

The left eye is exophthalmic, the lower two-thirds of the cornea being keratinised, vascular and opaque, and the fundus can be seen only dimly through the remaining part. It was possible to make out that the disc was swollen. The orbit is evidently filled with a recurrence which projects forwards above the eye, where it is very hard and tender. The eye has been immobilised for some time past, presumably through involvement of the nerves at the back of the orbit, and during the last month the right eye has been similarly involved, but the optic disc is normal, and there is no evident loss of vision. The lid droops, the pupil is semi-dilated, and the eye cannot be moved in any direction. There is no evidence of any secondary growth, but the abdominal wall was found to be somewhat rigid. Her doctor tells me that she eats very little and it is evident that her weakness is progressive.

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THYROIDECTOMY AND THYROTROPIC EXOPHTHALMOS (EXOPHTHALMIC OPHTHALMOPLÉGIA)*

A Review of 1001 Thyroidectomies

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It has been noted since the early days of thyroid surgery that the exophthalmos of primary thyrotoxicosis (Graves' disease) did not always subside following an otherwise successful thyroidectomy, but that in certain cases it even progressed. Benedict and Knight (1923) of the Mayo Clinic described a case of progressive exophthalmos following thyroidectomy performed six months previously, and there are now many other reports in the literature of this sequence of events. Zimmerman (1929) recorded 11 cases in which this condition followed thyroidectomy, and in Russell Brain's (1944-45) series of 61 cases there were 11 which were post-operative. Mann (1946) in a series of 18 cases observed during the war years, reported 7 post-thyroidectomy cases. Robertson (1945) reported 9 similar cases with the loss of both eyes in two cases and the loss of one eye in two other cases. With similar cases being reported in increasing numbers, it began to appear that thyroidectomy was associated with a definite risk of thyrotropic exophthalmos. Robertson (1945) states that he does not

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think he would operate on a patient over 40 years of age who, in addition to exophthalmos, showed lid oedema.

In this apparent increase in the incidence over the last few years two factors were probably operating. The first was that the condition was now recognised as a clinical entity, distinct from the exophthalmos of primary Graves' disease, and as such, appeared in the literature. The second, and more problematical, was that the increase was due to some other factor such as the emotional stress of the war. In support of this Mann and Russell Brain both found a history of psychic trauma to be common in their cases.

The question then arose as to whether thyroidectomy resulted in the risk of progressive exophthalmos that the above figures seemed to suggest, or whether the striking clinical features of the condition and frequent sequelae of blindness had led ophthalmologists to overstress the danger. It was therefore felt that a large series of patients who had been submitted to thyroidectomy should be reviewed and an attempt made to assess the true frequency of the condition, both in its grosser form and in the milder asymptomatic form.

It was decided to review all the cases of toxic goitre admitted to the Royal Free Hospital under the care of the late Cecil Joll between the years 1940 and 1944 inclusive. These numbered 1,001 and of these 986 cases had been submitted to thyroidectomy. A questionnaire detailing the symptoms and signs of thyrotropic exophthalmos was prepared and sent to the family doctor of those patients who had been operated on. In instances where the patient was known to have moved from the original district or no reply was received from the doctor a questionnaire, necessarily less detailed, was sent to the patient.

Replies were received from 58 per cent. of those to whom the questionnaire was sent. Any statistical analysis is therefore impossible, but at the same time it is thought that the figures are of interest, and perhaps significant.

An analysis of the 1,001 cases reviewed is given herewith in Table I:

TABLE I

| | | |
|---|--------|-----------------|
| (i) Number of female patients who replied | ... | 487 |
| (ii) Number of male patients who replied | ... | 46 |
| (iii) Number of patients who died after operation | | 36 |
| (iv) Number of patients who could not be traced | ... | 105 |
| (v) Number of patients who did not reply | ... | 312 |
| (vi) Miscellaneous | | 15 |
| | | Total ... 1,001 |

Referring to Table I above, it is to be noted that 36 patients have died since operation. In 27 of these cases the cause of death was ascertained, and in no case was there any suggestion of thyrotropic exophthalmos before or at the time of death. Pneumonia was a frequent cause of death of those patients who died soon after operation, while later deaths were often due to carcinoma. Excluding the groups (iii), (iv), (v), and (vi), it is found that only 533 cases are left for consideration for the final analysis.

