no treatment except atropine drops. The blood had been examined several times and found normal. The count on May 4, 1937 was: red cells, 4,940,000 per c.mm.; haemoglobin, 110 per cent.; white cells, 7,100 per c.mm.; colour index 1.1. The differential white count was: lymphocytes 14 per cent., polymorphs 77 per cent., eosinophils 1 per cent., basophils 1 per cent., metamyelocytes 2 per cent., and monocytes 5 per cent.

We do not know why some patients with agranulocytosis respond to nucleotide, others to liver, and others again to neither of these substances. In acute cases, most of which are due to sensitivity to amidopyrine, the predominant cell in the marrow is the myeloblast or stem cell. It is in cases of this kind that nucleotide has had most success. Our patient's illness was chronic, and the development of his white cells was apparently arrested at the myelocyte level. He responded to liver but not to nucleotide. It may be, then, that the results of treatment are to some extent determined by the level at which leucopoiesis is arrested, but our data on these matters are still too fragmentary to be regarded as reliable evidence.

Summary

A man who had suffered for five years from an unexplained iridocyclitis was discovered during the course of a routine investigation to have a mild chronic agranulocytosis. Sternal puncture revealed arrest of maturation of the myelocytes in the bone marrow. The patient had taken amidopyrine and gold in the past, but no clear evidence of sensitivity to either of these drugs was obtained. There was no response to pyrimidine nucleotides or to pentnucleotide, but on treatment with intramuscular liver extract the white cells returned to normal levels and the bone marrow was restored to normal. The blood has remained normal without further treatment, but the iridocyclitis has not greatly improved.

REFERENCE

Witts, L. J. (1936). *Proc. roy. Soc. Med.*, **29**, 671.

L. J. Lindström (*Finska LäkSällsk. Handl.*, March, 1937, p. 207) calculates that from 2 to 3 per cent. of all males suffer from undescended testicle, and that at least thirty different operations have been devised for its cure. At the Vasa Hospital he has practised the operation devised by the American Torek on seven patients whose ages ranged from 1½ to 33 years. One of the patients, aged 22, was so pleased with the results of the first stage of the operation that he refused the second stage as superfluous. In every case the wounds healed by first intention, the testicle remained within the scrotum, and the patient was very pleased with the final results. At the first stage of the operation the testicle is detached from the surrounding structures, the cord being freed from fibres of muscle and connective tissue and the pampiniform plexus. After the testicle and scrotum have been secured to the inner side of the thigh the second stage of the operation is undertaken from four to six months later, and the testicle and scrotum are secured in the normal position. For children it may be well to give hormone treatment as a preliminary to the operation, which should preferably be undertaken at the age of 12 to 14 if a hernia or other complication has not required an earlier intervention. Waiting till puberty may render any operation superfluous; and in this connexion the author refers to the experience of Bjerke, who in 1935 gave an account of 188 Danish boys with undescended testicle. In 63 per cent. spontaneous descent occurred, the arrival of the testicle within the scrotum taking place in most cases between the ages of 10 and 15.

CANCER OF OESOPHAGUS TREATED BY DEEP X-RAY THERAPY (SYMPTOM-FREE NEARLY TWO YEARS)

BY

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This brief communication refers to a patient in whom cancer had developed in the mid-thoracic region of the oesophagus. The case-history seems worthy of publication because the method employed by Dr. Levitt (*vide infra*) for distal irradiation of the lesion was followed by a much longer freedom from recurrence than had hitherto come within my personal experience. This had been limited to local therapy, which during the past ten years or so involved the implantation of platinum-screened needles containing radium element or its emanations in glass "seeds."

It is scarcely necessary to add that, by direct oesophagoscopy, these were inserted into the visible growing margins of the lesion and its deeper peripheral extensions in so far as these could be gauged by careful inspection of the diagnostic x-ray film. Perhaps it may be permitted me to state that having been associated with the Radium Institute since its foundation in 1910, an exceptional amount of material has been at my disposal for testing various techniques which, each and all, have aimed at providing uniform and efficient irradiation of oesophageal cancer. Yet in spite of such advantages the results have been very disappointing. I cannot recall to mind a single patient who did not succumb to the disease within twelve months from the commencement of treatment.

In making this statement it would be only fair to add that a large majority of those patients belonged to the poorer classes and did not seek relief from their chief symptom, dysphagia, until the primary lesion was far advanced and not infrequently associated with near or distant secondary deposits. In such circumstances it was only possible to destroy the obstructive portion of growth and thereby restore the power of swallowing. As might be expected, considerably longer respites were afforded to patients more happily situated provided that their lesion was treated in its earlier phases. But even so, I think it will generally be agreed by experts that luck has played a considerable part when a patient has enjoyed a comparatively long freedom from recurrence, because this implies that, by mental visualization alone, the surgeon has been fortunate enough to implant the radium needles in the deeper, peripheral, and actively growing areas of the growth (*vide* H. S. Souttar, *British Medical Journal*, May 1, 1937). On the other hand, it cannot be denied that those who have mastered the technique of local irradiation will secure better results than the occasional operator—which seems to support the definition of "luck" as "an accident which rarely happens except to the competent."

Be that as it may, I had seen a few patients who, after treatment by deep x-ray therapy, had secured far longer periods of freedom from recurrence than any obtained by me with local irradiation, and the following case-history seems to warrant the advice which was given to the patient.

