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## PURPOSE

Report a successful treatment of a high myopic patient with macular detachment caused by an internal macular hole using macular buckle.

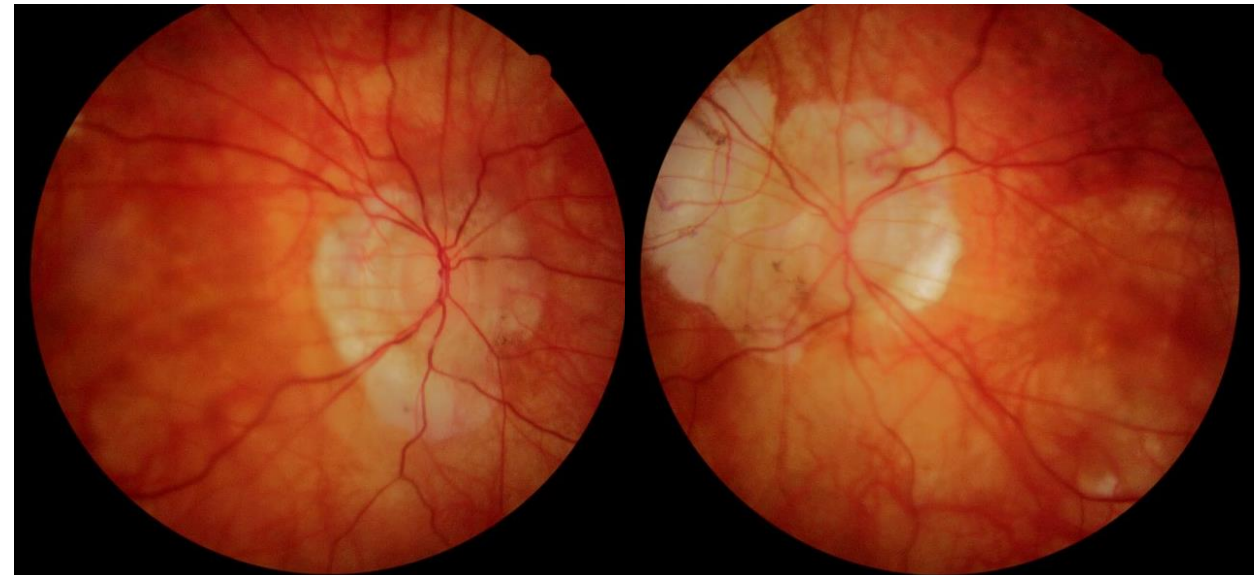
## CASE REPORT

A sixty-year-old woman with -28,0 spherical diopters myopia presented with visual loss in left eye (OS). Corrected visual acuity was 20/40 in right eye (OD) and counting fingers in OS. Biomicroscopy showed mild cataracts, while fundoscopy revealed myopic crescent and posterior staphyloma in both eyes (OU) as detailed in **Image 1**.

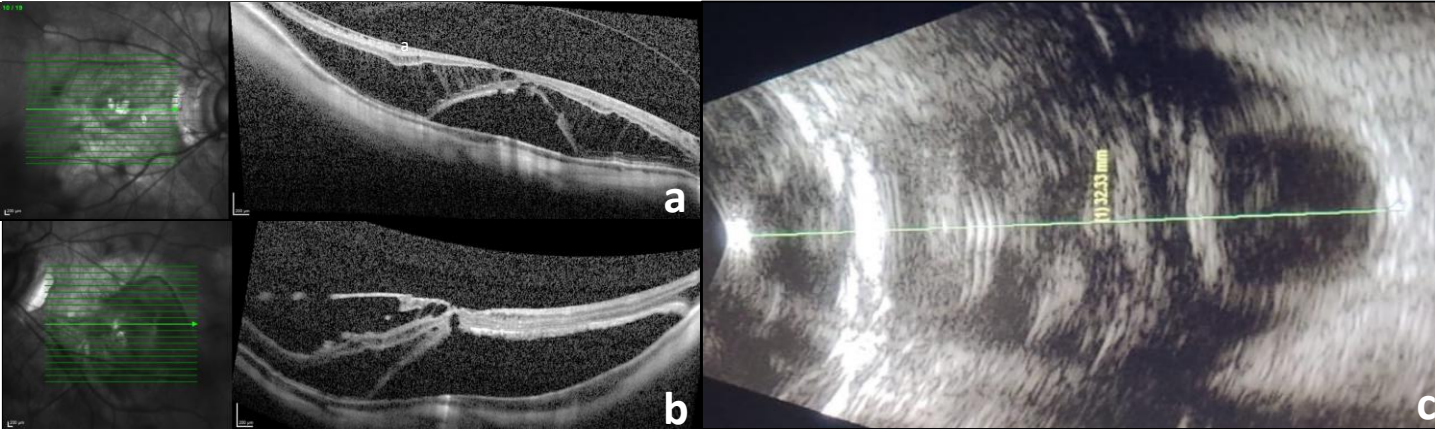
OCT further identified small internal macular hole in OU, while OS also exhibited foveoschisis, macular detachment and macular vitreoretinal traction (**Image 2a,b**). Ultrasonography (USG) confirmed a posterior staphyloma with an anteroposterior diameter of 32.33mm in OS (**Image 2c**).

