



## Epidemiological, Clinical and Tomographic Characteristics of Macular Holes in A Medical Office

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### Abstract

**Introduction.** - The macular hole has benefited in recent years from the advent of optical coherence tomography for its diagnosis. The aim of this study was to report the epidemiological, clinical and tomographic particularities in patients with a diagnosis of macular hole in CAMEROON.

**Patients and methods.** - Retrospective study of 9 patients (11 eyes) with macular hole. A complete ophthalmological examination, non-mydratic retinography and optical tomography were performed for all patients. The IVTS classification was used to characterize macular holes.

**Results.** - The mean age of the patients was 65.9 years [44 – 79 years]. The female gender predominated. The history of myopia and cataract surgery were found. The macular hole was unilateral in 6 patients. BCVA was 5/10. OCT showed a full-thickness macular hole in all cases. All patients had a macular hole larger than 400µm. According to the IVTS, the macular holes were large in all patients. The etiology was primary in 5 patients.

**Discussion.** - *The characteristics of macular holes in our study are strongly linked to the accessibility of ophthalmological health care in our region.*

**Conclusion.** - *Female sex and age over 60 years seem to be predisposing factors to the occurrence of macular hole in the Cameroonian territory. Large macular holes according to IVTS are the only ones found in our series.*

**Key words:** *macular hole, Optical coherence tomography, macula*

## Introduction

Macular hole (TM) is a lesion of the fovea that interrupts all layers of the retina ranging from the internal limiting membrane (ILM) to the retinal pigment epithelium (EP) [1]. In recent years, its diagnosis has greatly benefited from the advent of optical coherence tomography (OCT) [2]. In 2013, the International Vitreomacular Traction Study Group (IVTS) proposed a new simplified classification of macular holes [3]. The aim of this study was to report the epidemiological, clinical and tomographic particularities in patients with a diagnosis of macular hole in CAMEROON.

## Patients and methods

This is a retrospective study of 9 patients (11 eyes) who presented a clinical picture and a tomographic aspect of macular hole collected at the LA CERISAIE medical office (Douala, Cameroon) between June 2018 and December 2021.

The interrogation had specified the general and ophthalmological history. Each patient underwent a complete ophthalmological examination with measurement of visual acuity, ocular tone measurement, biomicroscope examination and fundus examination after pupillary dilation using a VOLK non-contact lens. Retinography and optical coherence tomography (OCT) were performed in all our patients. The classification of macular holes (TM) was carried out according to the criteria of the International Vitreomacular Traction Study group (IVTS) of 2013. The IVTS classification distinguishes three elements to characterize a full-thickness macular hole:

- the size

Small: < 250  $\mu\text{m}$

Medium: 250  $\mu\text{m}$  and < 400  $\mu\text{m}$

Large:  $\geq$  400  $\mu\text{m}$

- the presence or absence of vitreomacular traction (TVM)
- the etiology: primary (initiated by a TVM) or secondary (trauma or other pathologies)

The following data were collected: age, sex, history, affected eye, best visual acuity (BCVA) of the affected eye, size of the macular hole (TM) and the etiology found.

### Results

The average age of our patients was 65.6 years [44 – 79 years] with a female predominance (6 cases/9). Myopia was found in 3 patients. Ocular trauma was found in one patient (Table 1 – case 8). A history of cataract surgery was found in 2 cases. The right eye was the affected eye in 6 patients. BCVA was 5/10 with a minimum of 1/10. The involvement was bilateral in 2 patients (Table 1 – cases 5 and 6). Non-mydriatic retinography revealed a macular hole in all patients. OCT showed a full-thickness macular hole in all cases. The average size of macular holes was 729  $\mu\text{m}$  [416 – 960  $\mu\text{m}$ ]. The size of the macular hole was greater than 400  $\mu\text{m}$  in all patients. It was a large macular hole in all our patients. The etiology of the macular hole was primary in 5 cases and secondary in 4 patients.

