

## Case Report

# Lacrimal Glands: Size Does Matter!

Suyash Mohan, Amogh Hegde<sup>1</sup>, C. C. Tchoyoson Lim<sup>1</sup>

### ABSTRACT

A 40-year-old woman presented with vague headaches and blurred vision. Contrast-enhanced magnetic resonance imaging of the brain revealed bilaterally symmetrical diffuse enlargement of the lacrimal glands. A fine needle biopsy of the lacrimal gland was consistent with sarcoidosis. Although, isolated lacrimal gland involvement is rare, it may be the initial clinical presentation of sarcoidosis, as seen in this patient. Imaging plays a vital role in these unsuspected cases and careful evaluation of the lacrimal glands with dedicated thin section, fat suppressed, axial and coronal orbital imaging, may help identify a pathological cause and avoid a delay in diagnosis.

**Key words:** Lacrimal Gland, Magnetic Resonance Imaging, Sarcoidosis

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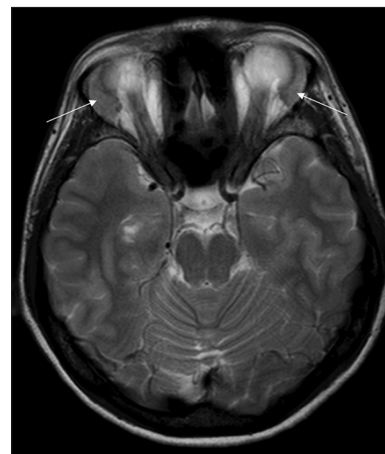


## INTRODUCTION

The lacrimal glands are unique structures possessing both epithelial and lymphoid tissue and may fall prey to an unusually wide range of pathologies including various neoplastic, infective, infiltrative, inflammatory and structural processes ranging from benign adenomas, adenocarcinomas, histiocytosis, benign dacrocysts and lymphomas to sarcoidosis.<sup>1</sup> Swelling and enlargement of one or both lacrimal glands remain the common denominator of most of these pathologies, suggesting size is an important factor in assessing the integrity of the lacrimal glands on most imaging studies.

## CASE REPORT

A 40-year-old Chinese lady presented with the history of vague headaches and blurring of vision bilaterally for three months. There was no other significant history. Magnetic resonance imaging (MRI) of the brain was performed as part of routine work-up for headache. No intracranial space-occupying lesions were detected; however, the lacrimal glands appeared diffusely enlarged [Figure 1]. A dedicated MRI study of the orbits was recommended, with thin section, fat suppressed, gadolinium-enhanced axial and coronal T1-weighted sequences, which showed bilaterally symmetrical diffuse enlargement of the

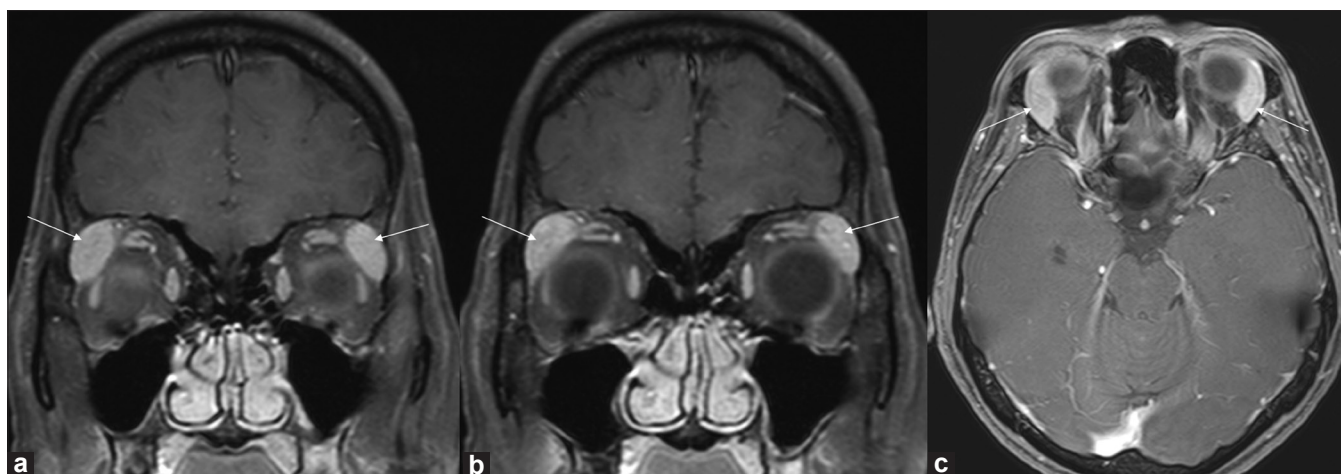


**Figure 1:** Axial T2-weighted image showing diffusely enlarged bilateral lacrimal glands

lacrimal glands [Figures 2a-c]. A fine needle biopsy of the right lacrimal gland was performed, which showed multiple well-formed non-necrotizing granulomas in the gland parenchyma with scattered multinucleated giant cells and lymphocytes. Acid-fast bacilli or fungi were not identified and there was no evidence of malignancy. The features of granulomatous inflammation were compatible with sarcoidosis. Other relevant laboratory investigations revealed an elevated angiotensin-converting

