Glued Patches for Children Resistant to Amblyopia Occlusion Therapy

Occlusion of the healthy eye is the mainstay of amblyopia treatment. Occlusion therapy has practical limitations; many children actively resist treatment and some parents are marginally compliant with instructions.[1] Even when parents are knowledgeable about amblyopia and patching, 22% report poor compliance.[2] Strategies such as atropine, hand socks, inflatable water wings, benzoin tincture, occluder contact lenses, occlusive dressings, and sewing the patch to the brow and cheeks of noncompliant children have been used to improve compliance with patching.[3]

Report of Cases. We conducted a pilot study of cyanoacrylate glue applied to a patch to increase its adhesiveness so that the child could not easily remove it. We used Dermabond Glue (Ethicon Inc, Johnson & Johnson Company, Sommerville, New Jersey) and Opticlude Junior patches (3M Company, St Paul, Minnesota). Before applying the patches to humans, their safety and adhesiveness was assessed by gluing them to the surface of fresh vegetables kept at room temperature for 1 week to see if there were any adverse chemical reactions between the glues and patch and between the glued patch and the vegetable surface. We observed no adverse effects. The glued patches were then applied to the upper arm of 4 adult volunteers (including the authors) for 1 week. Only one woman developed mild erythema, which resolved without treatment.

After approval by the research ethics board at The Hospital for Sick Children, Toronto, Canada, we recruited 5 children with monocular amblyopia due to strabismus, anisometropia, aphakia, and/or corneal opacity in whom all attempts of occlusion therapy had failed. Case details and patching are summarized in **Table 1** and **Table 2**. Best corrected visual acuity was measured in both eyes and a complete eye examination was performed at the start of the study. Informed consent was obtained.

The glue was applied to the adhesive part of the patch. The patch was then applied over the good eye of the child before the glue dried. The children were allowed to go about their daily activities, including bathing and washing their faces. They wore the patch for 1 week. If any of the children wore the patch for less time, either because the patch spontaneously peeled off or was peeled off by the child, the time in hours was recorded. After 1 week, the glued patch was removed in the clinic quite easily and with little pain, as the patch was often partially detached by that time. We applied a fresh patch to the children after visual acuity testing in both eyes and external eye examination. The procedure was repeated for 4 consecutive weeks. With the use of glued patches, compliance improved gradually in all cases. Patient 3 wore the patch for 2 hours on 4 consecutive days at the end of the study. Patient 5 wore the patch for 6 days in the first week of the study and 7 days in the second week. Although our study was not designed to evaluate efficacy of amblyopia treatment using glued patches, improvement in visual acuity was noted in 2 cases. Three children developed mild erythema where the skin was in contact with the glue. In all these cases, the erythema resolved without any treatment in less than 2 days. None of the children developed excoriation or abrasion of the skin where the patch was applied.

Comment. Occlusion therapy is difficult and tedious for parents. Most studies report that at least one-third of families are unable to comply with treatment.[4] Children aged 1 to 3 years may peel off their patches. With the exception of visual compromise brought on by using only the amblyopic eye, glued patches do not restrict the activity of the child in any way, like mittens or elbow restraints can.[5] Occlusive black contact lenses put the healthy eye at some risk for infection or abrasion. There is no po-

Table 1. Demographics and Occlusion History

Case	Sex	Age, y	Cause of Amblyopia	Patching/d at Start of Study, min
1	F	2½	Strabismus	0
2	F	2	Organic[a]	0
3	F	3	Anisometropia	10-15
4	F	6	Strabismus	0
5	M	2	Sensory deprivation	60-120

[a] Unilateral aphake.

Table 2. Full-time Glued Patching and Effect on Vision

Case	Visual Acuity at Start of Study, logMAR	Time Spent Wearing Patch				Visual Acuity at End of Study, logMAR
		First Week	Second Week	Third Week	Fourth Week	
1	0.6[a]	24 h	3½ h	7 d	5 d	0.2[b]
2	1.3[a]	10-15 min	26 h	24 h	4 d	1.3[b]
3	1.3[b]	7 d	5 d	5 d	7 d	1.0[b]
4	6/120	7 d	4 d	7 d	7 d	6/60
5	Uncooperative	6 d	7 d	2 d	5 d	Uncooperative

Abbreviation: logMAR, logarithm of the minimum angle of resolution.
[a] At 50 cm.
[b] At 1 m.

tential physical risk to the healthy eye with glued patches provided that care is taken to avoid allowing the glue to contact the ocular surface or eyelids. Should any problem arise with the use of cyanoacrylate-glued patches, including intolerance by the child or family, it can be easily removed with the help of white petroleum jelly. We recommend that the eyelids be closed before affixing the glued patch.

