

## A PLEA FOR LATERAL ORBITOTOMY WITH CERTAIN MODIFICATIONS\*

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THE frontiers of human interest and work are often disputed and there is no exception in the anatomical dividing lines of the surgical specialties. It is particularly important that the surgeons who meet at the frontier of the orbital walls should know thoroughly how to respect and handle the structures in the neighbouring surgical fields and be prepared to deal effectively with any unexpected operative adversity and complication in their neighbour's region.

It seems reasonable to claim that the contents of the orbit should be the province of the eye surgeon. With modern diagnostic aids, particularly good stereo-radiographs, it is possible to be fairly certain that a neoplasm is within the orbit and to note the osseous changes suggestive of intracranial extension which occurs in 16 per cent. of orbital neoplasms. Arteriography and venography, using a 60 per cent. contrast medium (Urografin-Schering), may help the diagnosis in a few cases, particularly a varix of the superior ophthalmic vein. The contrast medium reaches the ophthalmic artery in 98 per cent. of cases and extends to the frontal and supra-orbital arteries in 87 per cent. and in 74 per cent. the choroidal plexus is seen as a crescent. Displacement of the choroidal plexus remarked upon by the radiologists is, I think, of no more diagnostic value than the displacement of the eyeball, and variation in the course of the ophthalmic artery, normally tortuous, is not of great help. Venography by injection of the angular vein through the skin is technically difficult, for the head must be inclined downwards and the frontal and facial veins compressed during the injection.

Probably the value in these studies is the demonstration of pathological vascularization around some space-occupying lesions and not in the displacement of the ophthalmic artery and choroidal plexus.

Injection of sterile air into an orbit may also yield indefinite results. It is, of course, clearly evident that a neoplasm which involves both the orbit and the inside of the cranial cavity, or arises inside the nose, should be attacked by the neuro-surgeon and the ear, nose, and throat surgeon respectively, or by a combined team. When the neoplasm is within the orbit, is retro-ocular, or arises from the lacrimal gland, or is a dermoid with ramifications into the

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roof and through the lateral wall of the orbit, lateral orbitotomy affords, in my opinion, adequate exposure for removal. Indeed, this approach is justified by the fact that most retro-ocular neoplasms are situated above, to the lateral side, and below the optic nerve, only about 4 per cent. being on the medial side of the optic nerve. Moreover, most of the important blood vessels and nerves lie on the lateral side of the optic nerve.

The points against the transfrontal approach are these:

- (1) The mortality even in good hands is quoted by Reese (1952) to be 4.1 per cent., and other authors report a higher incidence than this.
- (2) Failure to find the neoplasm. Several authors quote examples in which the transfrontal operation did not expose the neoplasm which on subsequent lateral orbitotomy was readily accessible for removal.
- (3) Excision of part of the frontal lobe has sometimes been necessary to obtain better access to the orbit.
- (4) There is sometimes a stormy post-operative period.
- (5) Subsequent ptosis and superior rectus weakness.
- (6) If the frontal and ethmoidal sinuses are inadvertently opened, meningitis and rhinorrhoea are rare complications.
- (7) It is well known that there is a high mortality in attempting the excision by the transfrontal route of a glioma of the optic nerve which has spread along the optic canal to the chiasma in a child.

It is a curious fact that the remnants of certain neoplasms, such as glioma of the optic nerve, meningioma of the optic nerve sheath, and haemangioma left in the 1 cm. of the apex of the orbit because of the danger of complete dissection in this small area crowded with important anatomical structures, may remain without growing for 15 years.

The following is a brief description of the salient surgical features of a lateral orbitotomy which gives wider access to the orbit than Krönlein's operation, exposes a lacrimal gland neoplasm in such a manner that the minimum manoeuvres are required for its excision, and allows part of the orbital roof to be nibbled away. It differs in small features from Dickson Wright's operation, which combines some of the advantages of the transfrontal approach:

- (1) The incision is lower and in the eyebrow line.
- (2) The lateral orbital wall is preserved and not nibbled away.
- (3) The orbital periosteum is reflected in two flaps and sewn up carefully at the end of the operation.

Fig. 1 shows the incision. The supra-orbital part is hidden in the upper line of the eyebrow and the part above the zygoma is rendered less conspicuous by being made in the horizontal skin fold of the crow's foot. It is well to make a gentle curve where the curved supra-orbital part of the incision joins the straight horizontal part for the scar is less obvious than when this is angled.

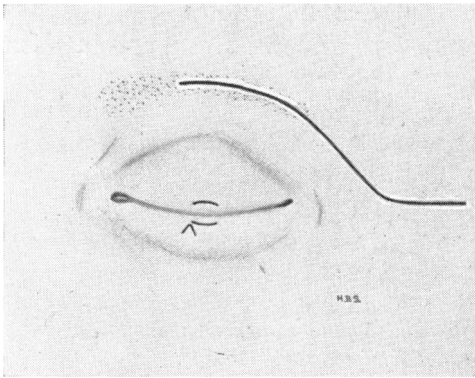


FIG. 1.—Incision.

