High-Density Vitreous Substitute in the Management of Advanced Coats' Disease

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Advanced Coats' disease is a threat to vision. Management of advanced Coats' disease has long been a challenge to ophthalmologists. Some people have attempted to use pars plana vitrectomy and intraocular diathermy on diseased vessels followed by intraocular gas or silicone oil injection. However, internal drainage is technically difficult. We present a case of advanced Coats' disease for which, after an encircling buckle and pars plana vitrectomy, intravitreal injection of perfluorodecaline was used to displace the subretinal fluid to the peripheral subretinal space, and transscleral external drainage was achieved. Finally panretinal laser photocoagulation, cryotherapy and endodiathermy were performed on diseased vessels. Visual improvement and reattachment of the posterior pole were achieved. So we think a high-density vitreous substitute can be a useful adjunct in the management of advanced Coats' disease. It minimizes the disadvantages of the internal or external approaches, while maintaining most of the advantages of both. *(Chang Gung Med J 2002;25:126-30)*

Key words: **Coats' disease, perfluorodecaline.**

Coats' disease is a congenital anomaly of the retinal blood vessels which was first described by George Coats in 1908. Subretinal and intraretinal exudate, microaneurysms, and telangiectatic vessels are typical findings of Coats' disease.[1] In less-severe cases, when exudate and hemorrhage are minimal, Coats' disease can be successfully treated by photocoagulation, cryotherapy, or diathermy. In advanced cases, a bullous exudative retinal detachment with abundant cholesterol crystal deposition can be found. At this stage, methods of treatment are controversial. Some in the past advocated using external drainage, a scleral buckle, and cryotherapy.[2-6] Yoshizumi et al.[7] utilized a vitrectomy and intraocular diathermy on diseased vessels, internal subretinal fluid drainage, and a gas or silicone oil tamponade to treat advanced Coats' disease. Inoue[8] used vitrectomy, membrane peeling, and intraocular endodiathermy on diseased vessels without drainage of subretinal fluid to manage Coats' disease with bullous or tractional retinal detachment. In this article, the management of advanced Coats' disease complicated with bullous retinal detachment is described. After a vitrectomy, external drainage of subretinal fluid was achieved with the help of a high-density vitreous substitute, which displaced the subretinal fluid peripherally. In addition, photocoagulation, intraocular diathermy, cryotherapy, and encircling buckle were performed.

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CASE REPORT

A 15-year-old female patient came to our clinic complaining of progressive blurred vision in the left eye for about 2 months. She noted clearly that during a school screening examination about 3 months previous, her visual acuity had been equal in both eyes. Her visual acuity was 20/20 in the right eye, with light perception only in the left eye in December 1996. Examination of the right eye was normal. Examination of the left eye showed a quiet conjunctiva and clear cornea. The anterior chamber was clear, and the pupils were isocoric. There was a relatively afferent pupillary defect in the left eye. No neovascularization was found on the iris. The lens was clear. The fundus of the left eye was obscured by vitreous hemorrhage. Retinal detachment was noted in the lower part of the retina. There was a large, yellowish, irregularly shaped, subretinal exudative mass in the inferotemporal quadrant. Yellowish subretinal exudate was also found at the superior fundus where the retina seemed less elevated. The posterior pole was invisible (Fig. 1). Ultrasound examination of the left eye showed total retinal detachment. During ultrasound examination, the subretinal fluid revealed high internal reflectivity

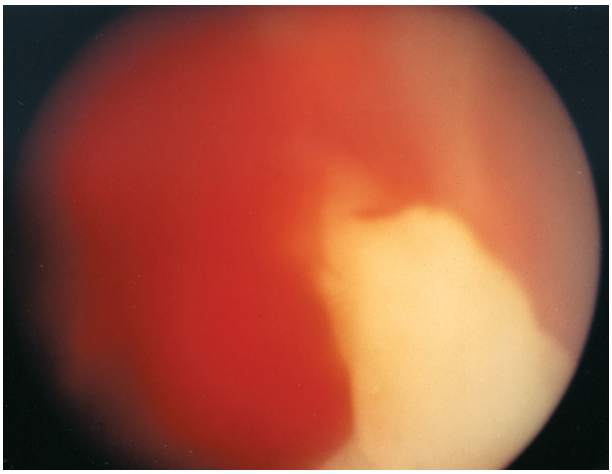

Fig. 1 Fundus photo of the left eye before the operation.