Department of Radiology, University of Pennsylvania School of Medicine, Philadelphia, PA, 19104, USA, <sup>1</sup>Department of Neuroradiology, National Neuroscience Institute, Singapore, 308433

**Corresponding Author:** Dr. Suyash Mohan, Assistant Professor Neuroradiology Division, Department of Radiology, University of Pennsylvania, Philadelphia, PA 19104. E-mail: [drsuyash@gmail.com](mailto:drsuyash@gmail.com)



**Figure 2:** Thin-section (3 mm), fat-suppressed, gadolinium-enhanced axial (a) and coronal (b, c) T1-weighted sequences, showing bilaterally symmetrical diffusely enlarged lacrimal glands showing intense homogenous enhancement

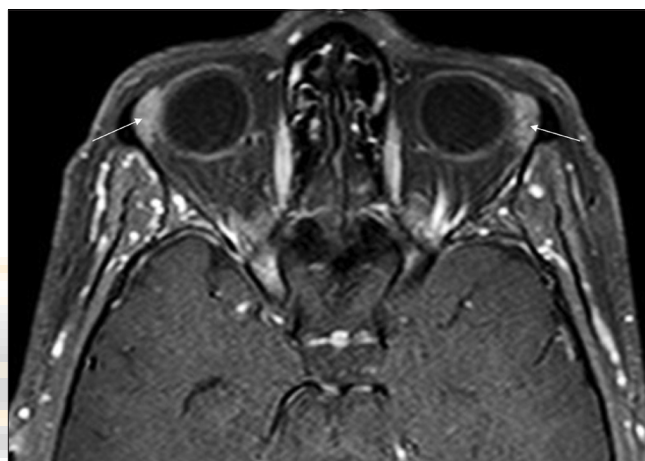
enzyme level of 71 U/L. Chest X-ray was within normal limits. No other systemic evidence of disease was found.

## DISCUSSION

The lacrimal gland is situated in the superotemporal aspect of the orbit, and is roughly the same size and shape as an almond, extraconal in position and extends deep into the orbital septum. This gland is anatomically related to the orbit but embryologically and functionally it is more closely related to the salivary glands. It is a unique structure possessing both epithelial and lymphoid tissue and as a consequence, it may be affected by an unusually wide range of pathologies including various neoplastic, infective, infiltrative, inflammatory and structural processes ranging from benign adenomas, adenocarcinomas, histiocytosis, benign dacryocysts and lymphomas to sarcoidosis.<sup>1</sup>

Ophthalmic involvement in sarcoidosis is frequent, with anterior uveitis being the most common manifestation, in up to 85% of patients.<sup>2</sup> Isolated clinically evident lacrimal gland involvement, with absence of systemic signs of the disease is rare and is reported in about 1.74% in one study.<sup>3</sup> These patients present with nonspecific neurologic signs such as headache,<sup>4</sup> as was seen in our case. In the absence of systemic evidence of sarcoidosis, accurate diagnosis may be difficult.

The most common imaging finding is smooth, homogenous, diffuse and nearly symmetrical enlargement of the lacrimal glands bilaterally. Although tumors and infection can cause lacrimal gland swelling they rarely do so bilaterally. Inflammation and infiltration are much more common causes of bilateral lacrimal gland swelling with sarcoidosis, lymphoma and leukemia being the prime differentials.<sup>5</sup> Diffusion-weighted imaging (DWI) can potentially help in differentiating lymphomatous infiltration from sarcoidosis, with restricted diffusion and low apparent diffusion coefficient (ADC) values in the former.<sup>6-9</sup>



**Figure 3:** Thin-section (3 mm), fat-suppressed, gadolinium-enhanced axial T1-weighted image, showing normal appearing lacrimal gland in a control subject

Other unusual differential diagnoses also include Kimura disease and primary lacrimal amyloidosis.<sup>10,11</sup> However, according to Mafee *et al.*,<sup>12</sup> bilateral diffuse enlargement of the lacrimal glands is highly suggestive of sarcoidosis.

On imaging, normal lacrimal gland measures approximately 4–5 mm in thickness [Figure 3].<sup>13</sup> In our case, both glands measured approximately 10–11 mm in maximum thickness. Izumi *et al.*,<sup>13</sup> have shown that measuring the thickness of the lacrimal gland correlates well with measures of the areas of the lacrimal gland thus supporting the analogy that ‘size does matter’.<sup>14</sup>

An objective measurement of the lacrimal gland is not required in the vast majority of cases and a visual assessment of gland size is sufficient. Dedicated orbital imaging with thin section, fat-suppressed, gadolinium-enhanced, axial and coronal sequences are fundamental to the optimal evaluation of lacrimal gland related pathologies.<sup>15</sup>

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