Facing the presence of an internal macular hole in both eyes was proposed macular buckling for the left eye (worse visual acuity) and observation to the right eye. Surgery consisted of 360-degree peritomy, repair of the four rectus

muscles with polycoat 2.0, introduction of the L-shaped macula buckle (constructed as described by Parolini et al., 2013: titanium plate coated with a sleeve and finished with a 506G sponge) through the superior temporal quadrant. Finally, a chandelier light probe was placed in the lower quadrant 3.5mm from the limbus, and the right position of the buckle (under the macula) was confirmed. Then the it was suture at the sclera with 5.0 mersilene (Ethicon, Johnsons), and covered with the Tenon and conjunctiva, sutured with 7.0 vicryl (Ethicon, Johnsons).

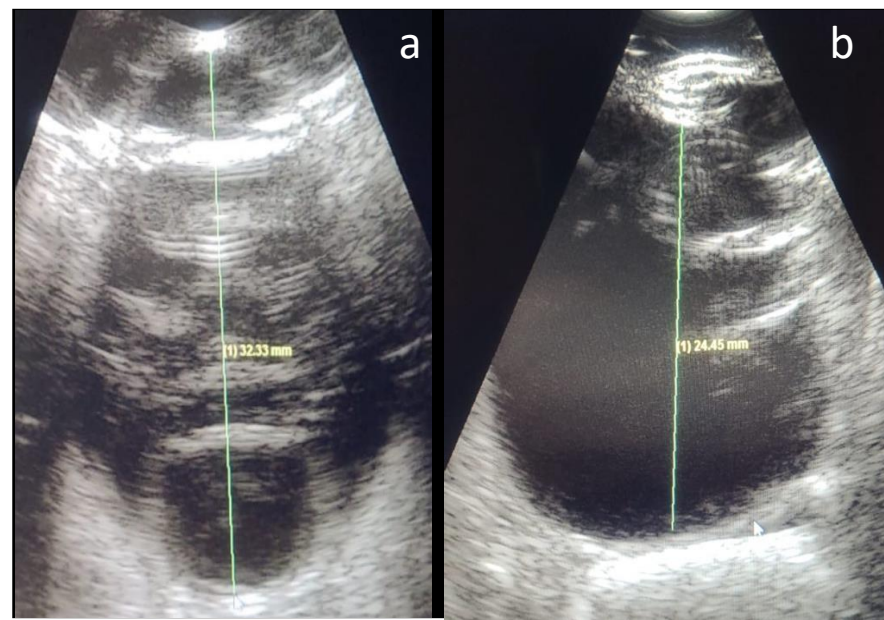


**Image 1:** conventional color retinography shows myopic crescent, diffuse rarefaction of the retinal pigment epithelium, and posterior staphyloma.



**Image 2:** (a,b) At OCT is possible to identify the presence of a foveoschisis, macular detachment with an internal macular hole and a traction over the macular area due to a posterior hyaloid traction in OS. A posterior staphyloma and a small internal macular hole was also seen in OD. (c) Ultrasonography (USG) shows a posterior staphyloma with an anteroposterior diameter of 32.33mm in OS.