Clinical Record

H. S., aged 75, was referred to me on July 7, 1934, with the history of "difficulty in swallowing," which had been slowly increasing since it was first noticed some three

months earlier. Otherwise he was a well-built, healthy-looking man who appeared to be much younger than his years. A medium-sized oesophageal bougie met with complete obstruction about four or five inches below the cricoid constriction. The patient was referred forthwith to Dr. Walter Levitt with the expressed wish that he should treat the case by deep x-ray therapy provided that my provisional diagnosis of a malignant lesion was confirmed by x-ray examination of the strictured region. He sent the patient to Dr. John Sparks, who returned a "true bill" within a few hours, and thenceforward Dr. Levitt took charge of the case. It may be of interest to those engaged in radiotherapeutics to read the following description of and comments on the method he adopted, together with other details which should be of value to surgeons who are practically concerned with cancer of the oesophagus.

Notes by Dr. Walter M. Levitt

The Method.—(1) The rays are entered through long narrow fields centred over the oesophagus—long because of the tendency of the disease to spread submucously up and down the oesophagus, and narrow in order to limit the irradiation of normal tissues. (2) Usually six fields are employed, and these are grouped about the mid-line, three anteriorly and three posteriorly. A geometric method of planning them is used in order to ensure accuracy of firing. (3) The treatment is applied daily for about a month. (4) The technical details of the treatment are so adjusted that a certain minimum *intensity* ("brightness of illumination") is obtained at the growth, and a certain daily *dosage*. (5) Severe skin reactions which arise as a result of giving the requisite dosage invariably clear up rapidly and without any difficulty.

Results.—A good palliative result is obtained in a high proportion of cases—over 60 per cent. The growth apparently disappears and swallowing is restored. The ultimate prognosis, however, varies in the different sections of the oesophagus. The best situation is the upper third of the oesophagus. One patient with a carcinoma in this region is alive and well three and a half years after treatment and another three years after treatment. It seems likely that a certain number of permanent cures may be obtained in this region. The middle third growths do very well for a time, perhaps a year or two, but so far no patient has survived longer than two and a half years. The lower third growths give the worst results, as to both immediate result and duration. Growths originating in the cardia of the stomach and invading the oesophagus should not be treated.

Complications.—The two most common are mediastinitis and lung changes. Mediastinitis results when an extensive infiltrating growth is rapidly absorbed, leaving the oesophageal wall porous to the oesophageal contents, thereby allowing the mediastinum to be infected. This is not a common complication. Lung changes, although their incidence has been reduced, still occur in a proportion of cases, especially in the middle third growths, and they vary in severity. If the patient survives long enough they tend to improve; but at any stage the patient may succumb to an ordinary acute respiratory infection.

In Mr. S.'s case the treatment was applied from July 9 to August 28, 1934, and it will be remembered that the lowest portion of his stricture always showed a suspicious roughness after the treatment. I cannot help feeling that I did not carry my fields down as low as I ought to have done; if I had the result might have been better.

Subsequent History

On September 18 and November 29, 1934, Dr. Levitt reported that there was "no sign of any growth and food was being swallowed without any difficulty." This satisfactory condition was maintained for approximately eighteen months, when the patient again began to notice

a slight obstruction to the passage of "stringy foods and the skins of certain fruits." On May 6, 1936, under a general anaesthetic and by direct oesophagoscopy, I found that the upper end of the original ulceration was represented by a dull white ring of scar tissue through which it was only possible to pass a No. 14 bougie, and this met with a second constriction about two inches further down. It was soon found that if the bougie was passed through both of these and left *in situ* for five minutes semi-solid food could be swallowed without difficulty. The patient quickly learned to carry out the manipulations without assistance. Nevertheless it was impossible not to regard seriously the recurrence of some degree of dysphagia, however much one hoped it might be due to a later development of scar tissue in the lumen of the original growth. But had there been any doubt as to its recrudescence this was soon dispelled by the supervention of hoarseness, which on September 17 last I found to be caused by "recurrent paralysis" of the left vocal cord, and obviously implied a mediastinal extension of the oesophageal growth.

Thenceforward difficulty in swallowing increased rapidly, and finally liquid nourishment was in great part regurgitated. Consequently on December 14 I inserted a Symonds gum-elastic tube, which afforded an easy passage for fluid nutriment. It remained *in situ* for three weeks, by which time maceration had brought about its collapse and therefore an almost complete inability to swallow liquids. On January 5, 1937, a fresh tube was inserted, and this sufficed the needs of the patient until March 21, when he died in his sleep.

Comment

The dates given in the above case-history show that from the completion of the treatment the patient lived four months short of three years. During that time he was entirely symptom-free for a year and eight months, and for the following eight months there was little difficulty in swallowing soft foods after the passage of a No. 14 oesophageal bougie. Furthermore, until the late autumn of last year the patient was able to enjoy all the amenities of his country life, which included riding and shooting. None of my previous early cases treated by local irradiation had lived more than fifteen months, and few reached the anniversary of such intervention. Nor am I aware of any records which prove that other surgeons have secured more favourable results. Had the case above reported been so exceptional as to merit the criticism that "one swallow does not make a summer" I should have hesitated to draw any deductions from my solitary harbinger, but seeing that Dr. Levitt (*vide supra*) had been able to prove the existence of others, I feel tempted to believe that "the winter of our discontent" with local irradiation of oesophageal cancer has been made brighter by what is termed deep x-ray therapy.

A. Hagedoorn (*Brit. J. Ophthal.*, May, 1937, p. 234) describes the changes occurring in a woman of 56 years who had been under treatment for trachoma since childhood. Several photomicrographs, minutely described, illustrate the paper. After two years' treatment the eye and posterior parts of the lids were excised. On examination sections indicated a precancerous condition. One year later a small recurrent tumour appeared confirming the diagnosis of cancer, though no other metastases were discovered. Only one case of cancer associated with trachoma has been previously recorded.