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LETTER TO THE EDITOR

Clinical utility of pre-transplant ophthalmic consultation for lung transplant recipients: implications in the COVID-19 pandemic era

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Dear Editor,

A screening examination is among the most common ophthalmologic inpatient consultations in the hospital system [1]. Its indiscriminate practice has persisted for decades, though little is supported by evidence-based epidemiologic or outcomes data. Ophthalmologic screening for *Candida* bloodstream infections, for example, is historically engrained in medicine checklists, largely influenced by the Infectious Disease Society of America [2]. When reviewed systemically, however, asymptomatic screening did not demonstrate an association with better ophthalmic outcomes [3]. Only now are institutions altering guidelines related to this topic.

In this SARS-Cov-2 (COVID-19) era, many reflexive ophthalmologic screening examinations are undergoing increased scrutiny, and though the topic is not unique to the current pandemic; this process has spurred the reexamination of "essential" vs. "non-essential" interventions [1]. This reappraisal is especially pertinent for inpatient lung transplant patients, many of whom are acutely ill and immunocompromised. Pathogen transmissibility across ophthalmic equipment, for example, has resulted in infection and mortality in a similarly vulnerable group [4]. Globally, institution-specific guidelines that include pre-transplant eye examination remain a prerequisite to transplantation, even though justification for this evaluation is questionable [5, 6].

As part of an institutional-review board approved effort to identify non-essential interventions, we reviewed all lung transplant ophthalmologic consultations from 2014 to 2019 to determine their continued utility in the setting of the COVID-19 pandemic. In total, 154 consults were identified, 89 pre-transplant, and 65 post-transplant (Table 1). 94.8% of pre-transplant screening evaluations were asymptomatic on ocular review of systems. Average visual acuity was 20/32 ± 46 and average intraocular pressure was 14.5 ± 3.1 mmHg. No findings served as reasonable contraindications to acute lung transplantation (Table 2). Only 18/85 (21%) of patients received a lung transplant (mean 33.8 days post-consultation [12–98]), 43/84 (51%) were discharged after clinical improvement (mean 27.8 days post-consultation [1–243]), and 23/84 (27%) patients died (mean 16.6 days post-consultation [0–79]). Eleven patients (13.1%) were deemed ineligible due to poor health or psychosocial instability, after ophthalmologic evaluation. The remaining 65 consultations occurred on average 1.7 years (3 days–11 years) post-transplantation. 35/65 (52.3%) were symptomatic, with the most common complaints including blurry vision (20%), redness/eye pain (17%), and reduced vision (8%). Thirty-one consults were for asymptomatic screening examinations, such as cytomegalovirus bloodstream infection, of which 0% had relevant findings. 8/65 had non-benign ocular findings on examination; two vascular incidents, two with disc edema from diabetes and elevated intracranial pressure, three with medication-induced optic atrophy, and one with a visual field defect related to meningitis (Table 2). All 8 of these patients were acutely symptomatic.

Based on these data, the utility of an urgent pre-transplant examination in the inpatient setting appears impractical, as only 21% received a transplant during their hospitalization, and 0% had pertinent ophthalmic findings. There are also no set guidelines for routine ophthalmologic follow-up post-transplantation, which is problematic when recommending a pre-transplant evaluation, as any non-urgent pertinent positives (including cataract or steroid-induced glaucoma) may

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Table 1 Baseline patient demographics by consult (154 total)

	# of Consults
Gender	Male: 80
	Female: 74
Age (years)	Avg. 50.6 (15–75)
Ethnicity	Caucasian: 96
	Hispanic: 30
	African American: 5
	Asian: 3
	Unknown: 20
Diagnosis (lung)	Cystic fibrosis: 33
	Chronic obstructive pulmonary disease/emphysema: 14
	Interstitial lung disease: 42
	Pulmonary arterial hypertension: 10
	Idiopathic pulmonary fibrosis: 17
	Scleroderma/connective tissue disease: 8
	Sjogren's syndrome: 4
	Systemic lupus erythematosus: 2
	Primary ciliary dyskinesia: 1
	Usual interstitial pneumonia: 3
	Pulmonary embolus: 1
	Non-specific interstitial pneumonia: 4
	Idiopathic pleuroparenchymal fibroelastosis: 1
	Hypersensitivity pneumonitis: 1
	Hermansky-Pudlak: 2
	Other: 8
Admission	Transplant rejection: 6
	Acute on chronic respiratory failure: 65
	Post-transplant care: 16
	CMV viremia: 9
	Other infection: 18
	Cardiogenic: 9
	Altered mental status: 4
	Other: 27

Table 2 Pre- and post-transplant ophthalmic findings

Ocular findings	Pre	Post
None	41	26
Nuclear sclerosis	8	5
Posterior subcapsular cataract (PSC)	2	1
Trace nuclear sclerosis	9	4
Posterior vitreal detachment	0	3
Exposure keratopathy	0	4
Dry eye syndrome	3	3
Lattice degeneration	2	0
Vascular changes	5	4
Peripheral drusen	3	2
Retinal nevi	2	0
Ocular albinism	2	0
Retinal vascular incident	0	2
Optic neuropathy	0	3
Disc edema	0	2
Visual field defect	0	1
Other	16	9

not receive appropriate follow-up [7]. Additionally, none of the presumed "absolute contraindications" to transplantation, such as incidental ocular malignancy or asymptomatic intraocular infection, meet epidemiological screening criteria [3, 8]. Our data are similar to published numbers by Sere et al., who also found no ocular contraindications to lung transplantation (0/295), resulting in a systematic change to the national Dutch lung transplant program that no longer requires inpatient ophthalmologic screening [9]. Therefore, we support a symptom-based approach to both pre- and post-transplant consultation in order to minimize harm through unnecessary exposures and potential medication side effects (e.g., phenylephrine-induced reflex bradycardia) [4, 10]. As COVID-19 reshapes how physicians and institutions address certain care models, we expect additional, similar interventions to be re-evaluated in a data-driven fashion.

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