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SHORT COMMUNICATION

Vitrectomy and silicone oil tamponade for serous macular detachment associated with an optic disk pit

P.M. FANTAGUZZI, A. VASCO

Department of Ophthalmology, L. Pierantoni Hospital, Forlì (FC) - Italy

PURPOSE. *Description of the results of vitrectomy and silicone oil tamponade to repair serous macular detachment associated with optic disk pit.*
DESIGN. *Interventional case report.*
METHODS. *The authors report on a 17-year-old girl with serous macular detachment with a very thin layer near the fovea which clinically simulated a lamellar macular hole and macular schisis associated with an optic disk pit. The patient underwent pars plana vitrectomy with posterior hyaloid removal and silicone oil tamponade.*
RESULTS. *Good anatomic and functional results were obtained after 1 year of follow-up.*
CONCLUSIONS. *This surgical approach may be a valuable technique for the surgical management of serous macular detachment associated with an optic disk pit. (Eur J Ophthalmol 2006; 16: 330-4)*

KEY WORDS. *Macular detachment, Macular schisis, Optic disk pit, Silicone oil tamponade*

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INTRODUCTION

The optic nerve head pit is a rare congenital anomaly of the optic nerve head, likely caused by an imperfect closure of the upper end of the embryonic fissure. The optic nerve head pit is also considered to fall within the spectrum of atypical optic nerve colobomas, a group of cavitary lesions for which the embryologic basis is unclear. This congenital defect remains asymptomatic until a macular involvement appears. The macula is affected by a neurosensory serous detachment, which can be associated with macular schisis, lamellar or full thickness macular hole (1), and retinal pigment epithelial (RPE) atrophy (2).

We describe a serous macular detachment with a very thin layer near the fovea which clinically simulated a lamellar macular hole and macular schisis, associated with the optic nerve head pit, treated with vitreoretinal surgery and silicone oil tamponade.

Case report

A 17-year-old girl had a sudden reduction of visual acuity in the left eye over the last 20 days. She had no significant medical history.

The vision was 20/20 in the right eye and 20/800 in the left eye. Slit-lamp biomicroscopy of anterior segment was unremarkable in both eyes.

The right fundus was healthy. The fundus in the left eye showed optic nerve head pit situated on the temporal rim and macular elevation with an apparent lamellar macular hole (Fig. 1, A and B). There was a slight retinal canal elevation visible near the posterior pole, which joined the temporal part of the optic nerve to the macula. The fundus biomicroscopy showed no posterior vitreous detachment.

Optical coherence tomography (OCT) through the central macula highlighted a serous neurosensory retina detachment, a schisis-like splitting in the internal layers of the reti-

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na in the same region, and also a very thin retinal layer near the fovea which clinically simulated a lamellar macular hole (Fig. 1C). The posterior hyaloid was adhered to the retinal surface. Furthermore, the OCT scan through optic disc highlighted a depression near the temporal optic nerve head, corresponding to the pit, and a retinal schisis near the peripapillary area (Fig. 1D). Fluorescein angiography (FA) detected the presence of a cilioretinal artery and pointed hyperfluorescence in the central macula, which was constant in all the fluorescein angiograms, with a window defect of the RPE (Fig. 1E). The patient underwent surgery in the left eye 2 months after the first visit.

A standard three-port pars plana vitrectomy was carried out together with the posterior hyaloid. Then we started laser photocoagulation treatment in the peripapillary temporal retinal region, but it was immediately interrupted because there was no visible blanching of the retinal surface at the impact point. A fluid/air exchange with simultaneous drainage of subretinal fluid from the pit and air/silicone oil exchange was then carried out. The silicone oil was removed 3 months after the first surgery with active pars plana sucking.

One week before the silicone oil removal and 3 months after the first operation, the apparent lamellar macular hole was not visible during the fundus examination and the retinal elevation in the macula was remarkably reduced (Fig. 1F).

Visual acuity was 20/40 9 months after the first surgery (6 months after the silicone oil removal). The fundus showed that the retina was flat in all the quadrants with a slight neurosensory elevation in the superotemporal macular seat (Fig. 2A). The objective ophthalmoscopic examination was confirmed by OCT (Fig. 2C), which also showed that the peripapillary retinal schisis was no longer present (Fig. 2E). Furthermore, the fundus showed chorioretinal scars located in the temporal margin of the optic disk that have been produced by the application of light coagulation.

Visual acuity is 20/32 after 1 year of follow-up. The fundus examination showed the disappearance of the apparent lamellar macular hole and the complete flattening of the macula (Fig. 2B). OCT confirms the resolution of the peripapillary and macular schisis (Fig. 2, D and F).

DISCUSSION

In cases of macular detachment associated with optic nerve head pits, there is no surgery approach at present, due to the unknown pathogenetic mechanism. There are various theories that could account for the cause of the macular detachment and the origin of the subretinal fluid in these cases: cerebrospinal derivation, leakage from vessels at the base of the pit, and tractional forces of the vitreoretinal interface with fluid movement from the vitreous into the subretinal space.

Akiba et al (3) highlighted biomicroscopically an anomalous Cloquet's canal, which adheres posteriorly near the colobomatous pit. During the ocular movements, the oscillation of the anomalous Cloquet's canal causes some pulsatile tractions and movements on the membrane covering the pit; from this observation, the authors assume that the vitreous traction plays a fundamental role in the onset of the macular detachment, in relation to the production of the micro-hole defects in the membrane overlying the optic pits, where the vitreous liquid reaches the subretinal space.

The vitreous pathogenetic theory of the macular detachment remains the most reliable, considering the good results quoted in literature after vitrectomy and gas-fluid exchange (4). Other authors (5) believe it is essential in these cases to remove all the vitreoretinal adhesions by peeling of the internal limiting membrane and laser treatment of the peripapillary area. Good surgical results have been described with the macular scleral buckling procedure (6).

