



## International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR | Volume 4 | Issue 4 | Oct - Dec - 2016  
www.ijamscr.com

Research article

Medical research

### Stone quarry of the eye!!

**AarthiPanneerselvam<sup>\*1</sup>, KanmaniKothandaraman<sup>2</sup>, PrabakaranTamilmani<sup>3</sup>**

*Resident, Department of Ophthalmology<sup>\*1</sup>, Saveetha Medical College & Hospital, Tamilnadu, India.  
Professor, Department of Ophthalmology<sup>2</sup>, Saveetha Medical College & Hospital, Chennai, Tamilnadu,  
India.*

*Resident, Department of General Medicine<sup>3</sup>, Saveetha Medical College & Hospital Chennai, Tamilnadu,  
India.*

**\*Corresponding Author: AarthiPanneerselvam**

**Email id: luckyaarthi@gmail.com**

#### ABSTRACT

A female child aged 8yrs presented with history of extrusion of small stone like particles from her lateral canthal region with minimal congestion, irritation and tenderness in her left eye for the past 1 month. Local antibiotics and anti inflammatory drugs did not improve the condition. Imaging tests were inconclusive because of periodic expulsion of the stony particles. The histopathological results were suggestive of amorphous material organized in lamellae, which confirmed the diagnosis of dacryolith. As the stone particles were spontaneously and periodically extruded, most probably through a ruptured duct to the conjunctival surface at the palpebral area, no active immediate intervention was contemplated. We are presenting this case because of the rarity and interest and hype associated with it.

**Keywords:** Dacryolith, Ruptureduct, Lacrimal gland.

#### INTRODUCTION

Dacryoliths of the lacrimal gland are also known as ophthalmolith, tearstone. The spontaneous extrusion of these stones might be due to localization of dacryolith in the dilated duct immediately beneath the conjunctival epithelium, rupture of this duct to the conjunctival surface may occur, resulting in expulsion of the stones. In this article we report a case of spontaneous extrusion of dacryolith in a girl child.

#### CASE PRESENTATION

A 9yr old female child presented to our OPD with complaints of spontaneous expulsion of stone

like particles from lateral aspect of her left eye for the past 3 months. (fig1, fig3) She complained of mild irritation and pain over the lateral aspect of her left eye. The stone like particles were firm in consistency and brownish in color and of 0.5 mm to 1mm in size. (Fig 2) The child was able to foretell the expulsion of stones. No significant past history and family history. The general examination of the child was normal. Visual acuity of both eyes was 6/6 and the anterior segment examination of both eyes were normal. On palpation over the lateral aspect of her left eye tenderness was present, no evidence of any swelling or mass over the lacrimal gland area. Orbital margins were well defined and

palpable. Patency of nasolacrimal duct and fundus

examination of both eyes were normal.



**Fig (1 & 2)**



**Fig 3**

## **INVESTIGATIONS**

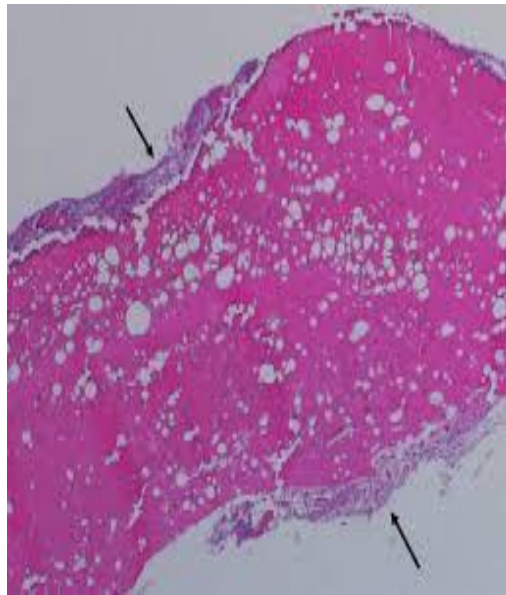
The patient was subjected to routine blood investigations which were normal. Radiological investigations were inconclusive due to periodic expulsion of stony particles at frequent intervals. Histopathological examination was done. Specimens were fixed in 4% buffered formaldehyde and embedded in paraffin.

