Coronal or Swinging Eyelid Decompression for Patients with Disfiguring Proptosis in Graves' Orbitopathy?

Comparison of Results in One Center

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Purpose: To compare 2 different approaches for 3-wall orbital decompression in patients with disfiguring proptosis due to Graves' orbitopathy, and to determine which technique is preferable.

Design: Retrospective nonrandomized study with a concurrent comparison group.

Participants: Charts of 74 consecutive patients with disfiguring proptosis due to Graves' orbitopathy who underwent coronal (46) or swinging eyelid (28) decompression between January 1, 2000 and January 1, 2004 were studied retrospectively. Patients with dysthyroid optic neuropathy were excluded.

Methods: We analyzed the following parameters: proptosis reduction, ocular motility, number of additional operations, number and kind of complications, patients' satisfaction, patients' estimation of numbness or abnormal sensations in the field of operation and surgical scars, and duration of hospitalization time.

Main Outcome Measures: Reduction of proptosis, changes in eye motility, and duration of hospitalization.

Results: Mean proptosis reductions were 4.8 mm (range, 1–11) after coronal decompression and 5.6 mm (range, 0–8) after swinging eyelid decompression ($P = 0.025$). Patients who were operated by the swinging eyelid approach had no more deteriorated motility and a shorter hospitalization time. Complications were seen rarely. Both groups of patients showed high satisfaction scores.

Conclusion: Relative to the coronal approach, swinging eyelid decompression results in at least the same proptosis reduction, no greater motility disturbance, and a shorter hospitalization time. *Ophthalmology 2005; 112:1310–1315 © 2005 by the American Academy of Ophthalmology.*

Symptoms of Graves' orbitopathy (GO) range from eyelid retraction and proptosis to diplopia and sight loss due to optic nerve compression or cornea ulcers. The course of GO is frequently characterized by an initial active inflammatory stage, followed eventually by a stable burned-out stage.[1] The active stage of GO is managed with immunosuppressive treatment, whereas the burned-out stage is treated surgically. Orbital decompression in GO is applied to prevent blindness or to correct disfiguring proptosis.

Since Dollinger performed a single (lateral) wall decompression in a patient with severe GO using Krönlein's approach to the orbit,[2] decompression techniques of 2, 3, and even 4 walls have been described. In 1969, Tessier proposed a coronal approach to the orbit.[3] Krastinova and Koornneef started to use this approach for 3-wall orbital decompression in patients with GO.[4,5] Several articles have described the efficacy and safety of coronal decompression for patients with GO.[6,7] However, many patients find the coronal approach to the orbital decompression to be more threatening than other approaches. The coronal incision is hidden by hair in some patients, but can be cosmetically unacceptable in those with thin hair or male pattern baldness. Because the coronal technique approaches both orbits at the same time, it does not make sense to decompress the orbits in 2 sessions if the patient wishes to do so. It also is less suitable for patients with unilateral proptosis. Surgeons are currently concentrating their efforts in developing approaches to orbital decompression that involve small-incision techniques. The swinging eyelid technique, already proposed by McCord in 1981,[8] seems to fulfill these criteria and became popular in the late 1990s. In Utrecht, we started to use the swinging eyelid technique in 2000, whereas in previous years we used the coronal approach and gained much experience with it. For these reasons, we were in a position to compare outcomes of coronal and swinging eyelid decompression in patients with GO, performed by the same surgeons.

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Materials and Methods

We retrospectively studied the records of 46 patients (92 orbits) who underwent coronal decompression and 28 patients (47 orbits) operated by a swinging eyelid approach at the University Medical Center Utrecht between January 1, 2000 and January 1, 2004. All coronal patients underwent a bilateral decompression, whereas in the swinging eyelid decompression group 9 patients underwent a unilateral decompression and 19 underwent a bilateral decompression during one session. We included only those patients who had disfiguring proptosis and burned-out GO and were clinically and biochemically euthyroid for at least 3 months. (Although both approaches can be used successfully in patients with optic nerve compression, we did not include these patients in order to exclude confounding factors in our study.) They were operated by 3 different surgeons (IVS, RK, MPM) from the same institution. The following items were studied: gender, age, smoking habits, previous iodine 131 treatment, previous immunosuppressive treatments and operations, exophthalmometry value, complete orthoptic examination, complications after the operation, subsequent operations, patient satisfaction, patients' estimation of numbness or abnormal sensations in the field of operation and scars, and, finally, duration of hospitalization.

Statistical analysis was done with SPSS.[9] We used the Pearson chi-square test to compare differences between categorical variables and the Student's *t* test and analysis of variance to compare scale variables. All eyes were included in the analysis.

We used coronal decompression in those patients who had already been scheduled for this operation and were on our waiting list. From the year 2000 on, patients could choose between both techniques. We recommended a swinging eyelid approach in male patients, patients with moderate to severe unilateral proptosis, and patients with high-risk factors such as diabetes mellitus or advanced age (>60 years).