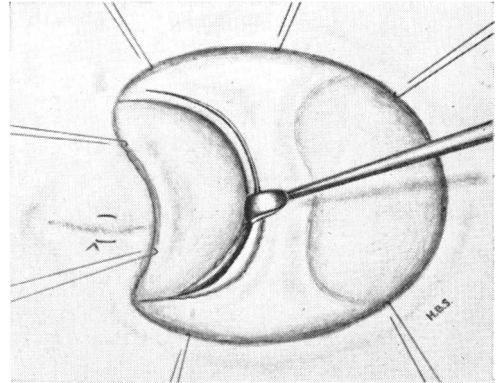


FIG. 2.—Incision of periosteum 2 mm. from supra-orbital and lateral orbital margin.

The skin and orbicularis muscle flaps are retracted by strong silk sutures clamped to the head towel. The periosteum is incised 2 mm. behind the supra-orbital and lateral orbital margins (Fig. 2), and is stripped up to the margin where it is firmly attached. Thereafter it is important for the surgeon to change his position and face the overhanging orbital margin to strip the periosteum intact from the margin. Thence it is easily separated from the lateral orbital wall back to the lateral end of the superior orbital fissure and posterior end of the inferior orbital fissure. The temporal muscle is incised for 2 cm. about 5 mm. below its origin and is reflected from the posterior aspect of the lateral orbital wall and outer surface of the greater wing of the sphenoid (Fig. 3).

*Bone Incisions.*—Fig. 3 shows: (1) a vertical incision through the supra-orbital margin and roof for about 7 mm., (2) a frontal incision through the roof of the orbit and down to the junction of the frontal bone with the great wing of the sphenoid in the temporal fossa, and (3) a horizontal incision through the malar bone conforming with the line of the lower orbital margin and upper border of the zygoma and down to the anterior end of the inferior orbital fissure.

FIG. 3.—Orbital periosteum and orbital contents retracted medially. The temporalis muscle has been cut for 2 cm., 5 mm. below and concentric with its origin, and is reflected from the posterior surface of the lateral orbital wall and the temporal fossa. An anterior view of the bone incisions is shown. Holes are drilled for retention catgut sutures when the bone is replaced at the end of the operation.

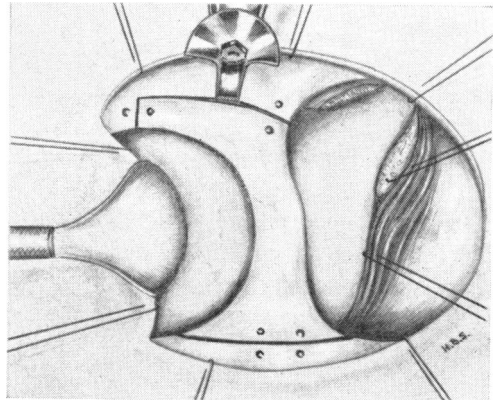


Fig. 4 shows: (4) a vertical cut made with an osteotome through the lateral wall of the orbit on a level with the temporal fossa.

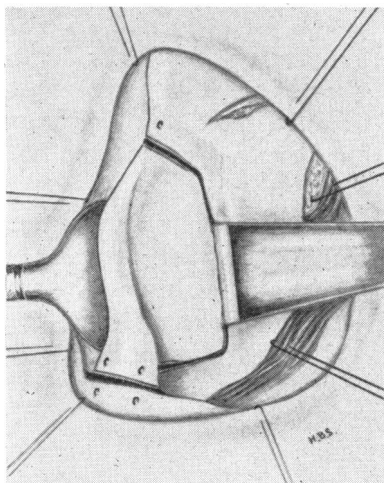


FIG. 4.—Posterior surface of lateral orbital wall seen from temporal fossa. Bone cut joining upper with lower incisions is made with an osteotome.

With a dental roseheaded burr, four pairs of holes are drilled obliquely to meet in the depths of the bone incisions for the accommodation of 20-day catgut sutures to fix the bone fragment when this is replaced at the end of the operation.

The bone is removed by non-touch technique with lion forceps and placed in warm saline in a covered container.

*Periosteal Incision.*—The periosteum is incised antero-posteriorly over the lateral rectus muscle and then crescentically 2 mm. behind its anterior edge. The two flaps thus formed are dissected, and their corners are fixed with catgut sutures and reflected, the upper towards the temporal region and the lower over the malar (Fig. 5).

