORK

It is stated by Thomson¹ that the first investigations of vaccine therapy in the treatment of gonorrhoea were made in 1907, when Wollstein, following the researches of Flexner on the meningococcus, showed that injections into animals of dead gonococci produced specific agglutinins and complement-deviating substances. In the same year Cole and Meakins² reported encouraging results in cases of gonococcal arthritis from the subcutaneous injections of large doses of gonococcal vaccine. Since these initial observations the subject has accumulated an enormous literature. Numerous observers have assessed results on widely different standards of cure, and a great variety of conclusions have been reached concerning the best method of preparation of the vaccine, the dosage, the type of case most suitable, and the stage of the infection at which the best results may be obtained. Autogenous vaccines and stock vaccines, recent strains and old subcultured strains, polyvalent strains and single strains—all have been recommended with varying results. These earlier workers relied mainly upon emulsions of killed gonococci injected subcutaneously or intramuscularly. Most of the vaccines so prepared were found to have the great disadvantage of marked toxicity. The general and local reactions which followed a dosage that was considered adequate were found to be distressing, and in weakly patients sometimes dangerous.

In 1913 Cruveilhier,³ following the researches of Besredka (1911), prepared a gonococcal vaccine which was "sensitized" by the addition of serum from goats that had been immunized previously by the intravenous injection of dead gonococci. He reported good results in complicated cases and the absence of any severe general reaction following the use of this vaccine; but a slight rise of temperature with some transitory pain and redness of skin round the injection site sometimes occurred. He also recorded some good results with sensitized vaccines made from living gonococci. In the same year Broughton-Alcock,⁴ working with a vaccine similarly prepared, confirmed Cruveilhier's observations as to the therapeutic benefit derived from its administration in cases where complications had occurred. In a further series of cases (twenty-six) of acute gonococcal urethritis without complications he was not convinced of any curative effect.

Subsequently, numerous workers have concentrated upon the attempt to produce a non-toxic vaccine, and brief mention of the more important of these may be made. In 1913 Nicolle and Blaizot⁵ produced "Dmagon," a vaccine which was claimed to have been rendered non-toxic by culturing gonococci on a special medium and by their subsequent treatment with a solution of sodium fluoride. They then added to the vaccine a proportion of "syncocci"—Gram-negative cocci, which these authors believed to be frequently associated with the gonococcus. In 1913 Hirschfelder⁶ used an extract of gonococci. This was obtained by dissolving them in pan-