RECESSION OF THE LEVATOR MUSCLE FOR LAGOPHTHALMOS IN EXOPHTHALMIC GOITER

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Several methods have been used in the past to correct the defective closure of the lids incident to the exophthalmos in exophthalmic goiter. Such methods are applicable as a measure of protection to the cornea not only preceding thyroidectomy but after operation as well when the exophthalmos persists.

In general, three methods of approach have been used. The first attacks the lids directly; the second attempts to modify the sympathetic nervous supply of the orbital contents, and the third aims to decompress the orbit. The external tarsorrhaphy advocated by E. Fuchs and the modifications of this operation employed by others correct the deformity to a satisfactory degree. Axenfeld used a looped silk suture. The upper end of a white silk suture was passed along through the upper lid parallel to the margin, and in the same manner the lower end was passed through the lower lid. At the outer canthus the ends crossed and were buried after being tied with sufficient tension to obtain the necessary correction. Jaboulay, in 1896, was the first to perform cervical sympathectomy. Fairly good results were obtained with this procedure. Charles Mayo removed both superior and middle cervical ganglions, as suggested by Jaboulay. In addition, he ligated the superior thyroid vessels through the same incision. As a result of this procedure, the exophthalmos was reduced, and there was a slight drooping of the upper eyelid. Tinker, in 1912, performed a modified Krönlein-Kocher osteoplastic resection of the outer wall of the orbit. He removed fat and resected a portion of the outer wall of the orbit. His

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end-results were satisfactory. Naffziger and Jones appear to have made a real contribution when they decompressed the roof of the orbit and optic foramen, in this manner releasing the orbital contents and pressure on the optic nerve. They do not advise the operation merely for persistent or stationary exophthalmos. The indications they propose are limitations of ocular movements, loss of vision and changes in the optic nerve. Their results have been good, and there have been no recurrences.

In the following report recession of the levator muscle was performed in each of five patients with exophthalmic goiter. In four of these the exophthalmos persisted following thyroidectomy. The operation was performed with a view to repairing the defective closure of the lids.

REPORT OF CASES

CASE 1.—S. K., a girl, aged 20, was admitted to Mount Sinai Hospital with a history of nervousness, loss of weight and exophthalmos. One year before a two-stage thyroidectomy was performed. The basal metabolism was plus 48. The exophthalmos in the right eye measured 22 mm.; in the left, it measured 20 mm. Vision in both eyes was 15/15. The patient complained of inability to close her right eye. The right levator muscle was receded 5 mm. through the con-junctival side.

CASE 2.—I. M., a woman, aged 41, with exophthalmic goiter had had a subtotal thyroidectomy in 1924. However, exophthalmos had persisted for the following eight years. She was readmitted to the hospital with an ulcer of the right cornea. It was a central, punched-out ulcer with undermined edges. The exophthalmometer reading (Hertel) was 25.5 mm. in the right eye and 26 mm. in the left. There was, in addition, external strabismus in the left eye. The basal metabolic rate was plus 23. The ulcer was treated for a few days, but without marked improvement. The right levator muscle was receded nasally and mesially 5 mm., and temporally 7 mm. The procedure was carried out from the conjunctival side. The eye was closed for one week. The sutures were then removed. The result was so satisfactory that the patient requested that the left eye be operated on as well. This was done one week later.

CASE 3.—P. B., a man, aged 55, was admitted to the hospital with the complaint of nervousness and a painful right eye. The exophthalmometer reading was 28 mm. in the right eye and 24 mm. in the left. The conjunctiva of the right eye was markedly chemotic and injected. There was a 3 mm. ulcer on the lower part of the cornea. The metabolism ranged between plus 19 and plus 35. Vision in the right eye was 15/70, and in the left eye, 15/50. The right levator muscle was receded 5 mm. through an incision in the skin. The eye remained closed one week. The ulcer was found to be healed. The conjunctiva was less chemotic and injected. The lid covered the entire cornea. One week later the left levator muscle was receded 5 mm.

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CASE 4.—B. O., a woman, aged 47, had a thyroidectomy performed in 1932. Both eyes showed marked protrusion with good motility and the usual lid signs of exophthalmic goiter. Vision in the right eye was 20/20. The media were clear and the fundus normal. The left eyeball was injected, the iris atrophic, the lens cataractous and the vision nil. On April 22, 1933, recession of the levator muscle of the left eye was done and on April 29, recession of the levator muscle of the right eye.