This was a pilot study with a small sample size to investigate the potential use of a novel method of increasing patching compliance. To better understand the efficacy, risks, and suitability of glued patches, we recommend studies with larger numbers of patients and various types of amblyopia.

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Additional Contributions: J. Raymond Buncic, MD, FRCSC, referred 1 patient and David Smith, MD, FRCSC, referred 2.

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Bilateral Retinal Vasculopathy in a Patient With Dyskeratosis Congenita

Dyskeratosis congenita is a syndrome of progressive bone marrow failure associated with patchy cutaneous pigmentary abnormalities, leukoplakia, and nail dystrophy.[1] We report the case of a boy who had progressive bilateral retinal vasculopathy, evolving pancytopenia, and skin and nail changes, symptoms indicating dyskeratosis congenita.

Report of a Case. An 11-year-old white boy noticed decreased vision in his left eye during 2 months. His ocular and family history were unremarkable, but he had been undergoing medical evaluation for mild pancytopenia for 6 months. He was referred with the diagnosis of possible Coats disease.

Visual acuity was 20/20 OD and 20/200 OS. The anterior segment was normal in both eyes and the right fundus was normal. The left eye displayed retinal vascular occlusion, with telangiectasia, intraretinal edema, and hard exudates in the posterior pole. The patient had intraretinal and preretinal macular hemorrhages (**Figure 1**A). Fluorescein angiography (Figure 1B) and optical coherence tomography supported the ophthalmoscopic findings.

Treatment included 2 sessions of argon green laser photocoagulation to the region of retinal nonperfusion and telangiectasia and a single intravitreal injection of triamcinolone (4 mg/0.1 mL) for the macular edema in the left eye. On follow-up 1 year later, both eyes were found to have peripheral retinal ischemia with vascular sheathing, mild telangiectasia, and intraretinal hemorrhages (Figure 1C). Argon laser photocoagulation was directed to the areas of retinal nonperfusion in both eyes.

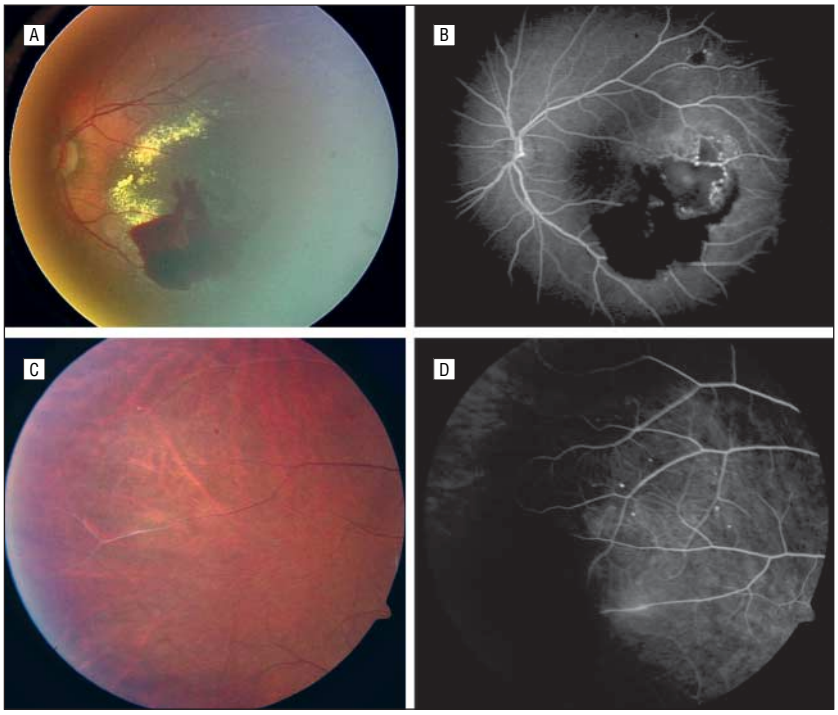

Figure 1. An 11-year-old boy had poor vision in his left eye and was found to have unilateral retinal vasculopathy. This progressed to involve the fellow eye one year later. A, The left eye showed retinal ischemia with telangiectasia, subretinal fluid, intraretinal edema, and hard exudates in the macula, with preretinal macular hemorrhage. B, Fluorescein angiography of the left eye confirmed retinal microvascular occlusion with "light bulb" telangiectasia. C, One year later, the right eye developed peripheral retinal ischemia and vascular sheathing in the temporal periphery. D, Fluorescein angiography demonstrated peripheral nonperfusion, retinal vascular staining, and minimal telangiectasia.