The sections were stained with haematoxylin and eosin (HE). Periodic acid Schiff (PAS) and colloidal iron were used to demonstrate glycoprotein and mucous material, van Kossa to demonstrate calcified material. Brown and Hopps

Modified Gram stain to demonstrate bacteria and Grocott's stain together with PAS to demonstrate any fungal elements. Histopathological results confirmed that the particles consisted of amorphous material with surface inflammation

organized in lamellae which confirmed the diagnosis of dacryolith. (fig4) Analysis of the stone particles confirmed the composition as calcium oxalate. The stone particles were spontaneously and

periodically extruded most probably through a ruptured duct to the conjunctival surface at the palpebral area.



**Fig 4: HPE of the specimen showing amorphous eosinophilic material with vacoules and surface inflammation (marked in black arrow)**

## DISCUSSION

Dacryoliths of the lacrimal gland are concretions of the lacrimal gland also known as ophthalmolith, tear stone. Stones (dacryoliths) in the lacrimal drainage system are relatively common (Marthin et al. 2005), whereas stones in the lacrimal gland are very rare and very few have been published (Naito et al. 1973; Duke-Elder 1974; Baker & Bartley 1990; Baratz et al. 1991; Mawn et al. 1997; Zafar et al. 2004). Women are significantly more prone to developing stones in the lacrimal drainage system than men (Andreou & Rose 2002). (2) Lacrimal gland stones may be totally asymptomatic (Zafar et al. 2004). as found in our patient or symptomatic in few patients also presenting with severe pain and localized swelling of the lacrimal gland region and conjunctival injection and irritation over the lateral canthal area. (Baker & Bartley 1990) When a patient presents with a lesion in the lateral canthus, a tumour in the lacrimal gland should be suspected (Baker & Bartley 1990). However, when a patient presents with unilateral conjunctivitis around the canthal region, dacryoadenitis/ dacryoliths should also be considered.

The composition of dacryoliths in the lacrimal drainage system is well documented. In a study of Daxecker et al, histological and immunohistochemical examinations of dacryoliths revealed keratin antibodies; calcium, sulfur and some phosphorus were determined as major constituents in the chemical analysis. [4] Duke-Elder (1974) reported stones composed of calcified carbonates and phosphates, and Baker & Bartley (1990) found a stone with 90% albumin. In some cases, cilia have been identified in the core of a dacryolith (Baratz et al. 1991; Mawn et al. 1997). [4, 5]

Histopathological examinations in our patient disclosed eosinophilic amorphous material organized in lamellae and separated by vacuoles along with surface inflammation confirming the diagnosis of dacryolith and the stone analysis revealed the dacryoliths were made of calcium oxalate. The mechanism of dacryolith formation is attributed to initiating agents such as the epithelial debris from the glandular duct cells or condensation of albumin from the tear fluid [2]. Bacterial growth has been found around lacrimal gland stones. Baker & Bartley (1990) observed

Haemophilus influenzae [3] and Mawn et al. (1997) discovered Pseudomonas aeruginosae. However no accepted theory exists about the formation of dacryoliths, but some authors suppose dacryoliths are simply a secondary phenomenon, resulting from a lacrimal pathway obstruction. In our case scenario there was no evidence of any micro organism. Marthin et al. (2005) found dacryolithiasis in the lacrimal drainage system to be strongly associated with bacteria and noted that a significant preponderance of dacryoliths in the lacrimal drainage system are found in women. These authors proposed that cosmetics may act as a nidus for dacryolith formation by facilitating bacterial growth. [6] The possible mechanism in our case might be the dacryoliths lodged in the

lacrimal duct located beneath the conjunctival epithelium, may be extruded through a pre existing rupture in the duct resulting in spontaneous extrusion of the stone like particles. Stasis and swelling of the lacrimal gland duct leads to accumulation of debris and proteins which results in formation of stones. Surgical intervention might be needed when the patient presents with severe pain and swelling of the lacrimal gland ,however in our patient the complaints were limited to mild discomfort over the lateral aspect of the eyes and the radiological investigations were also inconclusive due to periodic expulsion of stones no active intervention was contemplated. We are presenting this case for the rarity and interesting clinical finding associated with it [1].

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**How to cite this article:** AarthiPanneerselvam, KanmaniKothandaraman, PrabakaranTamilmani. Stone quarry of the eye!!!. *Int J of Allied Med Sci and Clin Res* 2016; 4(3): 624-627.  
**Source of Support:** Nil. **Conflict of Interest:** None declared.