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Blindness and Eyelid Surgery

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"If a man destroy the eye of another man, they shall destroy his eye." (12). This was the great law code of Hammurabi, King of Babylon, written about 2000 B.C. and promulgated for the use of the courts throughout his empire.

We may think we have trials and tribulations and persecution with the malpractice *claims* crisis (and I emphasize claims crisis, not malpractice crisis), but at least the legal profession has not reached the point of exacting an "eye for an eye." (8). It is still willing to settle for money as an equivalent or quid pro quo.

No human being has greater reverence and more profound awe at one of the most wonderful gifts to man and subhuman life than the surgeon viewing the organ of sight and applying his art around and upon the eye.

One will be amazed and overwhelmed at the great volumes of laboratory animal and clinical research on the physiology of the eye. The more one delves into the miracle of sight and the functions of the orbit and its contents, the less presumptuous one becomes in dogmatically asserting the cause and prevention of certain visual malfunctions.

This article is presented with the full knowledge that it may be used for legal as well as for medical purposes. Indeed, medical authors should be fully aware that their reports and writings are often read, analyzed, and quoted more carefully by lawyers than by doctors.

We should not advocate new-fashioned procedures as being the long sought ultimate solutions, but only record our pertinent findings and suggestions. Semantics plays an ever important role in medical writings, and even the word *suggestions* or *findings* should be substituted for *conclusions*. To conclude means this is the End, the final answer in my opinion. If the writer is eminently qualified and is in the uncomfortable university-bound position of having to "publish or perish," he may commit himself to a premise that may haunt him and the medical profession forever.

The topic of affected vision following blepharoplasty and other procedures about the eye has been presented for many years, and no attempt has been made to hide the fact that blindness has followed what is known as a cosmetic blepharoplasty. The questions that now arise are:

1. Are all surgeons aware of these complications?

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2. Is the general public aware?
3. Do surgeons inform their patients of these possible disasters?
4. Do the patients understand, want to know, or even listen to the physician who attempts to tell them of possible complications?

Within the past 10 years the number of operations on eyelids to improve both function and appearance has risen astronomically. Television, women's magazines, talk shows, and the widespread emphasis on youth has given the impression that there are safe, easy office procedures known as "eye lifts" that will take years from one's looks and have no risk whatsoever. What has been the experience of the surgeons doing the work?

A questionnaire was sent to 16,000 opthalmologists, plastic surgeons, and others doing eyelid surgery asking for their honest but anonymous reports of the type and quantity of operations done, the type and incidence of complications, the methods of treating the complications and the number of eyes that had affected or changed vision. Further questions related to retrobulbar hemorrhage and its treatment and what type of dressings, if any, were used.

A prominent data processing firm was employed, and, even though there were frantic and angry calls to the AMA, the ABA, and the presidents of all major plastic and eye societies, the questionnaire received a quicker and higher response than any other known in the history of data processing. This is evidence of the earnest desire on the part of surgeons to cooperate in collecting data and to do everything possible for the well-being of the patient.

Each surgeon participating will be given the computer results, and even at this date the forms are still coming in and will be processed. One can arrive at his own opinion as to what is being done and what to tell his patients.

In the author's opinion certain generalizations can be properly drawn.

1. Hundreds of thousands of eyelids are being operated on by highly qualified individuals.
2. Complications can occur, and naturally the worst is blindness.
3. Such blindness is extremely rare and no cause is readily apparent.

At the Annual Meeting of the American Society of Plastic and Reconstructive Surgeons in Las Vegas, two erudite and stimulating presentations were given on the subject of possible blindness following blepharoplasty. One dealt with "Acute retrobulbar hemorrhage during elective blepharoplasty" (13); the other was on "Sudden blindness following blepharoplasty" (16). Those two presentations, published as journal articles, aroused widespread discussion, dissention, and apprehension. In my opinion, the authors should be complimented on their candor and desire to help the surgical specialties; but from a legal point, it would have been far better to make suggestions rather than to didactically elaborate causes and treatment. The Editor of the *Journal of Plastic and Reconstructive Surgeons* astutely added comments from other outstanding specialists differing from the conclusions of the authors.