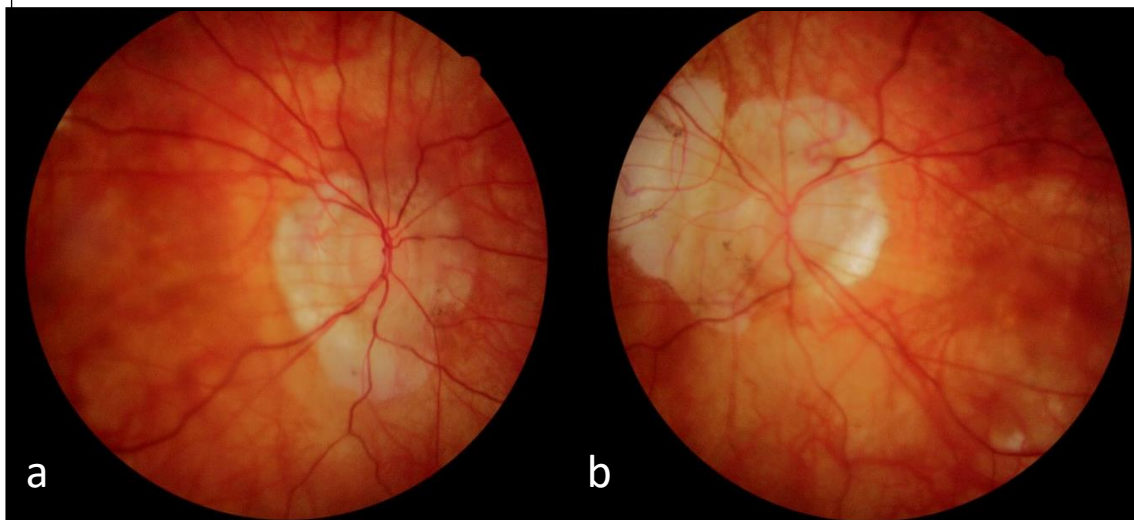
Per-operative USG was performed showing a correct positioning of the macular buckle and a significant reduction in the anteroposterior diameter (baseline: 32.33mm, during the surgery: 24.45mm) (**Image 3**).



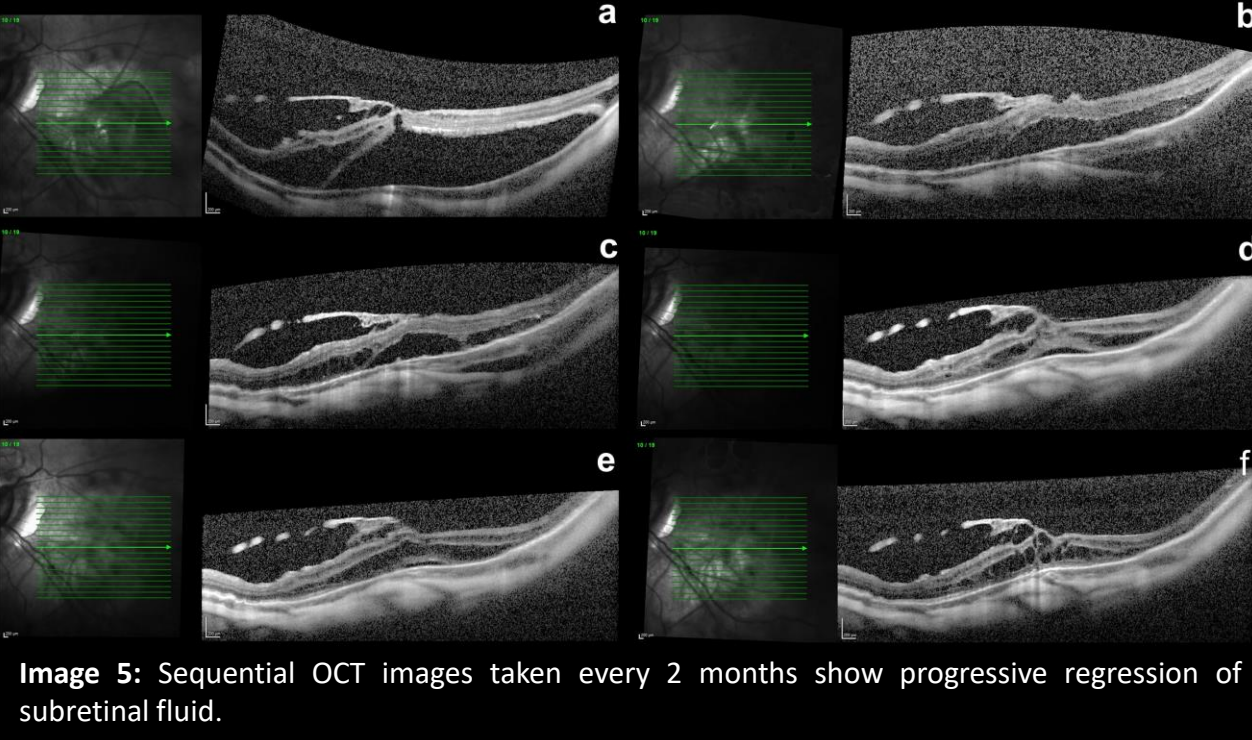
**Image 3:** Ultrasound images show the reduction of the axial length of the OS after macular buckle surgery. It is possible to observe the device well positioned behind the eyeball.

