

A Case of Traumatic Cyclodialysis Followed by Ultrasound Biomicroscopy

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ABSTRACT

We report a case of persistent traumatic cyclodialysis treated by goniophotocoagulation and observed by ultrasound biomicroscopy (UBM) throughout the course. A 16 year-old male was struck in his right eye by a rocket firework. After the injury, hypotony continued for 4 months and he was referred to Hiroshima University Hospital. At that time, the best visual acuity in his right eye was 0.2 and the intraocular pressure was 6 mmHg. Three hundred and sixty degrees of cyclodialysis, partial peripheral anterior synechia, hypotony maculopathy and sub-retinal proliferative tissue were observed. Cyclodialysis was obvious by UBM. From 4 months after the injury goniophotocoagulation was performed six times in 2 months. Intraocular pressure recovered 6 months after the injury and reattachment of cyclodialysis and disappearance of the suprachoroidal space were confirmed by UBM. UBM was useful in observing cyclodialysis throughout the course.

Key words: *Cyclodialysis, Ultrasound Biomicroscopy (UBM), Goniophotocoagulation, Suprachoroidal space*

Blunt eye injury is known to be a cause of traumatic cyclodialysis and hypotony. Hypotony may persist and may occur as hypotony maculopathy, clinical courses of which vary from spontaneous recovery without any visual disturbance to irreversible visual disturbance such as decreased visual acuity or metamorphopsia⁷⁻⁹). As a result, it is difficult to decide when to start surgical treatment, or which surgical treatment to perform for hypotony maculopathy. Recently, ultrasound biomicroscopy (UBM) has been used to observe the sections of the anterior angle, which are not visualized by slit lamp or gonioscopy^{1,3,13}). UBM is based on high frequency polymer transducers that provide resolution ranging from 20 to 60 μm with a depth of approximately 4 mm¹¹).

We here report a case of persistent post-traumatic cyclodialysis, which was successfully treated by goniophotocoagulation from 4 months after the injury and observed by UBM throughout the course.

CASE REPORT

A 16 year-old male was struck in his right eye by a rocket firework on July 19th, 1998. He was diagnosed as having conjunctival injury and

hyphema of the right eye. The best visual acuity was hand movement and intraocular pressure (IOP) was 4 mmHg in the right eye. The right fundus was not seen due to the hyphema, but no retinal detachment was observed by B-mode echography. On the day of the injury, the conjunctival injury was sutured. The hyphema gradually decreased in a week and cyclodialysis of almost 360 degrees was revealed. Eight days after the injury, the right IOP became 0 mmHg and vitreous hemorrhage increased. The vitreous hemorrhage was transient but hypotony continued and lead to hypotony maculopathy after 2 months. He was referred to Hiroshima University Hospital Department of Ophthalmology on November 19th, 1998, 4 months after the injury. At that time, he had a right visual acuity of 0.2 and a left visual acuity of 1.5. IOPs were right 6 and left 14 mmHg. The right pupil showed moderate mydriasis. Cyclodialysis of almost 360 degrees and peripheral anterior synechia at the 4 and 10-clock positions were seen in the right eye. Cyclodialysis and suprachoroidal space were observed by UBM (Fig. 1). There were retinal folds involving the right macula, subretinal proliferative tissues at the inferotemporal retina and disc edema. Slight hem-