Orthoptic examination included the assessment of binocular single vision, cover test (near and distance), prism cover test (near and distance), determination of monocular ductions,[10] field of binocular single vision, and Hess screen test. A subdivision into 3 diplopia classes was made: (0) normal ocular motility and no diplopia, (1) restriction of motility and diplopia at extreme directions of gaze, and (2) evident restriction of ocular motility and continuous diplopia in the primary and/or reading position.[11] Orthoptic examination was performed before and 3 months after decompression. Preoperative and postoperative orthoptic data were analyzed by the same senior orthoptist (MELdG).

Proptosis was measured with a modified Hertel exophthalmometer (Carl Zeiss, Jena, Germany) before and 3 months after decompression. To evaluate the correlation between the preoperative Hertel values and postoperative proptosis reduction, we again divided patients into 3 subgroups. Subgroup A included patients with preoperative Hertel values of ≤19 mm; subgroup B, 20 to 23 mm; and subgroup C, ≥24 mm.

The surgical technique of 3-wall decompression by coronal approach has been described.[6,7] After dissection of a subgaleal flap, the temporalis muscle is partially detached from its origin, and the thinnest part of the lateral wall is removed, allowing a fingertip to pass through and leaving the orbital rim intact. In this series, no attempt was made to remove the posterolateral wall. In patients with severe proptosis, the floor lateral to the infraorbital nerve is removed through the opening made in the lateral wall. It is removed along the nerve canal from the orbital rim to the infraorbital fissure, leaving the zygoma and lateral strut intact. Medially, after coagulation of the anterior ethmoidal artery, the papyracea lamina is removed starting at the frontoethmoidal suture and extending posteriorly as far as the posterior ethmoidal artery.

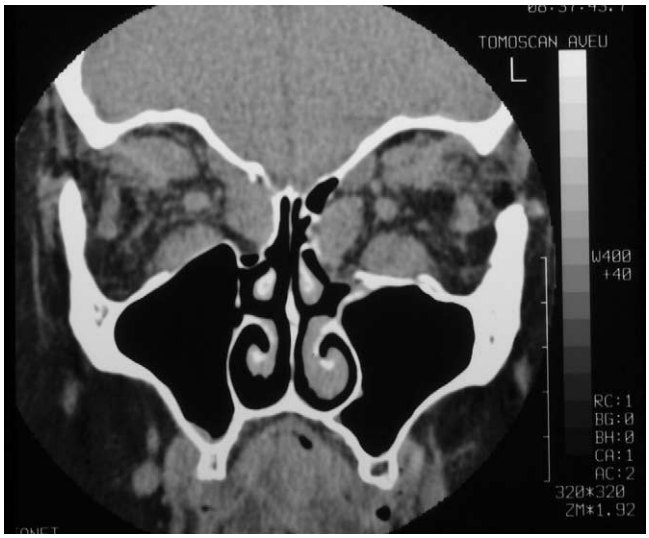

Figure 1. A coronal computed tomography scan showing decompressed orbit after the coronal approach.

The inferior part of the medial wall is removed together with the floor medial to the bony canal around the infraorbital neurovascular bundle, leaving the medial strut intact (Fig 1).

The swinging eyelid decompression technique has been described in detail by Rootman et al.[12] In our series of swinging eyelid decompression, we started to remove the floor medial to the infraorbital nerve using a hammer and chisel together with the medial wall. As much of the papyracea lamina was removed by excision or infracture that could be reached without detachment of the inferior oblique muscle and without an additional caruncular approach. As the exposure of the posterior medial wall in these conditions is suboptimal, we confined ourselves to the removal of the anterior part of the medial wall. Using the swinging eyelid approach, the floor lateral to the infraorbital nerve was always removed, together with parts of the zygomatic bone and the anterior part of the lateral wall ab interno while leaving the lateral rim intact (Fig 2). Usually, hammer, chisel, and punches were sufficient to remove bony structures, but for removal of the lateral wall, a drill was used. The periorbita was always incised to have fat herniation into the surrounding spaces. We did not combine the procedure with fat excision. Generally, we tried to tailor the extent of the decompression to the needs of the patient, whether we used the coronal or the swinging eyelid approach.

Patient satisfaction was assessed through a telephone survey. Each patient was asked to score his or her satisfaction with regard to the overall outcome of surgery on a scale from 1 to 10 (1, totally dissatisfied; 10, completely satisfied in all respects). Specific questions involved side effects of surgery and satisfaction with the operation scars and recovery of numbness in the operation fields. For the recovery of numbness and acceptability of the operation scars, we used the following grades: (0) no complaints, completely satisfied; (1) minor complaints, but "no problem"; and (2) complaints, not satisfied.

Follow-up ranged between 3 and 20 months.

Results

The preoperative and postoperative clinical characteristics of all patients are given in Tables 1 and 2. The 2 groups did not differ in terms of coexistent diseases (one with diabetes mellitus in the