

## INTRODUCTION

Neurofibromatosis type I (NF1) is an autosomal dominant genetic disease caused by a defect in NF1 gene<sup>1</sup>. The best-known clinical features are *cafe-au-lait* spots and cutaneous neurofibromas<sup>1</sup>. Ophthalmic manifestations of NF1 include *Lisch* nodules, choroidal hamartomas, eyelid neurofibromas, putative conjunctival neurofibroma, prominent corneal nerves, glial tissue overlying the optic disc, and optic pathway glioma<sup>2</sup>. Recently, another ocular finding was reported in patients with NF1, *Yasunari* nodules, which are choroidal lesions undetectable by simple fundus examination but visible by nir-infrared photography<sup>3</sup>. We report a patient with NF1 whose fundus examination was unremarkable but displayed *Yasunari* nodules on nir-infrared (NIR) imaging<sup>4</sup>.

## PURPOSE

The present investigation aims to show the detection of *Yasunari* nodules, for the diagnosis of neurofibromatosis, through infrared NIR image.

We report a patient with NF1 whose fundus examination was unremarkable but displayed *Yasunari* nodules on nir-infrared Imaging.

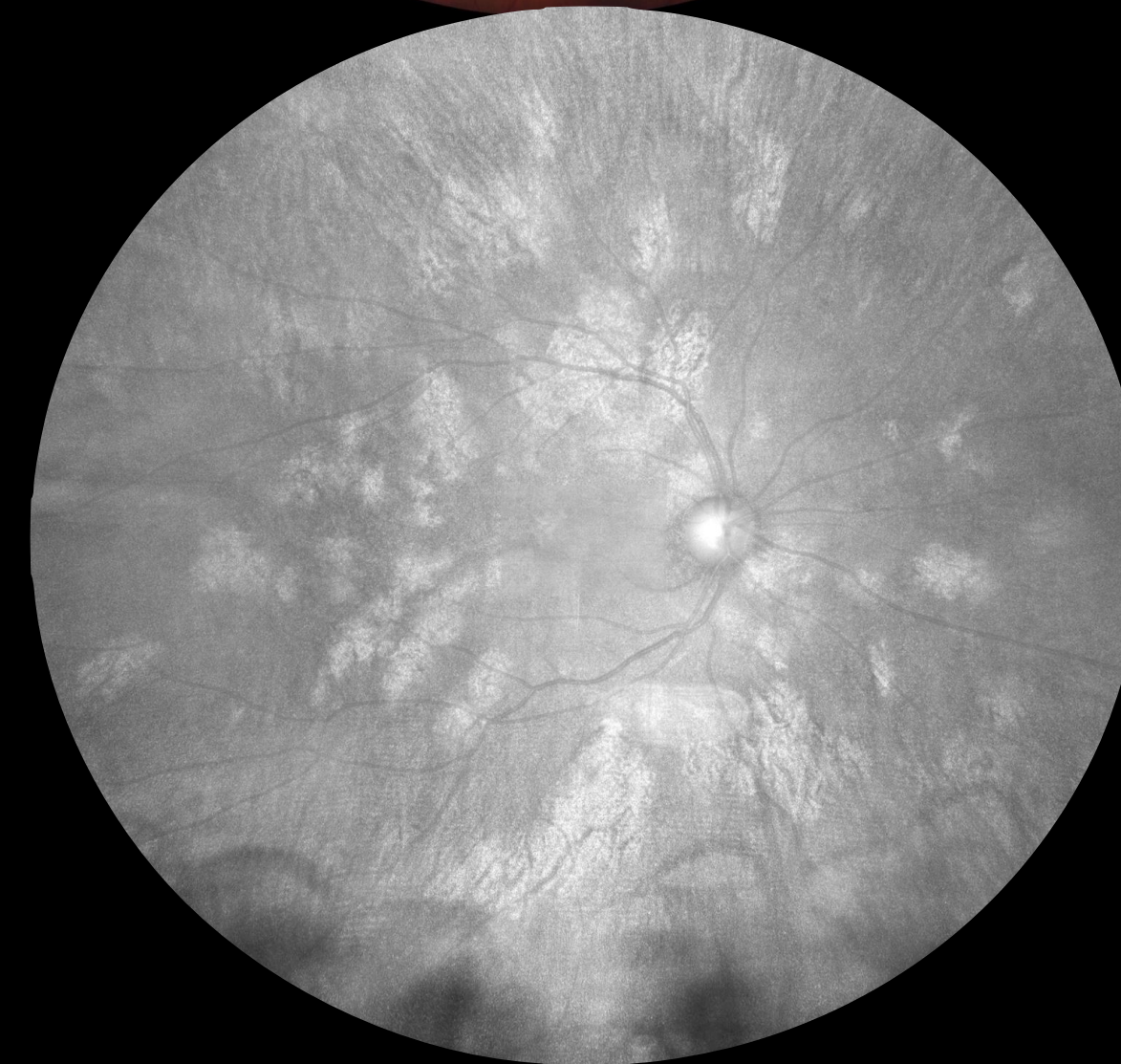
## CASE REPORT

A 25-year-old male patient complained of decreased visual acuity in the left eye. Examination revealed rhegmatogenous retinal detachment (RD), and a posterior band vitrectomy was performed. A postoperative multimodal evaluation, including infrared fundoscopy, revealed the presence of irregular and thin regions in the posterior pole, suggestive of *Yasunari* nodules in both eyes. Furthermore, the patient presented clinical characteristics suggestive of neurofibromatosis, such as “*cafe au lait*” spots on the neck and chest. When performing color fundus retinography, no changes were identified in the right eye and only those compatible with DR were seen in the left eye. Already, in the NIR analysis, changes suggestive of *Yasunari* nodules were identified. We determined their existence based on a minimum of two hyperreflective choroidal spots, following the recommendation of *Viola et al*<sup>4</sup>.

A



B