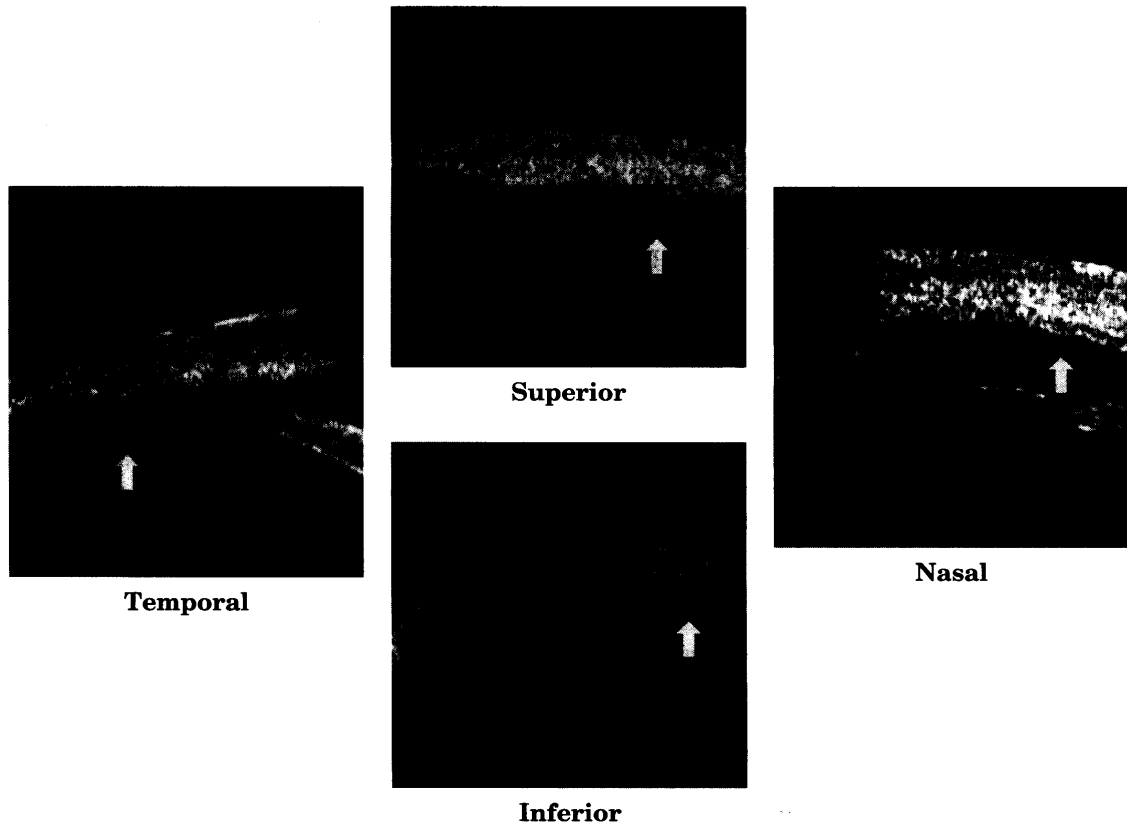


Fig. 1. UBM at the first ophthalmological examination at Hiroshima University hospital. Suprachoroidal space was observed in all directions.

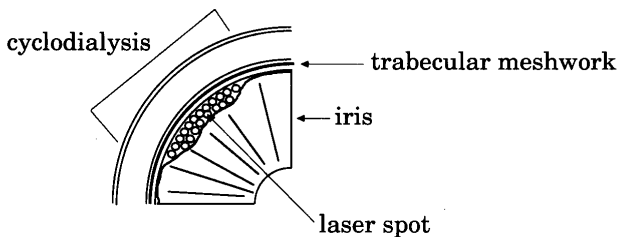


Fig. 2. Schematic drawing of goniophotocoagulation. Dye laser: 595 nm; 100 μm: 0.2 seconds; 0.3–0.4 watts was applied. 147 shots were applied in total.

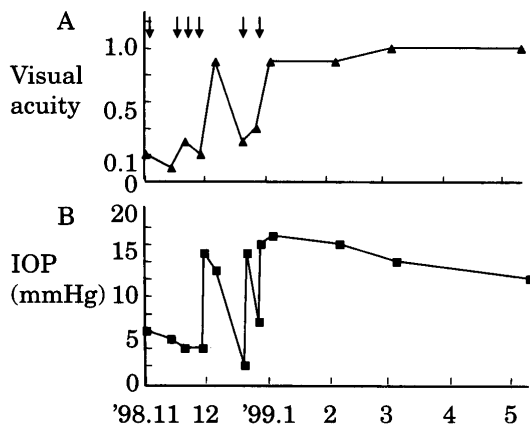


Fig. 3. A: Clinical course of visual acuity of the right eye
 B: Clinical course of IOP of the right eye
 ↓: goniophotocoagulation

orrhage and opacity were observed in the inferior vitreous of the right eye. He was diagnosed as having hypotony maculopathy secondary to post-traumatic cyclodialysis. Goniophotocoagulation was performed 6 times in 2 months from the day that he first visited until January 14th, 1999 (Fig. 2). His right visual acuity and IOP were not stable during treatment, but they normalized after the sixth goniophotocoagulation (Fig. 3). After the fifth laser treatment, the suprachoroidal space disappeared in the temporal and inferior directions but it remained in the superior and nasal directions (Fig. 4). After the sixth treatment, a narrow suprachoroidal space was seen only in the nasal direction (Fig. 5). Six months after the injury, the right visual acuity recovered to 1.0 and the right IOP was 14 mmHg. The hypotony maculopathy also recovered. The condition of the right eye has been stable for more than two years.