CASE 5.—A. B., a man, aged 47, had a thyroidectomy performed in July, 1930, and a bilateral sympathectomy in February, 1933. He was admitted to the hospital with tremendous exophthalmos of the left eye and beginning endophthalmitis following corneal ulceration with marked chemosis of the conjunctiva and edema of the lids. It was necessary to enucleate this eye. The vision in the right eye was 6/200. The nerve head showed papilledema. Exophthalmos was not measurable on account of the physical condition of the eye. In this case recession was performed as a preliminary step to further treatment. Recession of the levator muscle was done, with marked improvement.

![Image](https://jamanetwork.com/)

Fig. 1.—The picture on the left shows bilateral exophthalmos; appearance before operation; the center illustration, appearance after recession of the left levator muscle, and on the right, recession of both levator muscles.

A preliminary measurement must be taken to determine the amount of recession necessary. The distance between the free margin of the upper lid and the upper limbus is measured in the vertical meridian of the cornea. Similarly, the measurement is taken of the distance between the free margin of the lower lid and the lower limbus of the cornea. The sum of these distances represents the amount to which the levator muscle should be receded.

TECHNIC

Under local anesthesia (procaine hydrochloride, 2 per cent, without epinephrine) the upper lid is everted and an Erhardt clamp applied with solid blade above. An incision, extending the entire length of the lid, is made through the conjunctiva only at the upper border of the cartilage (fig. 2A). The upper flap of conjunctiva is freed upward from the underlying levator muscle for a distance of 10 mm. (fig. 2B). An incision is now made 1 mm. below the upper edge of the cartilage, through the conjunctiva and cartilage to the fascia separating the levator from the orbicularis muscle (fig. 2C). The cut edge of cartilage to which the levator muscle is attached is grasped and dissected from the fascia upward, for a distance of 10 mm. (fig. 2D). The levator being isolated, three double-armed no. 5 silk sutures on a fairly curved needle three-fourths inch long, are passed through the levator (fig. 2E). The suture is passed from within out, behind the
Fig. 2.—Steps in the operation:  

A, an incision is made through the conjunctiva only at the upper margin of the cartilage the entire length of the lid;  

B, the upper flap of the conjunctiva is freed from the levator muscle for a distance of 10 mm.;  

C, an incision is made through the conjunctiva and cartilage 1 mm. below the upper edge of the cartilage the entire length of the lid;  

D, the levator is freed from the underlying fascia upward for a distance of 10 mm.;  

E, three double-armed sutures are passed from below upward, nasally, mesially and temporally, cutting off the millimeter of cartilage before one passes sutures;  

F, the sutures are brought out on the surface of the skin just beneath the brow nasally, mesially and temporally;  

G, the cut conjunctiva is closed by a running stitch.
strip of cartilage (which is later cut off), and brought out on the skin side immediately below the brow. Three such sutures are passed and tied over pegs (fig. 2F). The cut conjunctiva is closed by a running stitch (fig. 2G). The eye is dressed in two days, and if the cornea is intact the dressing is left off. The eye is then covered with a Gifford patch made of cellophane. The skin sutures are removed in four days, and the conjunctival sutures in one week. If the cornea has been the seat of an ulcer, the dressing should be postponed for a week.

The operation may be similarly performed from the surface of the skin. By this method, the incision is made through the skin the entire length of the lid, at the upper edge of the cartilage, the globe being protected by a Jaeger horn plate. By blunt dissection, the orbicularis muscle is separated the entire length of the lids, exposing the levator muscle. A lacrimal probe is passed beneath the levator muscle, care being taken not to puncture the conjunctiva. The levator muscle is cut from its attachment and freed upward for a distance of 10 mm. Three double-armed no. 5 silk twisted sutures are passed nasally, mesially and temporally, and are tied on the skin side just beneath the brow. The skin is closed by interrupted sutures. The eye is dressed in two days, and the sutures removed in five days.

COMMENT

In all, eight operations were performed on five patients. The operation for unilateral exophthalmos is more difficult to do, because one has to match the fellow eye. In such a case it may be necessary to make minor adjustments. If ulceration is present, the procedure is modified by leaving the eye closed for one week. Overcorrection did not occur in any case, and all the patients were able to close their eyes during sleep. The exophthalmos was not influenced, but a more normal facial expression was produced. Operation is not indicated if there is serious loss of vision.