**FIGURE A:** Color fundus of the right eye with no changes detected.  
**FIGURE B:** Nir-infrared (NIR) imaging showing well-defined, bright, patchy choroidal abnormalities.

## DISCUSSION

*Yasunari* nodules, which are asymptomatic choroidal lesions of unknown etiology, may serve as an alternative diagnostic criterion for the diagnosis of neurofibromatosis<sup>1,2</sup>. These nodules are characterized by neoplastic proliferations of *Schwann* cells arranged concentrically around the axons<sup>3</sup>. On optical coherence tomography (OCT), *Yasunari* nodules appear as hyperreflective choroidal lesions that may correspond to nodules compressing the overlying choroidal vessels<sup>3</sup>. Therefore, a multimodal evaluation with OCT and nir-infrared photography is important for patients with suspected NF1<sup>1,4</sup>. The use of nir-infrared (NIR) reflectance imaging on the retina provides enhanced visualization of structures in the outer retina, retinal pigment epithelium, and choroid<sup>4</sup>. This method offers several advantages, including easy acquisition when combined with structural spectral domain optical coherence tomography. Furthermore, it provides greater comfort to patients, along with superior contrast and spatial resolution. The application of NIR imaging is crucial in diagnosing chorioretinal diseases with minimal fundoscopic findings and is equally valuable for monitoring various chorioretinal conditions<sup>5</sup>. When performing NIR, it is possible to visualize the characteristics of the choroid, identify areas of poor vascular perfusion and assess the presence of lesions, nodules or anomalous vessels<sup>6</sup>. This is essential for diagnosing and monitoring various eye diseases<sup>4-6</sup>. Using nir-infrared light offers some advantages as this radiation can penetrate deeper into the ocular tissues compared to visible light<sup>4</sup>. NIR remains underutilized despite its accessibility as a diagnostic test capable of identifying systemic conditions such as NF1. So, we believe that because it is an easy exam, it should be used more in the practice of multimodal assessment. This case shows the importance of multimodal assessment of the retina as the diagnosis of NF1 was only made after NIR infrared and NIR infrared reflectance exams. This shows that, despite being easy to perform exams, they are still little used in ophthalmology practice. Furthermore, it is important to view the individual as a whole, as ophthalmological changes, in this and in many cases, are a reflection of a systemic condition.

## REFERENCES

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