The articles of Hartley et al. (13) and Moser and coworkers (16) stimulated research of the literature and animal experimentation. To any who desire to know the opinions of ophthalmic physiologists, the available literature is overwhelming. Certain data are known and agreed on, but logical deduction can be attributable to the complicated functions and reactions of the eye that are still largely postulated on theory and speculation.

Many authors have written volumes that are good for initial research (1, 2, 7, 18, 20, 25). There are also several clear, concise writings dealing primarily with eyelid surgery (4, 10, 11, 15, 17, 22, 24). As to individual articles (monographs) in various journals, it would take several years to even scan them, but a few are of special interest. Even though the complication of retrobulbar hemorrhage is common to every opthamologist and every plastic surgeon who performs enough blepharoplasties, there is a paucity of cases of blindness therefrom. Only three cases could be found with true blindness following retrobulbar hemorrhage (21).

Our laboratory animal research consisted of using albino rabbits of two ages. The experiment was divided into three parts: (a) research based on blood injected into the retrobulbar area (in rabbits, a retractor bulbi muscle gives a space similar to the retrobulbar space in the human); (b) research based on pressure to the globe; and (c) research on both the combination of retrobulbar blood and pressure to the globe (Figs. 1–4).

Fig. 1. Plastic head-helmet and pressure mechanism.

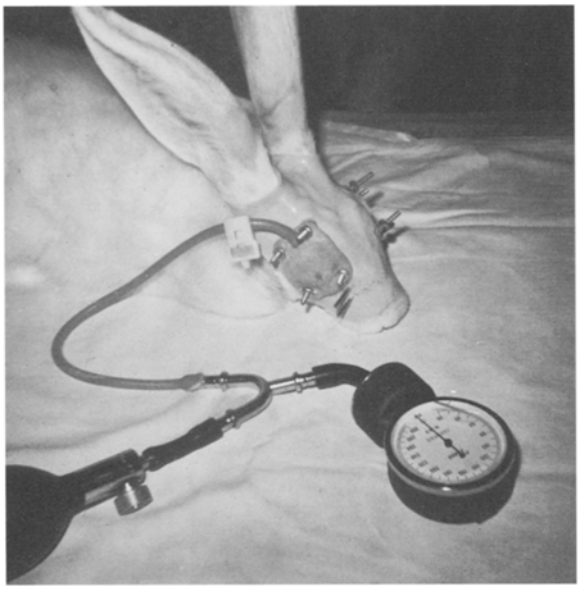

Fig. 2 Rabbit with plastic head-helmet held in place with Kirschner wires.

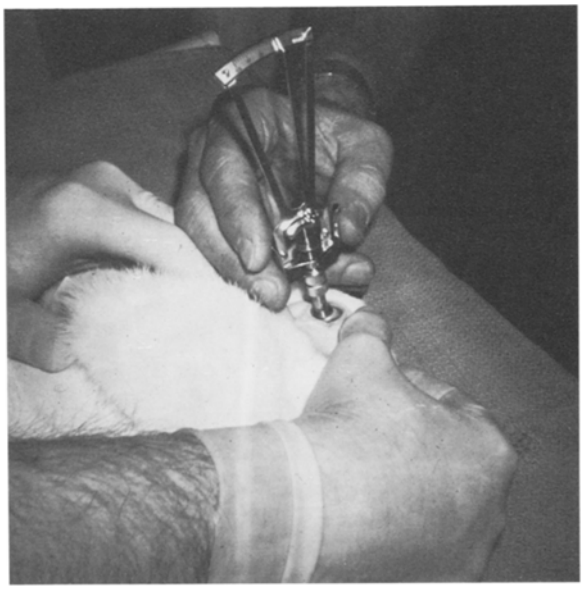

Fig. 3. Every rabbit had meticulous tonometry measurements.

Method

1. Blood was taken directly from the animal's heart, and measured amounts were injected into the retrobulbar space. The eye grounds were immediately examined, and tonometry was done at five-minute intervals. Examinations and retinal photographs were continued on the succeeding day and for the next six weeks.

2. For pressure, a device was made of acrylic in the form of a hood. This had protruding bolts and a window around each eye. The hood was fixed to the skull by driving two Kirschner wires across the maxilla and one in the soft tissue behind the ears. A bulb similar to the Anthony-Fisher antral balloon was used with a sphygmomanometer to register a measured amount of pressure on the eye. This bulb was inflated after the trap door was firmly bolted to the hood. Clamps and sutures on the tube were used to maintain pressure.