DISCUSSION

Most hypotony maculopathy secondary to post-traumatic cyclodialysis recovers spontaneously and the recovery periods vary from 1 month to 28 months from the injury⁹⁾. However, there have been several reported cases in which visual disturbance remains even though hypotony has recovered spontaneously without surgical treatment. On the other hand, when surgical treatment is given, not all cases have recovered from their visual disturbance with IOP normalization. A case

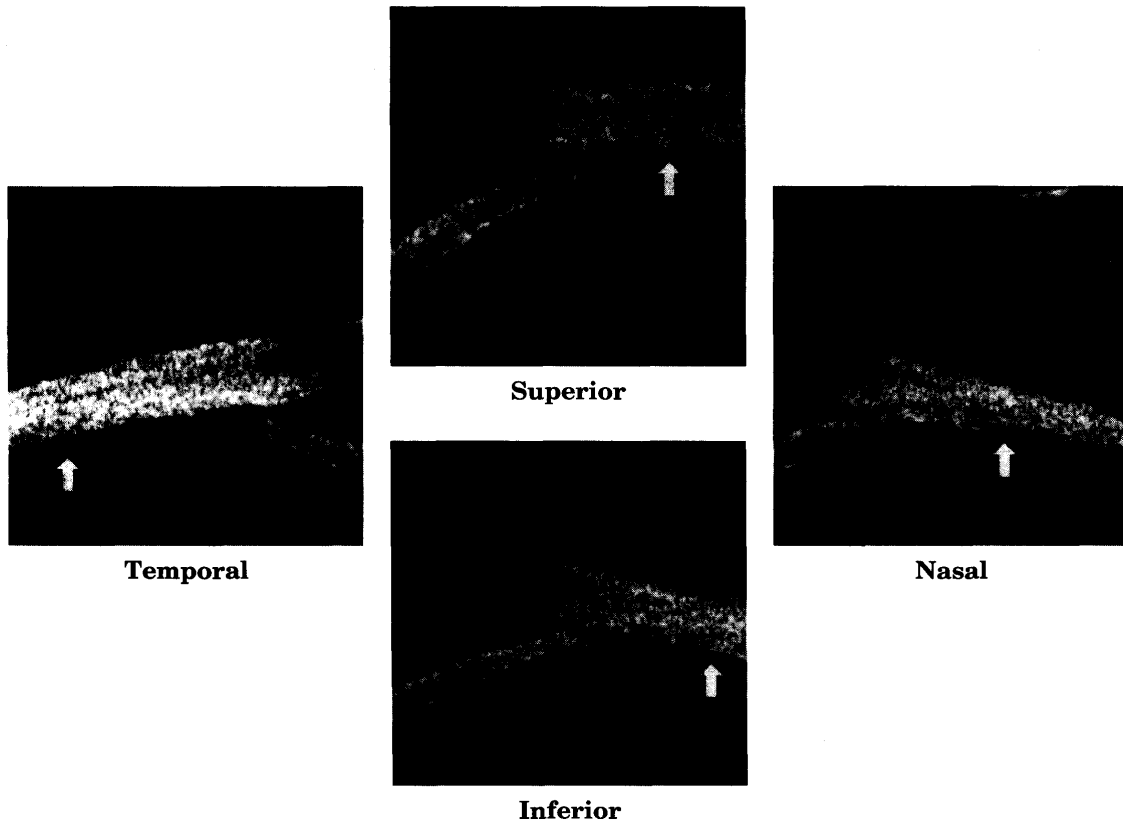


Fig. 4. UBM after the third goniophotocoagulation. Suprachoroidal space disappeared in the superior and nasal directions. It remained in the inferior and temporal directions but it became narrower than at the first ophthalmological examination.

