

# Spontaneous Closure of Macular Hole

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## ABSTRACT

We report a case of spontaneous closure of stage-II macular hole. A 66 years old lady presented with decreased vision in her left eye for the last 3 months. Her vision was 6/18 in right eye and finger counting at 3 feet in left eye. Optical coherence tomography showed stage-II macular hole in left eye. There was attachment of vitreous at the edge of the hole. Minimal hole diameter was 119 $\mu$ . Macular hole surgery was planned. During follow-up, hole started closing spontaneously. Nine months later, the hole closed and posterior hyaloid membrane separated from the macula. Visual acuity improved to 6/24. The purpose of this case report is to show that stage-II macular hole may close spontaneously with relief of vitreomacular traction.

**Key Words:** Stage-II macular hole. Optical coherence tomography. Visual acuity. Spontaneous closure vitreous attachment. Vitreomacular traction.

## INTRODUCTION

Idiopathic macular hole is one of the important causes of poor vision in old age group. Stage-II and worse is indication for macular hole surgery.<sup>1</sup> About 50% of stage 1 macular holes close spontaneously.<sup>1</sup>

Uncommonly idiopathic full thickness macular hole can close spontaneously.<sup>2</sup> Without treatment 4 - 6% full thickness macular holes close spontaneously.<sup>3</sup> Release of vitreofoveal traction or glial proliferation may be the factors leading to spontaneous closure of macular hole.<sup>4</sup> Spontaneous macular hole closure may occur in stages 2, 3 and 4. Vision can improve in spontaneous macular hole closure of any stage.<sup>5,6</sup>

Here we describe a case of spontaneous closure of stage-II macular hole and this was accompanied by improved visual acuity.

## CASE REPORT

A 66 years old lady presented to the outpatient department with complaint of decreased vision in her left eye for the last 3 months. There was no history of trauma or previous ocular surgery. The patient was hypertensive with good control. Her vision was 6/18 in right eye and finger counting at 3 feet in left eye. There were bilateral cataracts. There was nuclear sclerosis + 2 on both sides. There was mild posterior sub-capsular cataract on both sides. On dilated fundus examination, there was a left macular hole. This was confirmed on optical coherence tomography (OCT). There was a full thickness stage-II macular hole with cystic spaces at the

margins of the hole. Minimal hole diameter was 119 $\mu$ . Posterior hyaloid membrane and pseudo-epithelium were adherent to the edges of the hole (Figure 1a). The patient was counseled and she was advised left macular hole surgery. Repeat OCT was performed 3 months later, before the scheduled surgery. At that time, the dimensions of hole were found to be less than before. Vitreofoveal tractions were less strong than the first scan. The hole was closing spontaneously (Figure 1b). After discussing with the patient the benefits and risks of observation versus surgery, we decided to observe. Repeat OCT scan, 6 months after initial presentation, revealed further closure of macular hole. There was still vitreofoveal traction (Figure 1c). There was no visual improvement. OCT was repeated 9 months after the initial presentation and complete closure of macular hole was found with complete separation of vitreofoveal traction (Figure 1d). Left eye vision improved and it was 6/36. Eleven months after initial presentation, the macular hole was completely closed. There was no vitreofoveal traction. There was restoration of normal foveal architecture (Figure 1e). Vision was 6/24. We have planned to do cataract surgery in both eyes and expect further improvement in vision after cataract extraction.

## DISCUSSION

Stage-II and worse macular hole tend to increase in size with deterioration of visual acuity if left untreated. In uncommon instances, full thickness macular holes show spontaneous closure with improvement in vision.

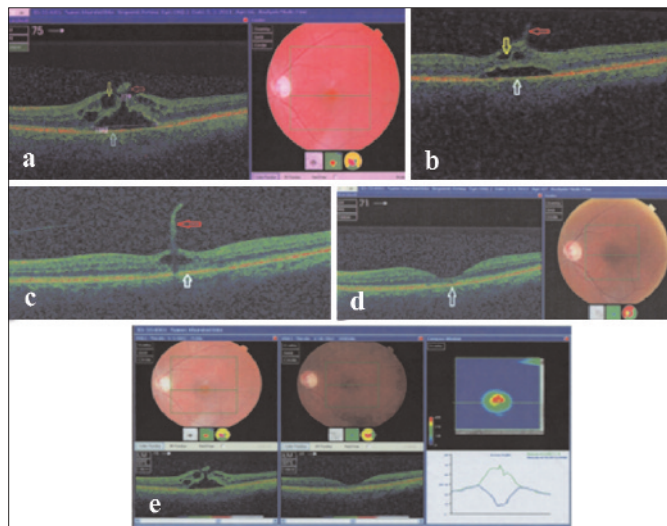
In one study done by Inoue and co-authors, macular holes closed spontaneously within 1 - 4 months after the initial examination and maximum visual acuity was gained within 9 months of spontaneous closure of macular hole.<sup>3</sup> In the present case, macular hole started to close at 3 months and closure was complete 9 months after the initial presentation.

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**Figure 1 (a,b,c,d,e):** Optical coherence tomographic image of macular hole during follow-up.

There is left eye stage 2 macular hole. Red arrow points to the pseudo-operculum. Yellow arrow shows cystic spaces at the edges of the hole. White arrow is indicating defect of photoreceptors.

(a) is baseline OCT scan. Minimal aperture diameter of hole is 119µ and basal diameter is 1552µ.

(b) is OCT scan at 3 months follow-up. Macular hole has started closing spontaneously. There is closure of the hole at the aperture. Vitreofoveal traction is present but is relieving (red arrow). Cystic spaces are less marked (yellow arrow). Photoreceptor defect is present (white arrow).

(c) is OCT scan at 6 months follow-up. There is further closure of macular hole. Vitreofoveal traction is relieving.

(d) is OCT scan at 9 months follow-up. Complete closure of macular hole is achieved. There is complete posterior vitreous detachment. Foveal contour is restored. Photoreceptor layer is reformed. There are some defects in photoreceptor layer.

(e) is comparison between baseline and 11 months follow-up.

There are several hypotheses as how spontaneous closure of macular hole is achieved. Release of vitreous traction is the most widely accepted mechanism for spontaneous closure of macular hole.<sup>5</sup> In this case, this was the probable mechanism of hole closure.

Shrinkage of epiretinal membrane, retinal pigment epithelial or glial cell proliferation and bridging of retinal tissue over macular hole are other postulated mechanisms responsible for spontaneous closure.<sup>3</sup>

Macular holes with small minimum diameter of less than 400µ show greater ability to close spontaneously.<sup>5</sup> This case showed minimum hole diameter of 119µ.

Spontaneously closed macular holes may show defects in the junction of inner segments and outer segments of photoreceptor. This defect is improved with passage of time in most of the cases.<sup>5</sup> Those cases that show delayed or incomplete recovery of photoreceptor defect, fail to gain substantial improvement in visual acuity.<sup>3</sup> In this case, the photoreceptor layer showed improvement in architecture with passage of time and it was associated with improved visual acuity. But there were some residual defects in photoreceptor layer. In this case, baseline visual acuity was finger counting at 3 feet in left eye. It was due to full thickness macular hole with cystic spaces in the edges of the hole. Nine months later, macular hole was closed and now visual acuity was 6/24. Although vision was improved but it was not normal; it might be due to the residual photoreceptor defects and cataract.

It is possible to gain completely normal macular micro-architecture with spontaneous closure of macular hole. But it is not recommended to delay surgery in the hope of spontaneous closure of macular hole. Delay in surgery may affect the visual outcome.

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