The pressure was removed in some animals at 24 hours and at 48 hours in others. Various amounts of pressure were used.

3. A combination of retrobulbar blood and pressure was used, making the procedure the same as for pressure.

As in other animal research, many efforts of trial and error were used. The rabbit was the preferred animal for several reasons:

1. The retractor bulbi space in the rabbit more closely approximates that in the human than does that of any other animal we could find.
2. The rabbit is relatively inexpensive and the care not too difficult.
3. The animal is readily available.
4. It is a healthy animal and can withstand drastic surgical procedure.
5. The rabbit doesn't bite.

We were fortunate in having William Austin, D.V.M., who has done extensive research in animal ophthalmology to assist and photograph the retinas.

A dental laboratory produced the hood from our drawings so that it fit snugly, was not painful, and allowed the animal to eat and drink freely.

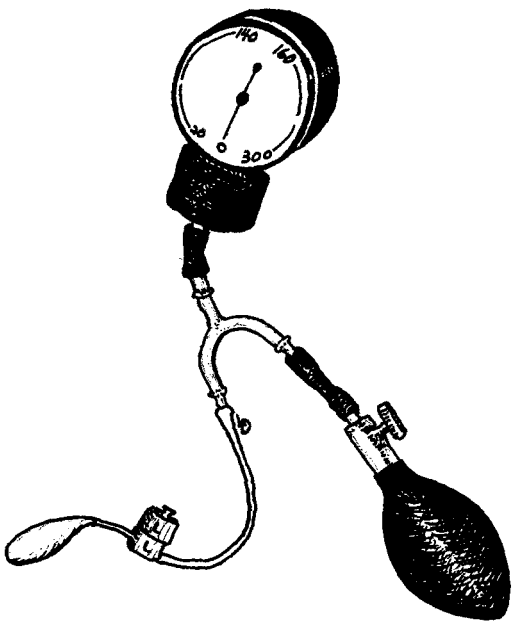

Fig. 4. Drawing showing pressure measuring mechanism applied to the eyeball of the rabbit.

Results

In brief: 1. We could not produce changes in the retina with retrobulbar blood even in such amounts that the eye was proptosed to the point of extrusion.

2. Corneal dryness would result unless antibiotic ointments were used and the lids were sutured.

3. Only a momentary change in the central retinal artery could be observed, then normal circulation.

4. A brief rise in intraocular pressure was noted, and usually within 5 minutes the intraocular pressure was below that of the preinjection period and remained below for several days.

5. Measured pressure on the globe produced changes in the retina. In our animals, we noted changes from 500 mm Hg down to 200 mm Hg. The heavier pressure by the balloon produced necrosis of the lids and cornea in addition to retinal changes. The lighter pressures produced only retinal changes.

Pressure below 150 mm Hg produced no apparent damage to the retina.

6. Intraocular pressure was almost completely absent the next day, following pressure on the globe. The circulation, however, was good. The intraocular pressure returned after 5 to 7 days.

7. Measured pressure and retrobulbar pressure—even as low as 150 mm Hg—produced retinal changes in all instances.

These findings are in accord with the research and clinical findings of other authors we could locate regarding retrobulbar hemorrhage. It is a well-recognized and undisputed fact that any acute change in vision from pressure will be exerted on the globe from without and not from within. The intraocular pressure has been researched in great detail because of the importance of glaucoma. Therefore, it is seen that nature has a mechanism of reducing the intraocular pressure quickly in response to other pressure. According to the physiologist, this is effected by the diminished amount of output of aqueous humor. It has also been demonstrated very clearly by clinical research, particularly that of Duane et al. (3,5,6,14,19,23), that increased pressure on the eyeball impairs retinal circulation resulting in field loss and finally ocular blackout. However, with continued pressure, the circulation and sight return. Duane modified the Bailliart ophthalmodynamometer with a plethysmographic goggle and applied increasing amounts of pressure until the subject noted first a constriction of visual field, then nasal hemianopic depression, and finally complete blackout. At the same time, the circulation in the retinal vessels was being observed.

