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IRRADIATION OF THE NASOPHARYNX*

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Irradiation of the nasopharynx by the otolaryngologist is not longer in the experimental stage but is a definite and accepted therapeutic adjunct in the field of otolaryngology. Crowe with his associates, in otolaryngology, and Burnam, in radiology, both working at the Johns Hopkins Hospital for the past ten years, have in their experimental work shown conclusive evidence of the value of irradiation of the nasopharynx, particularly in patients showing an impairment of hearing for high tones.

The impaired hearing for high tones was universally thought to be due to an inner ear nerve lesion, and according to Crowe this was usually found to be true. In a few cases, however, he found the organ of Corti normal histologically and changes in the middle ear only were found, secondary, in his opinion, to an overgrowth of lymphoid tissue in and around the pharyngeal orifice of the eustachian tube.

It has been known for many years that the lymphocytes are extremely sensitive to irradiation, and Crowe turned to his associate, Burnam, for advice as to the best method of approaching the mass of lymphoid tissue in the nasopharynx. The radium applicator, as later described, was devised, and used successfully for the treatment of this lymphoid tissue, which was most difficult to remove surgically without causing, as a rule, severe cicatrization. Marked improvement followed irradiation of the orifice of the eustachian tube in these selected cases of chronic eustachitis, and middle-ear deafness was subsequently greatly improved.

The advantages of the application of radium directly to the orifice of the eustachian tube is obvious; namely, the radiation does not have to pass through innocent tissue and thus cause the inevitable changes that take place in all tissue following radiation. Further, the small dosage of radiation in the procedure recommended below may be applied from one to several times, with the results under the direct observation of the otolaryngologist. Burnam has said that the specialist in ophthalmology and otolaryngology should master the principles of ray theray, and either carry out the treatments personally or have these treatments carried out in the way that is likely to produce the best results.

The procedure of irradiation as advised by Crowe is as follows: Three treatments are usually given, each 8½ to 12 minutes to each side, with the 50 milligram monel metal radium applicator in direct contact with the tissue to be irradiated. An observation period of from thirty to sixty days after the third treatment is advised before further therapy. The object of irradiation, according to Crowe, is to remove the particular lymphoid tissue which is causing the patient's symptoms; namely, to reduce the lymphoid tissue at the orifice of the eustachian tubes and not to remove all the lymphoid tissue in nasopharynx. If the symptoms are relieved after three radiations, it is unnecessary to give further irradiation, but if needed, further treatment may be given, with proper control. During the war approximately

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25,000 treatments were given with the monel radium applicator by medical officers of the Army Air Forces and at the New London submarine bases in order to prevent recurrent aerotitis. The average result was 90 per cent effective, and not a single instance of radium burn or poisoning or a drop in the white blood count has been reported. According to Crowe, the only requirements for procedure are an accurate examination with the nasopharyngoscope, location of the tissue to be treated, and placement of the applicator so that the side, not the end of the radium-containing chamber contacts the tissue observed. The time element, namely 8½ to 12 minutes, must be accurately observed, and this is best done with an automatic interval timer. The applicator as used has the radium filtered by one millimeter of monel metal; thus filtered, the beta rays, which do not penetrate as deeply as the gamma rays but are more effective on the lymphoid tissue than the gamma rays, are chiefly relied upon. The result of the irradiation is thought to be an inhibition of mitosis in the germinal centers of the lymphoid tissue; thus the new cells, lymphocytes, do not multiply, and the lymphoid mass is reduced as the old cells disappear. The use of radium in the nasopharynx is not indicated if the lymphoid mass is large. For this reason irradiation should follow an adenoidectomy rather than precede it.

Asthmatic children have, according to Crowe, frequently shown marked improvement following the second irradiation, but more usually about a month after the third irradiation. Exacerbation of the asthmatic attacks has frequently been observed by the authors up to sixty days.

Ward and Moffatt have reported a series of thirty-four asthmatic children in which all forms of asthma were represented; 68 per cent of the patients obtained from total to 50 per cent relief.

Some recurrence of adenoid tissue after surgery is so frequent that this recurrence must be regarded as almost normal. Thus the history of an adenoidectomy does not essentially mean that without the use of the nasopharyngoscope the nasopharynx may be dismissed as an etiologic factor in either deafness or asthma.

The recurrence of the lymphoid tissue itself, particularly in individuals of the lymphoid diathesis, is so usual that, as with the adenoids, some recurrence is usual. In our series of some four hundred irradiations of the nasopharynx, it was found that six months to a year is the usual time of relief relative to some recurrence of lymphoid tissue. However, the recurrence of the primary deafness or in the cases which have shown improvement relative to their asthma has not reappeared essentially at this time. Further radiation at the time of this recurrence of lymphoid tissue is, in our opinion, indicated, and for that reason it is emphasized that this technic be mastered by the otolaryngologist, so that the tissue may continuously remain under his observation.

In conclusion, in using the radium applicator it is essential to protect yourself and your office personnel, because of the repeated short exposures, which are, of course, cumulative. Care must be exercised both in the storage and in the therapeutic use of the radium.

SUMMARY

1. The use of the 50 milligram monel metal radium applicator for irradiation of the nasopharynx has been definitely established as a valuable therapeutic adjunct in the field of otolaryngology.

2. The specificity of action of irradiation upon lymphoid tissue causes this type of treatment to be indicated wherever masses of this tissue are thought to be factors in the hard of hearing or in asthmatics.

3. Irradiation of the nasopharynx can be

carried out by the otolaryngologist who has familiarized himself with the procedures or by the radiologist working with the otolaryngologist: it is advisable that the treated area remain under the observation of the physician who is acquainted with the normal appearance of the localized tissue.

4. The simplicity of procedure in itself recommends that all who treat either deafness or asthma at least be aware of the procedure.

5. Care should be exercised in the protection of the office personnel from the cumulative effect of short exposures to the radioactive substance.

BIBLIOGRAPHY

Burnam, C. F.: General factors in irradiation therapy, Ann. Otol., Rhin. & Laryng. 55:764-778 (Dec.) 1946.

Crowe, S. J.: Irradiation of the nasopharynx, Ann. Otol., Rhin. & Laryng. 55:779-788 (Dec.) 1946.

Queries and minor notes: irradiation of the adenoids, J.A.M.A. 134:112 (May 3) 1947.

Ward, A. T.; Livingston, S., and Moffatt, D.A.: Asthma in children; treatment with the radium nasopharyngeal applicator, J.A.M.A. 133:1060-1062 (April 12) 1947.