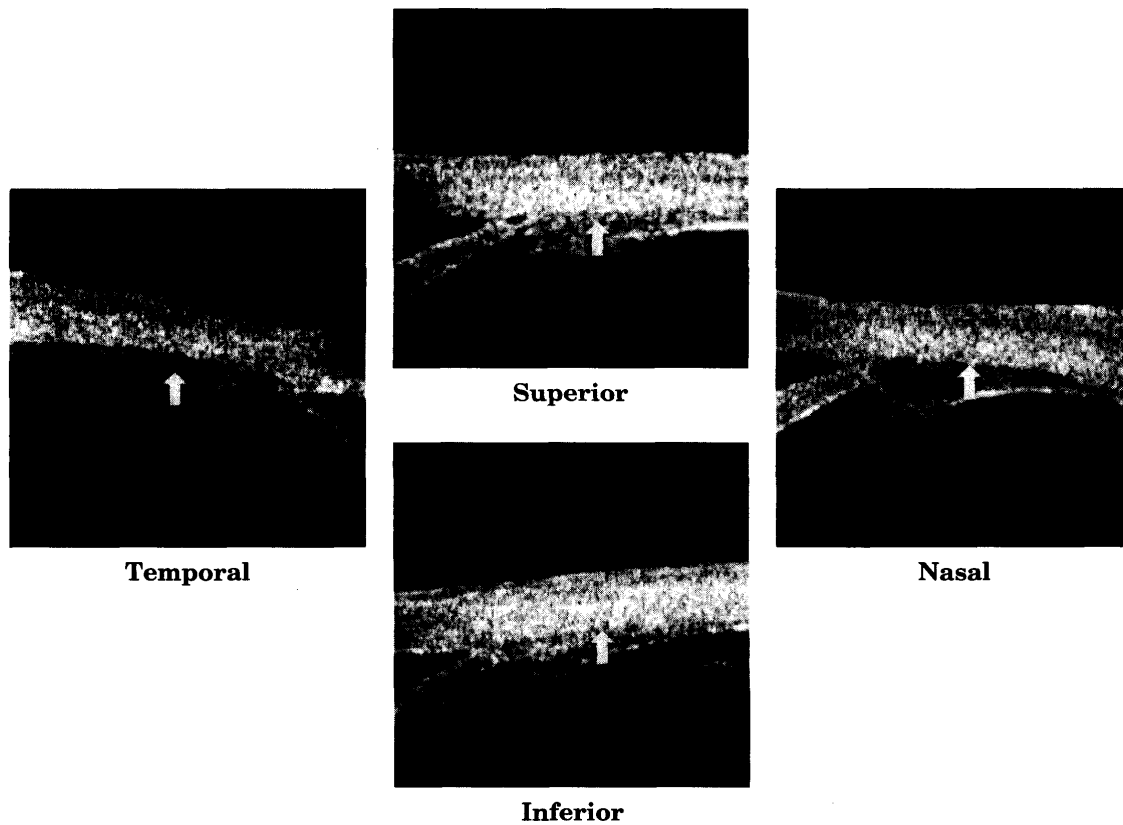


Fig. 5. UBM after the sixth goniophotocoagulation. Suprachoroidal space was seen only in the nasal direction, and had much smaller than before treatment.

with complete recovery of cyclodialysis, IOP and visual disturbance is reported in which surgical treatment was given after 40 months⁵), while there is also a case with morphopsia remaining in which surgical treatment was given only 4 months after the injury⁴). Ophthalmologists have not reached a consensus when to start surgical treatment.

There are both conservative and surgical treatments for post-traumatic cyclodialysis. It is most common to select a conservative treatment first such as atropine and steroid eye drops and to proceed to surgical treatment when the conservative treatments are not effective. Various surgical procedures have been proposed for closure of the cyclodialysis cleft. These can be divided into two groups. One is a method of generating inflammation in the ciliary body to close the cleft such as cyclocryopexy, diathermy and photocoagulation. The other is a method of adhering the cleft directly such as scleral infolding, scleral fixation of an intraocular lens and sclerociliary suture^{2,6,10,12}). Laser photocoagulation, the method we selected to treat this patient, is valuable to perform comparatively earlier because it is less invasive than other surgical treatments and it is possible to combine it with other treatments. All of these methods have the risk of IOP elevation. In this point, laser photocoagulation is superior to other methods because it can be applied while observing IOP. In this case, we could treat a patient with almost 360 degrees of cyclodialysis successfully by goniophotocoagulation. We started the surgical treatment as early as possible since there was a case in which the visual disturbance and chorioretinal atrophy remained in spite of the spontaneous recovery of hypotony in 4 months. Goniophotocoagulation was selected because the patient was young and it is a less invasive method in numerous surgical treatments. It is better to start laser treatment when we judge that medical procedures are not available. At that time, a cyclodialysis lesion was observed in detail by UBM. Almost 360 degrees of cyclodialysis and suprachoroidal space were visualized to diminish with laser photocoagulation. To avoid overphotocoagulation and IOP elevation it is useful to perform laser photocoagulation while controlling the status of cyclodialysis and suprachoroidal space. In this case, as hypotony recovered, the suprachoroidal space was diminished. This fact indicates that not only a decrease of aqueous humor production in the ciliary body but also an abnormal flow from the anterior chamber to the suprachoroidal space causes hypotony with cyclodialysis. Throughout the course, UBM was very useful for observing and evaluating the lesions of cyclodialysis and the

suprachoroidal space. By visualizing the lesions by UBM during laser treatment we were able to prevent overphotocoagulation.

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