Suggestions

Because of the increased interest of the legal profession and the "consumer" (I have an antipathy to the term), we must attempt to give a good *informed consent* prior to eyelid surgery. We should not despair of the term *informed consent*. This euphemism is a recent

and contrived innovation, but to date not even a single case could not be cited that was won strictly on this doctrine. We hesitate to accord it dignity by designating it a Doctrine because as of now hundreds of articles and judicial opinions have been recorded and all vary in their rendition.

It seems that the main advantage to a plaintiff attorney who invokes this doctrine is that he can get his entire case to the jury.

What is a *good* informed consent? Should we say, "Mrs. Jones, I am going to perform a little procedure on your eyelids that may make you look a little better but also there is the risk you may go blind?" Certainly not, as a positive approach is vital. For an approach to be positive, it is necessary: (a) to reassure patients of the probability of good results, yet never to guarantee them; (b) to always have another person present when examining and informing patients; (c) to maintain a good doctor-patient relationship (adequate kindness, sympathy, understanding, and time devoted to each patient can avoid a malpractice action; and (d) to present the issue of complications as a possible reality, but not to dwell on it to avoid bewildering the patient and causing him to refuse necessary surgery.

Certainly vision can be affected after eyelid surgery, but, according to our recent questionnaire, the incidence is so low that it might actually be compared to the incidence of blindness following neck surgery or inguinal hernial repair.

Try to compare vision complications with something quite familiar to the patient. Does he avoid the expressway because of the great number of tragedies? Does he give up flying because of the risk of crashes? How about aspirin? More people die every year as a complication from aspirin than of complications from eyelid surgery. Does a patient refuse to go to sleep in bed because so many people who die, in point of fact, die in bed? But blindness can follow eyelid surgery and you can be certain that he has been told so.

A short routine form is presented stating that the operation and its possible complications have been explained to the patient and that no guarantee was given. At the bottom of the form the patient then writes, "I understand what has been explained to me," and he signs with a witness present *in your office*.

A hospital consent form given by some clerk saying "Here, sign this" is no consent form and actually is dangerous. One form recently even had a space for the patient to write in his own words what was going to be done to him. A patient receiving an augmentation mammaplasty stated that an operation was to be performed on her eyelid; another having eyelid surgery said she was going to have a mole taken from her forehead.

We have enough trouble. We must not let hospital consent forms create cases for the plaintiff lawyers. They should at least have to earn their meager fees.

What about preoperative eye examinations? The questionnaire indicated that ophthalmologists perform an eye examination prior to surgery, but plastic surgeons rarely do more than a gross visual examination. Are you aware that 2% of the population at large has amblyopia or one "lazy eye" (9)? This could mean that although a patient uses only one eye and may have poor vision, if he has a little trouble in the used eye following your surgery, it would be only natural and expected for him to swear (and honestly so) that he thought he had had perfect vision before surgery.

What about latent glaucoma, optic neuritis, detached retina, and any of the other causes of blindness? They could and probably did exist prior to your surgery.

I suggest that surgeons insist that each patient be examined by a competent ophthalmologist within 3 weeks prior to surgery. Communicate with the chosen ophthalmologist; you can learn from each other. Symptomatic orbital hernia is now recognized and is no longer discouraging patients from surgery. If the ophthalmologist suggests to your patient that he forget the operation and "grow old gracefully," scratch the referring doctor off your list. Opthalmologists are our friends—cultivate, be respectful of, and honor their opinions, even though you may not fully agree with them.

Lastly, emphasize programs of continuing education. Basic research cannot always be directly extrapolated to human surgery, but it can certainly provide warning and guiding signs.

In eyelid surgery, if retrobulbar hemorrhage occurs, I suggest that you imitate the pilot who is lost. He uses the three C's: confess, climb, and communicate.

Confess means that you are genuinely concerned.

Climb into a calm attitude.

Communicate, which means consult.

I have had five patients with retrobulbar hemorrhage in the past 20 years. I confess that there was shock and panic on the part of the surgeon. One patient was a doctor's wife. In each case a decrease in blood pressure, rapid thready pulse, pallor, and weakness in the knees resulted. Naturally, I am speaking of my own symptoms. All the patients did well.

Be calm: don't stick a knife or razor blade in the anterior chamber unless you are trained in this procedure and have done it routinely. The complications may include collapse of the globe, herniation of the iris, splitting of the cornea, mass infection, and intraocular bleeding. Most authors agree that such complications can be avoided (15).