Each case history was then taken and considered in the light of the pre-operative findings and the reply to the questionnaire for evidence suggestive of thyrotropic exophthalmos. As a result of this 49 patients were asked to report to Moorfields Eye Hospital for further detailed investigation. Twenty patients did not report and ultimately 29 patients were examined. Of these, 9 showed no evidence of any disease whatever, and of the remaining 20, 5 patients showed evidence of hyperthyroidism and 8 were slightly or mildly myxoedematous and were controlled by thyroid extract. One patient suffered from post-operative tetany and one was being treated with stilboestrol for pruritis vulvae. Others showed a variety of minor complaints. Only three patients showed slight evidence of thyrotropic exophthalmos and their case histories are summarised below:—

Case 1. Mrs. S. G., aged 24 years, had a partial thyroidectomy for Graves' disease in 1941. When seen at Moorfields in 1947 she was myxoedematous and complained that her eyes were becoming more prominent. Her eyes were proptosed and the lids oedematous. She appeared to be a definite example of post thyroidectomy thyrotropic exophthalmos.

Case 2. Mrs. C. C., aged 58 years, had a partial thyroidectomy for Graves' disease in June, 1941. Subsequently she became myxoedematous and was given thyroid extract, which she later discontinued. When seen at Moorfields in November, 1947, she had the typical features of myxoedema together with chemosis and proptosis. In this case the myxoedema was complicated by excess pituitary thyrotropic hormone.

Case 3. Mrs. A. B., aged 39 years, became mildly myxoedematous following a partial thyroidectomy in 1944. On examination at Moorfields in addition to slight exophthalmos she showed some puffiness of the upper lids. She appeared to be a mild case of myxoedema with some excess thyrotropic hormone.

The diagnosis of thyrotropic exophthalmos is suggested by the presence of exophthalmos, swelling of the lid due to increasing fat and later stasis oedema, oedema of the conjunctiva and orbital contents and weakness of the extra-ocular muscles. The greatest difficulty in diagnosing mild cases is that there is no readily available means of assessing the thyrotropic hormone content of the blood, and biopsy of the orbital contents is usually not feasible. Therefore the diagnosis and the differential diagnosis of thyrotropic exophthalmos must be purely clinical. However, these cases showed definite evidence of mild thyrotropic exophthalmos, and slight myxoedema. The exophthalmos was slight and none

showed any evidence of diplopia or other disturbance of ocular function. In no case was there any evidence of venous congestion of the retinal vessels or oedema of the disc, nor any gross oedema of the eyelids, nor gross chemosis.

The ages of the patients were evenly spread from late youth to early old age whereas thyrotropic exophthalmos is largely a disease of late middle life. Further, they were all females and the condition is known to be 36 times more common in males than females (Mann, 1948). All three had had seven-eighths of the thyroid removed.

DISCUSSION

The most surprising feature made evident by this investigation is the infrequency of thyrotropic exophthalmos as a sequel to thyroidectomy. The figures of Mann (1946), and others quoted above had suggested that the incidence would be certainly appreciable. It was therefore expected that the review of such a relatively large number of cases in which thyroidectomy had been performed would have revealed a few gross cases and several minor cases of thyrotropic exophthalmos. Gross cases of the condition, owing to their striking clinical features, would obviously have required hospitalisation and would be unlikely to have escaped notice. Nothing suggestive of this type of case was found in the replies received either from the patients themselves, their family doctor or in the notes on the cause of death of patients who had died since operation. Since in all, only three mild cases were discovered the incidence after thyroidectomy appears to be only a fraction of one per cent. Part of this incidence must be attributed to the care in the selection of cases for operation and the technical skill of a surgeon of great experience, the late Cecil Joll. These findings are confirmed in a personal communication from Sir Thomas Dunhill. In his experience of thyroidectomy extending over forty years he has only encountered two cases of thyrotropic exophthalmos. Each of these had been operated on by another surgeon. Among his own operation cases there were several in which some of the signs were those encountered in exophthalmic ophthalmoplegia and in which tarsorrhaphy was performed because of the extreme exophthalmos with chemosis and ulceration, but in all of these the eyes became normal, except in one patient. In this patient one eye was lost—the other eye became normal. Photographs of each of these patients have been published. (Dunhill, 1930.)

With careful surgery it seems that the risk of post-operative thyrotropic exophthalmos is more apparent than real.

SUMMARY

1. Recent literature suggests that thyrotropic exophthalmos commonly follows thyroidectomy.
2. To investigate the true incidence of this as a complication, a questionnaire was submitted in regard to 1,001 patients admitted to the Royal Free Hospital for thyroidectomy from 1940-1944.
3. Satisfactory information was obtained in 584 cases.
4. Three cases, only, of thyrotropic exophthalmos of a mild degree were found.
5. No gross cases of the condition occurred.
6. The condition is rare as sequel to thyroidectomy.

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THE GLASS ROD TEST IN GLAUCOMATOUS EYES*

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IN his first paper on the aqueous veins Ascher described the so-called "glass rod phenomenon"¹. This phenomenon is produced by compressing the recipient vessel just beyond the meeting-point of an aqueous vein and a blood vein. There are two possible results. The aqueous may push away and replace the blood in the recipient vein so that it enters the vein previously filled with

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