of hearing for lower forks; C zero not heard at all. Rinné positive; conversational voice heard at 4 feet; occasional tinnitus. There is no indication of intracranial growth.

Dr DAN M'KENZIE (President) said he had come across a number of cases of disharmony, but never in a patient whose hearing was otherwise unaffected. A pianist once came to see him because all the notes he played with his left hand had gone flat, and he noted that he was a little dull of hearing on the left side. There was found to be a subacute catarrh of the middle ear. The hearing was found to be half a tone lower on the left side than on the right. Eventually the two ears came into balance again. The other cases he had seen, also in musical people, were late cases of otosclerosis. He had known singers who could no longer take the key, and it was very distressing to them, especially as some had to earn their living as singers. It seemed almost as if the appreciation of harmony was a function distinct from ordinary hearing.

Mr J. A. GIBB said that he had seen a singer who had a sudden attack of deafness, with facial palsy on the left side. She was quite unable to sing in tune. The condition cleared up under iodide of potassium. There was no history of syphilis.

PROCEEDINGS OF THE FORTY-EIGHTH ANNUAL CONGRESS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Montreal, June 3, 4, 5, 1926.

(*Notes from the Report of Charles J. Imperatori, M.D.*)

The Use of Radium in Polypoid Ethmoiditis.—Dr Samuel McCullagh presented a report upon the subject, based upon the post-operative treatment with radium of seventeen cases of polypoid ethmoiditis. Benefit resulted in all of them. A capsule containing 50 mg. radium was applied to the ethmoid region for two hours. The dosage was repeated four or five times at intervals of ten days to two weeks.

The conclusions at which he had arrived were that the intervals between the recurrence of nasal polypi were lengthened; the fibrous element in the polypi became more pronounced and the volume decreased; accompanying asthma was relieved. The question of definite cure was still *sub judice*, but radium was the most effective agent yet found for the control of this condition.

In the discussion which followed, Dr Swain stated that he had used successfully this line of treatment in four cases. One case he regarded of sufficient merit to record in detail. The polypi were extensive, were present also in the frontal sinuses, the intersinus septum being eroded. He opened both frontal sinuses and removed a large

https://doi.org/10.1017/S0022215100030164 Published online by Cambridge University Press

part of the left ethmoid, which was the side most prominently involved. The case appeared to be cured, but later fresh polypi developed. Radium was then applied and the polypi had ceased to form. Two years had elapsed since the operation.

Attention was drawn by more than one speaker to the necessity of carefully screening the radium. It was important to avoid its destructive effect especially upon the septum, as ulceration and necrosis might occur. It was advisable to co-operate with an expert radiologist. The possible risk of the patient swallowing the radium was also referred to.

The End-results of Treatment of Malignant Tumour of the Maxillary Antrum.—This subject was presented by Dr Gordon B. New of the Mayo Clinic.

The combination of cautery and radium for the treatment of malignant tumours of the antrum of Highmore since 1917 has eliminated the operative deaths usually associated with this disease, and has produced a higher percentage of cures than previous surgical measures. In 1920, New reported the treatment of eighteen malignant tumours of the antrum by this method, emphasising the fact that there had been a decrease in the percentage of recurrence.

During the eight-year period from 1917 to 1924 inclusive, 168 patients with malignant tumours of the antrum were examined: 129 of the patients had primary tumours of the antrum, and 39 had tumours of the antrum secondary to tumours of the upper jaw.

In the selection of patients for treatment, the usual factors must be considered, namely, the age of the patient, the extent of the growth, the previous treatment, and the duration of the disease. More extensive forms can be treated by this method than by surgical treatment alone.

The grading of epitheliomas after the classification of Broders has been the greatest advance in determining the treatment and also the prognosis. A patient with an extensive squamous-celled grade-two epithelioma of the antrum might be beyond all chance of cure with the cautery or diathermy, whereas a patient with a squamous-celled epithelioma of the same size but of grade four, with no metastasis, might have a reasonable chance of being cured by the use of radium introduced directly into the tumour. In the malignant growths of a lower grade, including the mixed tumours, one must depend almost entirely on cautery or diathermy, whereas in the high-grade epitheliomas and sarcomas the results depended largely on radium rather than on cautery.

The patients selected for treatment were those who appeared to have a reasonable chance of being cured. A great deal of care was exercised in making the selection, because treatment with only partial

https://doi.org/10.1017/S0022215100030164 Published online by Cambridge University Press

removal of a very extensive low-grade epithelioma may stimulate it to grow faster than it otherwise would.

During the eight-year period from 1917 to 1924 inclusive, cautery and radium were employed in the treatment of malignant tumours of the antrum. In the earlier cases, patients were anæsthetised with ether and the tumour was cauterised through the mouth, either above the alveolar process or through the palate, whichever proving the more accessible route. During the last few years patients have been anæsthetised whenever possible with block anæsthesia, 0.5 per cent. of procain hydrochloride being used; the pharynx was then packed with gauze, and nitrous oxide given through the nose as required. Nitrous oxide has always been employed alone when the situation of the tumour did not permit the use of local anæsthesia.

Diathermy has almost entirely replaced the use of soldering irons because it requires no protection for the surrounding tissues, and may be employed with greater facility. However, the soldering irons were used in practically all of the cases reported. It was brought out previously that treatment for such cases depended largely on the grade of the tumour. For those of low-grade malignancy, cautery was better, whereas for the high-grade, radium was more useful. The aim was to destroy the tumour entirely in one treatment. At the time of operation, radium was inserted directly into the cavity, or to the point in the antral wall at which it seemed to be most needed. Jacketed tubes, steel points, or emanation seeds have been employed as thought advisable. Radium was also used on the surface of the face and neck in cases in which it was indicated, both before and after operation.