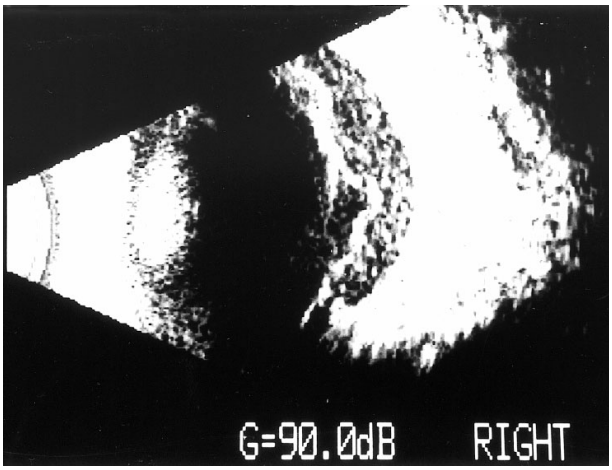

Fig. 2 Ultrasound of the left eye before the operation.

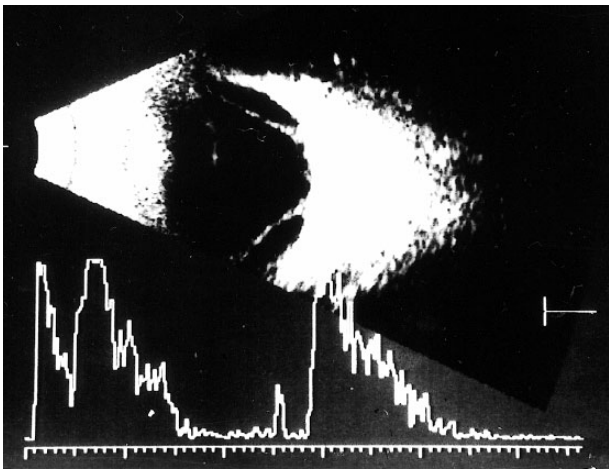

Fig. 3 Ultrasound of the left eye 3 months after the operation.

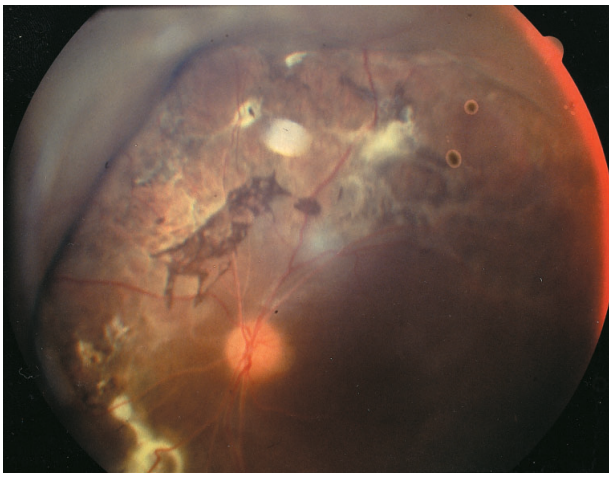

Fig. 4 Fundus photo of the left eye 3 years after the operation.

(Fig. 2). Coats' disease was our impression at this time. Pars plana vitrectomy, membrane peeling, and perfluorodecaline injection were done to flatten the posterior retina. At the same time, subretinal fluid could be displaced peripherally, and transscleral external drainage was achieved. In addition, panretinal photocoagulation, intraocular diathermy on diseased vessels, external cryotherapy, and encircling buckle were performed. Little subretinal fluid was left undrained after removal of the perfluorodecaline. Postoperatively, the patient was asked to maintain the head in an upright position while awake and a 30° head elevation while asleep for 2 weeks. The posterior pole was well attached and guarded by the laser scar after the operation (Figs. 3, 4). Residual subretinal fluid in the inferior part was gradually absorbed. However, a shallow retinal detachment with mild traction was persistent in the periphery. Her visual acuity of the left eye improved from light perception to hand motion. After 3 years of follow up, her visual acuity still remained from hand motion to counting finger.