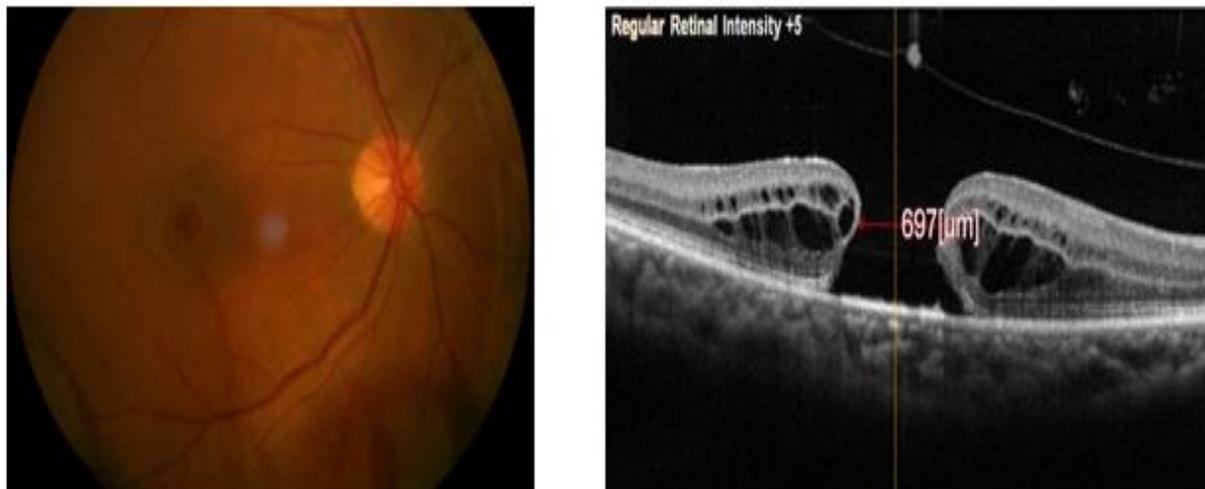


Figure 1. Rounded orange zone, with clear limits at the level of the macula (white arrow), detachment of the posterior hyaloid from the vitreous full-thickness opening in the center of the macula with a diameter of 697 $\mu\text{m}$ , microcystic thickening of the edges of the hole



Figure 2. Right eye of case 6.

**Table 1 Summary of ophthalmological examination of patients presenting in a macular hole table.**

Case	Age (Years)	Sex	Background	Affected eye	MAVC Affected Eye	Size of the TM (µm)	Etiology
1	65	F	Primary open-angle glaucoma	FROM	2/10	826	Primary
2	44	M	Myopia	FROM	2/10	746	Secondary
3	71	F	High blood pressure	AND	2/10	960	Primary
4	75	F	OG Cataract Surgery	AND	2/10	767	Secondary
5	72	F	Myopia	FROM AND	1/10 1/10	779 697	Primary
6	68	F	High blood pressure Hyperthyroidism	FROM AND	4/10 5/10	837 662	Primary
7	57	M	Macular Surgery OD Type 2 Diabetes	FROM	4/10	697	Primary
8	60	F	Right eye trauma Myopia Sparkling Synchisis	FROM	1/10	633	Secondary
9	79	M	OG Cataract Surgery High blood pressure Type 2 diabetes	AND	1/10	416	Secondary

**F: Feminine; M: Male; MAVC: Better corrected visual acuity; OD: Right eye; OG: Left eye; TM: Macular hole; TVM: Macular vitreous traction**

## Discussion

The prevalence of macular hole in the general population is low, varying from 0.02% to 0.8% [4] according to studies carried out mainly in developed countries. In Cameroon, apart from the studies that were generally interested in blindness, no study deals specifically with macular holes. OMGBA [5] found a prevalence of 0.2% macular hole among patients with blindness. AJAYI [6] in his study found a prevalence of 6.6% in the SOUTH-SOUTH region of Nigeria.

The female sex predominated in the study with 6 out of 9 patients and this constant predominance in the literature [6, 7, 8], suggested that the female sex was a predisposing factor [4].

The average age of our patients was 65.9 years, which is similar to the Nigerian [6] and Norwegian [8] studies which found an average age of 61 and 69.3 years respectively. Conversely BOUAZZA [9] found an average age of 51 years, this could be explained by the fact that his study focused specifically on idiopathic macular holes.

The antecedents of hypertension and diabetes were found in our patients, which is superimposed on the results of AJAYI [6], which found 23% of hypertensives and 2 diabetic patients. The study conducted in Nigeria found pseudophakia in one patient [6]. We had a higher number in our sample. Indeed, an incidence of macular hole in the pseudophakic has been reported, explained by the structural and biochemical modifications of the vitreous engendered during surgery.

The laterality of the attack was not very telling. In our series, involvement of the left eye was found in the majority of cases. Finally, 2 of our patients had bilateral involvement. It is described in the literature, a tendency to bilateralization in 10% of cases [4,6].

The collapse of visual acuity in the affected eye was found in all our patients. The BCVA was 5/10 in our sample and it was 3/10 in the BOUAZZA study [9].

The average size of the macular hole was 729  $\mu\text{m}$  in our series. CHANDRA [7] and FORSAA [8] found a much lower average of 434.6  $\mu\text{m}$  and 435  $\mu\text{m}$  respectively. This disparity could be explained by the difficulty of access to eye health care in our region. The costs of the ophthalmological consultation and the OCT examination amount to 15,000 CFA francs (about 23 euros) and 50,000 CFA francs (about 76 euros) respectively. These associated costs are much higher than the guaranteed interprofessional minimum wage (SMIG) in Cameroon, which is 36,270 CFA francs [10]. Added to this, the great disparity of practitioners and the distance from health facilities are elements that delay both the diagnosis and the care of patients. These cumulative factors would be at the origin of the large macular holes observed in our study.

Vitreomacular traction (TVM) is the most frequently found etiology [11,12]. The Nigerian [6] and Norwegian [8] studies with respective rates of 89.1% and 86% confirmed the data in the literature, and

the same was true for our sample. The other etiologies found were myopia [13], ocular trauma [6,8] and cataract surgery [6]. These secondary etiologies are found in our series as well as the British [7], Nigerian [6] and Norwegian [8] series.

### **Conclusion**

Macular hole is an infrequent and potentially blinding macular pathology. Vitreomacular traction is the primary cause of this condition. Knowledge of its tomographic appearance is an important aspect in its diagnosis and management.

### **Declaration of interests**

The authors declare that they have no conflicts of interest.

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