It was essential for the patient to return for observation every month or six weeks, so that if a recurrence took place it might have immediate care. If the patient could not do this, he should take treatment nearer home when such a plan may be followed.

Malignant tumours of the antrum were of various kinds. Squamous-celled epithelioma occurred most frequently. Lympho-sarcoma, fibrosarcoma, osteosarcoma, adenocarcinoma, and sarcoma were also found. The ages of the patients with the various tumours of the antrum varied from 3 to 77 years. A study of the 168 cases of malignant tumours of the antrum seen at the clinic showed that about twice as many males as females had such lesions. The duration of the symptoms before examination varied from two weeks to over three years.

The end-results in the treatment of malignant tumours of the antrum with cautery and radium have confirmed the conclusions of a previous report in 1920. There were no operative deaths among 97 patients treated. Of the 70 patients with primary tumours, 9 lost the eye on the side involved, and of the 27 with secondary

https://doi.org/10.1017/S0022215100030164 Published online by Cambridge University Press

tumours, 2 lost an eye. Of the 70 treated patients with primary malignant tumours of the antrum, 21, or 30 per cent., were living without recurrence from fifteen months to eight years. The pathology of the 21 living patients showed 4 with squamous-celled epithelioma, grade two; 2 squamous-celled epitheliomas, grade three; 2 squamous-celled epitheliomas, grade four; 4 fibrosarcomas, 2 sarcomas, 2 lympho-sarcomas, 1 osteosarcoma, 1 mixed-cell sarcoma, and 3 adenocarcinomas. Of the 27 patients with secondary malignant tumours of the antrum there were 14, or 51.8 per cent., living from fifteen months to eight years. The pathological type of tumour in the 14 living patients was in all, squamous-celled epithelioma, grade two.

By the use of the cautery in the form of soldering iron or diathermy, and by the use of radium in the treatment of malignant tumours of the antrum, operative deaths are eliminated and more patients are cured than by previous operative methods.

Carcinoma of the Larynx and Laryngeal-Pharynx treated with Radium; An Analysis of 30 *Cases.* — This subject was brought forward by Dr Charles J. Imperatori.

In the 30 cases studied, 28 were males and 2 females. The ages ranged from 35 to 74 years. As to occupation, sufficient data could not be obtained to be of any value in the report. The data as to family history were not sufficient to be conclusive. There was one patient who recalled that his father died of cancer of the throat. The past history was of negative importance as regards symptoms referable to the larynx. One patient had had a cyst of the epiglottis removed six months previously.

The first symptoms noted by the patients were hoarseness in 18; dysphagia in 18; pain in 8; and dyspnœa in 3. There was positive evidence of enlargement of the glands in 23 patients; the glands were not palpable in 7 patients.

The teeth were good in 1 patient; artificial in 9; bad in 18; and in 2 not noted.

The pharynx was normal in 4 patients, and 26 had chronic pharyngitis.

There were 30 biopsy reports, and of these 29 were squamous-celled epithelioma and 1 basal-celled epithelioma.

The number of applications of radium in each patient ranged from one to nine, the average being two and three. Forty-nine block and thirty-one needling applications were given. The usual result following the use of radium was that more or less œdema of the whole growth occurred. This usually subsided in a week or so. This was particularly noted when needles were used. The wound of entrance of the needle occasionally showed an œdematous spot. One patient developed an acute toxæmia following the application of the radium

https://doi.org/10.1017/S0022215100030164 Published online by Cambridge University Press

and died within four days. Another, on whom a laryngectomy was performed, developed a milder degree of toxæmia. This patient was still alive. The longest period of observation was three years.

A summary of the present status of the patients is as follows:—

(*a*) Cured, 1 case. This was a basal-celled epithelioma and it is felt that the cure was effected at the time the biopsy was done, although it was very possible that the few cancer elements at the base of the growth were destroyed by the use of radium. Three 5 mg. needles were inserted into the outer border of the cord. The patient was now 77 years old, and the vocal cord showed no evidence of the site of the growth nor any loss of mobility. He had a very good voice.

(*b*) Alive, 9 cases. These patients were alive, but very weak and enduring all the tortures and sufferings that only a patient with cancer of the throat has during the last few months of life.

(*c*) Alive, and apparently improving; 1 case. This patient neither smoked nor drank. A diagnosis of a precancerous growth was made over a year previous to the report of squamous-celled epithelioma, obtained in June 1925. Radium was applied as noted, but it seemed that the growth was enlarged, so that a laryngectomy was urged, but the patient refused any operative measures. He was then referred for high voltage röntgen-ray treatment, and after twenty treatments there was a decrease in the size of the growth.

(*d*) Alive after tracheotomy, 1 case.

(*e*) Alive after thyrotomy, 1 case.

(*f*) Alive after laryngectomy, 1 case. These require hardly any comment, except to say that the last two patients are alive because of these operations. In one there was considerable sloughing following the application of radium, and in the other a moderate degree of toxæmia.

(*g*) Dead, 16 cases.

Conclusion.—The cure of cancer of the throat, in all but exceptional cases, would not seem to be attained through the use of radium.

A. Logan Turner.

https://doi.org/10.1017/S0022215100030164 Published online by Cambridge University Press