On the first day after surgery, no signs of inflammation were seen, and there was no significant pain; there was no diplopia or movement restriction; retina was attached. However, a choroidal hemorrhage was seen, but resolved spontaneously (**Image 4**)

During the follow-up, there was a progressive reabsorption of intraretinal fluid with progressive improvement of the internal hole over the months of follow-up. With one year of follow-up, it was already observed almost complete resolution and visual acuity of 20/100 in the OS. (**Image 5**)



**Image 1:** conventional color retinography shows myopic crescent, diffuse rarefaction of the retinal pigment epithelium, and posterior staphyloma.



**Image 5:** Sequential OCT images taken every 2 months show progressive regression of subretinal fluid.

## DISCUSSION

Macular buckling (MB) is a surgical technique that involves the placement of a silicone implant on the sclera, behind the eyeball for posterior apposition of the sclera of the macular region, inducing a localized inward indentation of the globe, with the aim of repositioning the macula and treating macular holes or macular detachment<sup>1</sup>. Gass in 1969, introduced MB as a treatment for macular holes and the technique involved creating a scleral buckle around the macular area to close the macular hole. Later, several authors adapted the technique to treat macular detachment, macular foveoschisis, lamellar, and/or full-thickness macular holes with macular detachment, failure vitrectomy for macular traction maculopathy

due to posterior staphyloma, helping to reduce the retinal traction and allowing the retina to reattach<sup>2,3</sup>.

Parolini et al. (2013) reported the outcomes of macular buckling in 22 eyes of patients with high myopia and macular holes. The study showed that macular buckling was effective in closing the macular hole in 81.8% of the eyes, with a significant improvement in visual acuity<sup>4</sup>.

MB is associated with a low rate of complications, as postoperative inflammation, pain, restriction of ocular motility and diplopia, increased IOP, macular subretinal hemorrhage, hemorrhagic choroidal detachment, late explant exposure or late change in explant position. Also, it was a less invasive alternative to vitrectomy<sup>3,5</sup>.

In this case, choroidal hemorrhage was observed on the first day after surgery. It was probably due to a significant reduction of the posterior staphyloma (7,8mm) after placement of the macular buckle, but it resolved spontaneously.

The majority of cases of subretinal fluid can be reabsorbed within six months, while a small number of cases may experience a slow reabsorption of subretinal fluid as seen in this case, where there is still a small amount of fluid one year after the procedure. This may be due to the compression of the choroid or failure of the retinal outflow mechanisms as proposed by Mateo et Burés-Jelstrup (2016) or because of the high viscosity of the subretinal fluid<sup>6</sup>.

## CONCLUSION

Macular buckling is considered a viable alternative to vitrectomy, especially in cases of internal macular holes, small holes, and minimal retinal detachment or foveoschisis. In such cases, macular buckling is considered less invasive than vitrectomy, releasing macular traction, and it can preserve the normal vitreous structure, positively impacting good visual outcomes with a low rate of complications, contributing as a less invasive alternative to vitrectomy.

## REFERENCES

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