Clinical Picture and Management of Subperiosteal Hematoma of the Orbit

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Subperiosteal hematomas in general are very well known to surgeons and obstetricians. They are usually the result of trauma which causes rupture of subperiosteal blood vessels and formation of hematomas between bone and separated periosteum. They are common in newborn babies. Resorption usually results in slow clearing of these hematomas, but in some areas they may cause the problems of space taking lesions or they may cause trouble by getting infected. Organization and fibrosis leading to a persisting tumor is the third way in which a subperiosteal hematoma can become a lasting problem.

Subperiosteal hematomas may also occur in the orbit. They are rare, but they typically are the result of blunt head trauma in young people and the orbital roof is most commonly involved. It is the purpose of the present paper to report the clinical appearance and treatment of another case of subperiosteal hematoma that was, at first, mistaken for an orbital floor fracture.

CASE REPORT

This 14-year-old white boy was first seen in the office of the senior author on 7-3-75. The boy had been involved in a car accident on 6-23-75 and was struck on the left side of his head. He was not unconscious and did not have retrograde amnesia. The boy was admitted as an emergency patient to a hospital in Mount Pleasant, Michigan; however, because of severe proptosis of his left eye with double vision, that had come on within about ten minutes following the accident, a left orbital floor fracture was suspected and the patient was sent to Ann Arbor for evaluation and surgery.

Our examination on 7-3-75 revealed a visual acuity of 20/15 and J O in the right eye, and 20/40 and J O in the left. A pinhole improved vision in the left eye to 20/20. Visual fields were normal. Exophthalmometer readings were 9 on the right side and 16 on the left with a basis of 91. The left eye was pushed down and out (Figs. 1 and 2). There was no external evidence of a hematoma anywhere in the head region. All eye muscles were functioning, but the left eye could not be moved up above the horizontal (Fig. 3). The boy had much vertical and some horizontal double vision. The pupils were equal and reacted promptly. Slit lamp study showed normal findings. Applanation tonometry was 10 in the right eye and 12 in the left. Fundus examination revealed moderate papilledema and horizontal choroidal folds in the left eye.

Skull x-rays revealed a hairline fracture of the base of the left skull without any displacement, but there were no signs of an orbital floor fracture. An ear, nose and throat refer showed a left hemotympanum and a left mixed hearing loss. Neurosurgical evaluation gave no additional positive symptoms or findings. A forced duction test was done on the left eye and this seemed to show that all eye muscles were free and that a mass in the upper orbit was the most likely cause of the exophthalmus, limited motility, and downward displacement of the left eye. The absence of any visible lid hematoma led
Fig. 1: The patient before aspiration of the left orbital subperiosteal hematoma looking straight ahead with ptosis and depression of the left eye.

Fig. 2: Higher power view of the eyes in primary position before aspiration of the orbital hematoma.

Fig. 3: The patient looking up before aspiration of the left subperiosteal orbital hematoma. The left eye is proptosed and cannot be moved above the horizontal.

to the clinical diagnosis of a subperiosteal hematoma on the left orbital roof.

On 7-5-75 everything was prepared for an orbital exploration under general anesthesia. As a first step, the left upper orbit was entered through the upper conjunctival fornix with a number 18 injection needle. In aiming for the suspected hematoma, the separated superior periosteum was penetrated and about four cc of old black blood could be aspirated without any difficulties (Fig. 4). The eye was immediately seen to go back into its normal position as the blood was withdrawn from the hematoma. An eye patch was applied and the anesthesia was terminated.

Fig. 4. The dark blood withdrawn from the subperiosteal hematoma on the roof of the left orbit during the needle aspiration.

Fig. 5. The eyes of the cured patient in primary position one day following the needle aspiration of the subperiosteal hematoma.

One day after surgery (Fig. 5), the left eye was in virtually normal position, the double vision and the restriction in looking up were gone, and vision had improved to 20/20 without correction in the left eye. The left papilledema and choroidal folds had disappeared within a week after the aspiration of the hematoma. The hemotympanum cleared without special treatment within a few weeks, but a nerve hearing loss on the left side remained.

DISCUSSION

The senior author of this paper has seen an earlier case of subperiosteal hematoma of the roof of the orbit in a small child following a fall on the head that closely resembled the present case in its clinical picture and excellent response to simple needle aspiration. With the exception of the case of spontaneous subperiosteal hematoma occurring on the orbital roof of a
63-year-old female, all cases known to us have occurred in children or young people. Blunt trauma to the head is the typical cause, and there may be an associated skull fracture.

The differential diagnosis between orbital floor fracture and subperiosteal hematoma should not really present a problem to the ophthalmologist if a complete examination, skull x-rays, and a forcedduction test are used. Sudden occurrence after trauma, downward displacement of the globe, and absence of a lid hematoma are the trademarks of the present entity. The help of a competent otoneurologist is of the greatest value, but in our opinion an ophthalmologist should be the primary physician in charge of the treatment of the orbital problem.

The fact that the horizontal choroidal folds in the left eye of the present patient had disappeared along with the papilledema within one week following the aspiration of the subperiosteal hematoma is of the greatest interest. Choroidal folds usually are the result of long standing compression of the globe by space taking orbital lesions and they have been observed to remain permanently in spite of the removal of such chronic orbital tumors. In the present case, the elimination of the pressure on the globe must have allowed this to return to its original shape since scarring in or on the sclera to cause a permanent depression had not had time to develop.

Orbital exploration with drainage of the subperiosteal hematoma has been the treatment in the three earlier reported cases. This was done with good success. It seems, however, that the needle aspiration done in the present case is the much safer and simpler method — and it certainly can be tried before an actual surgical exploration is started. It does not seem wise to treat a large subperiosteal hematoma of the orbit conservatively and to wait for spontaneous absorption of the blood. This could result in secondary changes like optic nerve atrophy, secondary strabismus, and permanent choroidal folds — or the hematoma might even leave a permanent orbital tumor due to organization and fibrosis. Needle aspiration certainly resulted in an almost miraculous cure in the present case.

SUMMARY

A subperiosteal hematoma was seen in a 14-year-old boy following a blow to his head during a car accident. The involved orbit exhibited exophthalmus and inability of the eye to move above the horizontal. X-rays revealed a hairline fracture of the skull and a hemotympanum was found on the injured side. A subperiosteal hematoma of the orbital roof was suspected. Needle aspiration of the blood from the orbital hematoma resulted in an almost immediate cure of all orbital and ocular problems.

REFERENCES