Call for an ophthalmoscope. If the central retinal artery is satisfactory, be very conservative; but I strongly suggest no pressure in the postoperative period.

Consult: in this day and circumstance you would have to be practicing in the wilds of Africa or Antarctica not to have a good ophthalmologist nearby.

Even such men as Sidney Fox, who specialized in ophthalmic plastic surgery, said, "Repair of baggy eyelids is not always an innocuous procedure (11). "Give me a nice, clean ptosis anytime" (9).

Finally, to break my own rule about conclusions: I conclude with the *obiter dictum* that: A big white rabbit who has retrobulbar hemorrhage should not have an anterior paracentesis and definitely should have no pressure applied to his eye.

As a matter of passing interest, a list of causes of blindness is appended. The importance is self-evident in that there are a great number of causes of blindness and all of these should be considered in the event that loss of sight is concomitant with surgery.

CAUSES OF BLINDNESS

Eyeball in general:

1. Simple glaucoma
2. Primary closed-angle glaucoma
3. Acute closed-angle glaucoma
4. Chronic closed-angle glaucoma
5. Glaucoma secondary to uveitis
6. Neovascular glaucoma
7. Glaucoma secondary to intraocular neoplasms
8. Traumatic glaucoma
9. Angle recession glaucoma
10. Postoperative glaucoma
11. Malignant glaucoma
12. Absolute glaucoma
13. Congenital glaucoma
14. Concussion glaucoma
15. Sulfonamide glaucoma
16. Corticosteroid glaucoma
17. Miotic glaucoma
18. Mydriatic glaucoma
19. Exfoliative glaucoma
20. Panophthalmitis and endophtalmitis
21. Malignant myopia
22. Albinism
23. Anophthalmos (excluding surgical)
24. Megalophthalmos
25. Microphthalmos
26. Aniridia
27. Coloboma, any part (excluding surgical)
28. Multiple structural anomalies
29. Disorganized eyeball—phthisis
30. General degeneration—not specified

Cornea:

31. Interstitial keratitis
32. Ulcerative keratitis
33. Phlyctenular keratitis
34. Sclerosing keratitis
35. Hypopyon with keratitis
36. General dystrophy, degeneration
37. Vascularization without ulceration
38. Vascularization with ulceration
39. Keratomalacia
40. Keratoconus

Lens:

41. Polar cataract
42. Fusiform cataract
43. Punctate cataract
44. Coronary cataract
45. Stellate cataract
46. Coralliform cataract
47. Floriform cataract
48. Zonular cataract
49. Lamellar cataract
50. Discoid cataract
51. Cystic cataract
52. Dislocated lens

Uveal Tract:

53. Iritis
54. Iridocyclitis
55. Uveitis
56. Choroiditis
57. Chorioretinitis

Retina:

58. Retinitis or retinopathy
59. Retinal hermorrhage
60. Retrolental fibroplasia
61. Detached retina
62. Retinitis pigmentosa
63. Macular degeneration

Optic nerve:

64. Atrophy
65. Neuritis (papillitis)
66. Papilledema (choked disc)
67. Neuroretinitis
68. Retrobulbar and intracranial lesions

Vitreous:
69. Hemorrhage

Infectious diseases:
70. Diphtheria
71. Gonorrhea
72. Measles
73. Meningitis
74. Ophthalmia
75. Scarlet fever
76. Smallpox
77. Prenatal syphilis
78. Syphilis acquired after birth
79. Trachoma
80. Tuberculosis
81. Typhoid fever
82. Rubella
83. Toxoplasmosis

Trauma:
84. Chemical causing burn
85. Radiation: infrared
86. Radiation: gamma
87. Firearm using explosive
88. Fireworks, any type
89. Sharp or pointed object
90. Blow or fall
91. Foreign body

Poison:
92. Methyl alcohol
93. Lead
94. Quinine
95. Excessive oxygen

Neoplasms:
96. Retinoblastoma
97. Melanosarcoma

Other diseases:
98. Anemia and other blood disease
99. Diabetes mellitus
100. Nephritis and other kidney disease
101. Vascular disease
102. Multiple sclerosis
103. Disease of pregnancy
104. Nutritional deficiency

Prenatal influence:
105. Genetic origin, established by family history
106. Genetic origin, presumed

Etiology undetermined:
107. Unknown to science
108. Evidence insufficient for diagnosis

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