RESEARCH LETTER

T-Lymphocyte Predominance and Cellular Atypia in Tattoo-Associated Uveitis

Tattoo-associated uveitis is a rare but increasingly recognized form of uveitis. We describe a patient with severe tattoo-associated uveitis who underwent vitreous biopsy, revealing a T-lymphocyte infiltrate and cellular atypia.

Report of a Case | An African American man in his mid-20s was referred for severe, chronic, bilateral, granulomatous panuveitis. His history was remarkable for extensive tattooing 5 to 6 years prior with subsequent induration at the tattoo margins and decreased vision within 6 months. He was seen by a dermatologist 4 years following tattooing. Skin biopsy at that time revealed noncaseating granulomas containing exogenous pigment (Figure 1A) and results were negative for acid-fast bacilli, fungi, and bacteria. He was diagnosed as having cutaneous sarcoidosis and was referred to a pulmonologist and rheumatologist. Investigations to support a diagnosis of sarcoidosis and evaluate for other causes of uveitis included angiotensin-converting enzyme, lysozyme, vitamin D levels, purified protein derivative, tuberculosis (by QuantiFERON-TB Gold testing), chest radiography, syphilis serologies, C-reactive protein, and erythrocyte sedimentation, all of which were normal. Combination immunosuppression led to resolution of skin changes, but the uveitis remained active.

The patient required cataract surgery and Ahmed glaucoma valve implantation in the left eye. At the time of referral to a uveitis specialist (A.K.R.) 6 years following onset of uveitis, best-corrected visual acuity was 20/30 OD and 20/50 OS with an afferent pupillary defect in the left eye. Slitlamp examination revealed keratic precipitates, 3+ cell, 2+ flare, and granulomatous iris nodules in each eye (Figure 2A), and there was mild to moderate vitreous haze and optic nerve cupping in each eye without macular edema. Within 1 year, his intraocular pressure was 67 mm Hg OD and he underwent Ahmed glaucoma valve implantation and iridectomy in the right eye.

Figure 1. Cytological Findings

A | Skin biopsy specimen with noncaseating granulomas  
B | Cellular atypia in vitreous

A. Skin biopsy showing noncaseating granulomas surrounding exogenous pigment (eosin, original magnification ×10). B. Vitreous cellularity with pleomorphism and mitotic figures. Well-defined granulomas are notably absent, and lymphocytes admixed with larger cells with binucleate and multinucleate forms were present (eosin, original magnification ×10).

Figure 2. Tattoo-Associated Panuveitis

A | Keratic precipitates and iris nodule  
B | Inflammation and induration of tattoos  
C | Severe vitritis

A. Granulomatous keratic precipitates and large, granulomatous, vascularized iris nodule in the right eye. B. Inflammation and induration of tattoos coincident with worsening of uveitis. C. Slitlamp photograph showing that despite immunomodulatory therapy and fluocinolone acetonide implantation, the patient developed severe vitritis in each eye.
His course was marked by multiple attempts to taper prednisone, which failed owing to simultaneous recurrence of uveitis and tattoo induration (Figure 2B). The uveitis remained active (Figure 2C) despite aggressive management with regional corticosteroids in each eye, fluocinolone acetonide implantation in the left eye, and the following systemic combination: subcutaneous adalimumab, 40 mg weekly; cyclosporine, 100 mg daily; oral methotrexate, 12.5 mg weekly; azathioprine, 100 mg daily; and prednisone, 80 mg daily. The patient underwent vitreous biopsy of the right eye while receiving the systemic medications 7.5 years following symptom onset.

Flow cytometry of the vitreous specimen confirmed an atypical T-lymphocyte population (40%-60%) with increased CD8 expression as well as CD3 and CD56 coexpression. Concurrent cytology revealed marked atypia without granulomas (Figure 1B) not thought to be consistent with sarcoidosis. The specimen was negative for infectious organisms, including mycobacteria.

Given the concern for a lymphoproliferative disorder, all immunosuppression was discontinued and inflammation of the tattooed skin returned acutely. Repeated skin biopsy confirmed noncaseating granulomas with an atypical infiltrate but with results of T-lymphocyte gene rearrangement studies negative for lymphoma.

Following negative results on an evaluation for malignancy, the patient resumed treatment with prednisone, 80 mg daily, with which his uveitis abated and skin changes resolved. Best-corrected visual acuity is 20/30 OD and 20/60 OS.

Discussion | Tattoo-associated uveitis is believed to be due to a delayed allergic reaction to injected ink1 and is characterized by antecedent tattooing, tattoo inflammation, and contemporaneous intraocular inflammation.2–4 Many cases have been attributed to sarcoidosis5 because noncaseating granulomas are often seen on skin biopsy; however, as pulmonary involvement is uncommon, whether tattoo-related uveitis represents a distinct entity or a subset of cutaneous sarcoidosis remains unclear. In this case, vitreous biopsy was performed owing to persistent intraocular inflammation despite aggressive immunosuppression. The T-lymphocyte predominance and atypia without granulomatous inflammation in this patient’s vitreous are not typical of sarcoidosis and may represent chronic, partially treated inflammation or suggest that tattoo-associated uveitis is distinct from sarcoidosis. Additional histopathologic studies of this entity may provide further insight into disease pathogenesis and better define any link to sarcoidosis.

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Author Contributions: Drs Reddy and Shildkrot had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Reddy.
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OBSERVATION

CRB1-Related Maculopathy With Cystoid Macular Edema

Two identical twin sisters in their teens presented to the Inherited Retinal Degenerations Clinic at the Wilmer Eye Institute for evaluation of cystoid macular edema (CME), which had been treated intermittently with topical carbonic anhydrase inhibitors. Both girls were myopic from early childhood but denied any visual complaints such as night blindness or visual field constriction, and their family history was negative for retinal diseases or consanguinity.

Report of Cases | On her initial visit, twin 1 had best-corrected visual acuity of 20/40 OU; intraocular pressure, confrontational visual fields, pupillary reactions, and anterior segments were normal. Her dilated fundus examination revealed CME and mild mottling of the foveal retinal pigment epithelium in both eyes, but otherwise findings were unremarkable. Optical coherence tomography demonstrated foveal cystoid abnormalities in the inner and outer retina with secondary mild retinal thickening, coarse retinal laminar, and scattered central ellipsoid zone defects in both eyes. Fluorescein angiography did not reveal any leakage or any additional pathological finding in either eye. Autofluorescence imaging demonstrated a petaloid-like pattern of autofluorescence signals in the fovea and a ring of increased autofluorescence signals in the posterior pole (Figure 1).

Twin 2 had best-corrected visual acuity of 20/50 OU with more extensive cystoid abnormalities on optical coherence tomography, but otherwise had similar clinical and imaging findings as her sister.

Full-field electroretinography revealed normal rod function and moderately reduced cone function with normal implicit times of all responses in each eye of both twins.

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