DISCUSSION

Advanced Coats' disease is a threat to vision. Furthermore, it may lead to rubeosis irides, neovascular glaucoma, and blind painful eyes.[2,4,5] The management of advanced Coats' disease has been a challenge to ophthalmologists for a long time. Treatment with external drainage and cryotherapy has not been very successful. Retina reattachment and visual improvement are not often achieved.[5] Some people have tried to use pars plana vitrectomy and intraocular diathermy on diseased vessels followed by intraocular gas or silicone oil to salvage these eyes.[6,7] However, internal drainage is technically difficult in advanced Coats' disease. In such a situation, massive cholesterol crystals might emerge from the retinotomy site which may severely obscure the view during air-fluid exchange. On the other hand, cholesterol might be easily trapped in the retinotomy site and impede the drainage of subretinal fluid. To clear the massive, multifocal deposition of cholesterol, continuous subretinal irrigation of BSS (balance salt solution) is necessary. In cases with severely adherent preretinal membrane traction which is not easily removed completely, especially in the post-equatorial area, it is impossible for internal drainage to completely remove the subretinal fluid. This would leave an open break which cannot be sealed by air or silicone oil. With an open break, proteinaceous subretinal fluid, and the inflammation induced by surgery, preretinal traction with permanent retinal detachment is very likely to occur. To avoid an iatrogenic break, some people have tried a vitrectomy, intraocular diathermy, and external drainage of subretinal fluid.[8] This maneuver also has some disadvantages. Since the subretinal fluid is heavy, it flows to the posterior pole when the patient is lying down. Only part of the subretinal fluid can be drained. Since the subretinal fluid is high in protein and cholesterol content, a lot of the protein and cholesterol crystals remain on the macula for a long time before they can be absorbed. This severely decreases the chance for recovery of visual acuity. In this patient, we used perfluorodecaline to displace the subretinal fluid peripherally, thus facilitating a more-complete external drainage of subretinal fluid through the sclerotomy. Perfluorodecaline is water immiscible and has a high specific gravity and low viscosity. These physical features make it useful to assist in manipulating the retina during surgery, such as by removing intraocular foreign bodies, draining suprachoroidal hemorrhage, and reattaching the retina.[9] This proved to be a useful procedure because only minimal subretinal fluid was found to be left after removal of perfluorodecaline. The posterior pole has remained well attached since the day after the operation, and only a little subretinal fluid was found in the inferior part. Perfluorodecaline also facilitated application of the laser. Since the posterior pole was well attached during the operation, complete laser treatment could be applied easily, even when there was some traction on the peripheral part which could not be completely relieved. High-density vitreous substitution is a useful tool in the management of advanced Coats' disease. It minimizes the disadvantages of internal and external approaches while maintaining most of the advantages of both. It can offer an easy and effective treatment modality for advanced Coats' disease.

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以玻璃體高密度替代品治療嚴重寇氏病

吳淑雅 何昭德 何正廉 陳珊霓 蔡瑞芳

嚴重寇氏病對視力影響甚大，目前對其並無有效的治療方法。我們報告一位十五歲左眼爲嚴重寇氏病的女孩，進行玻璃體切除術及膜剝除術，並打入重油於玻璃體後部，將網膜下積水往周邊壓擠。再經鞏膜外部引流及環狀鞏膜扣壓術和冷凍治療，使視網膜重新復位。之後再進入眼內將重油拿除，並將不正常血管作電燒，以及作360度整個視網膜雷射治療。經過3年的追蹤，患眼視力進步且後極視網膜復位，不再惡化。玻璃體高密度替代品重油在治療嚴重寇氏病上，是一有用的輔助物，可提高手術成功率。(長庚醫誌 2002;25:128-32)

關鍵字：寇氏病，重油。

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