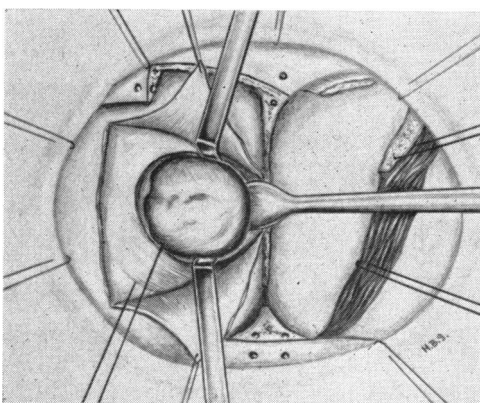


FIG. 5.—Incision in orbital periosteum. Reflexion of flaps. Retraction of lateral rectus belly. Dissection of retro-ocular neoplasm.

The belly of the lateral rectus muscle is either retracted by a suture or, to assist access to the neoplasm, the muscle is divided between mattress sutures of 20-day chromic catgut between the equator and its insertion.

*Removal of the Neoplasm.*—Separation of the orbital fat is done carefully in the antero-posterior direction, in the line of the vessels and nerves and not across it, to expose the neoplasm. Thereafter dissection is kept as close as possible to the neoplasm except when the neoplasm arises from the lacrimal gland.

Benign neoplasms, such as a haemangioma, a neurofibroma, or a neurilemmoma, are easily separated from the orbital tissue. Because of the risk of seeding, lacrimal-gland neoplasms receive the minimum of manipulation in dissection and it is well to keep wide of the neoplasm and to look for any satellite areas of growth in its vicinity. Often such neoplasms extend far back towards the apex of the orbit. Dermoid cysts may press the roof of the orbit upwards, erode the roof and the supra-orbital margin, and be attached to dura. If the dura is opened in the dissection of the cyst it is closed by a piece of temporal muscle if the opening is 5 mm. or less and by a square of fascia lata if it is larger.

Some dermoid cysts may extend in a dumb-bell shape into the temporal fossa.

An infiltrating malignant neoplasm and a chronic inflammatory mass are best left alone without attempting dissection.

A meningioma of the optic nerve sheath is incised along the length and course of the nerve from which it may be carefully peeled in the early stages of the neoplasm, for infiltration of the nerve is a late event. It may be possible to test its limitation to the nerve sheath by moving it forwards and backwards along the nerve. The removal may have to be piecemeal and indeed some of the neoplasm may have to be left in the apex of the orbit.

A little more room for the manoeuvres of the dissection may be gained by nibbling away the lateral half of the orbital roof (see Figs 6 and 7, opposite).

*Closure of the Wound.*—The lateral periosteal flaps are brought together and the incisions are closed from behind forwards with interrupted sutures of chromic catgut. The temporal muscle is replaced and sutured to its insertion. The resected bone of the supra-orbital margin, the roof of the orbit, and the lateral wall is replaced and secured in position by 20-day chromic catgut sutures passed through the four pairs of drill holes adjacent to the bone incisions. The orbicularis muscle and subcutaneous tissues are united by a layer of interrupted 20-day chromic catgut sutures. Generally no drain is required unless there has been considerable oozing. The skin incision is closed by fine silk sutures. A pressure dressing is applied.

*Malignant (Oedematous) Exophthalmos.*—When it is necessary to decompress the orbit because of papilloedema, scotomatous changes in the visual fields, and failing vision, the lateral orbitotomy incision described above may be used. On reflexion of the temporalis muscle, the posterior surface of the lateral orbital wall and the junction of the great wing of the sphenoid with the frontal bone are exposed. At the latter site, Hudson's burr is applied (Fig. 6) and the dura is exposed. From this opening the lateral wall of the orbit and the orbital roof lateral to the frontal sinus may be nibbled away (Fig. 7).

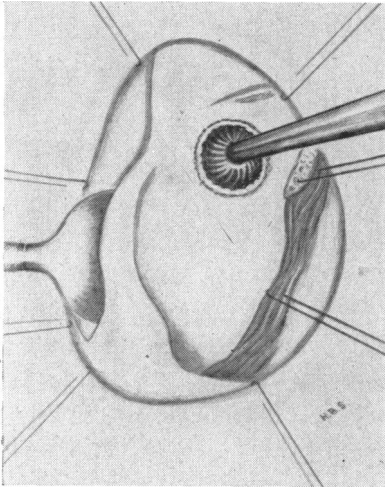


FIG. 6.—Hudson's burr applied to junction of great wing of sphenoid with frontal bone.

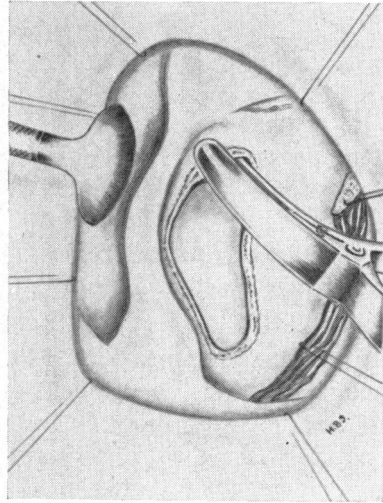


FIG. 7.—From the burr hole (see Fig. 6) the lateral wall and part of the roof of the orbit are nibbled away.

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