The elective treatment for macular hole is vitrectomy and gas tamponade followed by face-down positioning of the patient, waiting for the gradual gas reabsorption in the postoperative phase. However, some authors (7) have recently demonstrated similar results for macular holes using silicone oil and no face-down position.

In our case, besides the macular detachments and macular and peripapillary schisis, there was also a very thin retinal layer near the fovea, caused by the chronic retinal detachment, which clinically simulated a lamellar macular hole, presumably as a consequence of the evolution of the macular schisis. There was also an initial dystrophy of the RPE on FA, caused by the chronic subretinal fluid. We thought it appropriate to carry out a complete vitrectomy with removal of the posterior hyaloid, in order to remove the vitreous tractions on the colobomatous pit and on the macular region. Furthermore, we chose silicone oil as the internal tamponade, to avoid a forced and prolonged face-down position of the patient during post surgery and, most of all, to obtain a long-acting tamponading effect near the posterior pole, at the same time. The disadvantage was the need to intervene 3 months after initial surgery, to remove the oil.

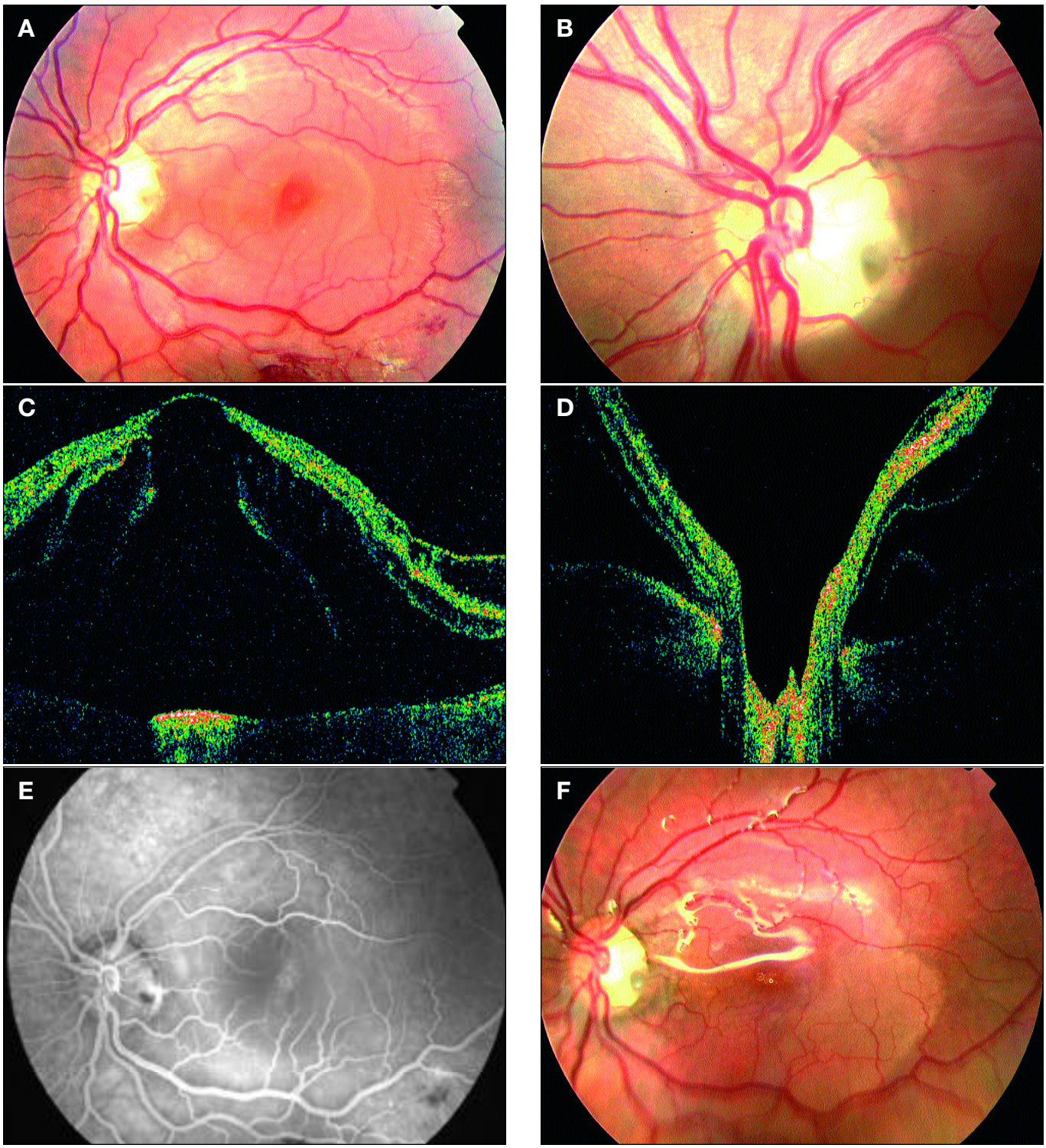

Fig. 1 - (A, B) *Optic nerve head pit and macular elevation with apparent lamellar macular hole.* **(C)** *OCT scan through macula showed: serous macular detachment, macular schisis and also a very thin retinal layer near the fovea which clinically simulated a lamellar macular hole* **(D)** *OCT scan through optic disk showed: retinal schisis near the peripapillary area.* **(E)** *Fluorescein angiography detected the presence of a cilioretinal artery and an initial dystrophy of the RPE.* **(F)** *Three months of follow-up: the apparent lamellar macular hole was no longer visible and the macula elevation was remarkably reduced.*

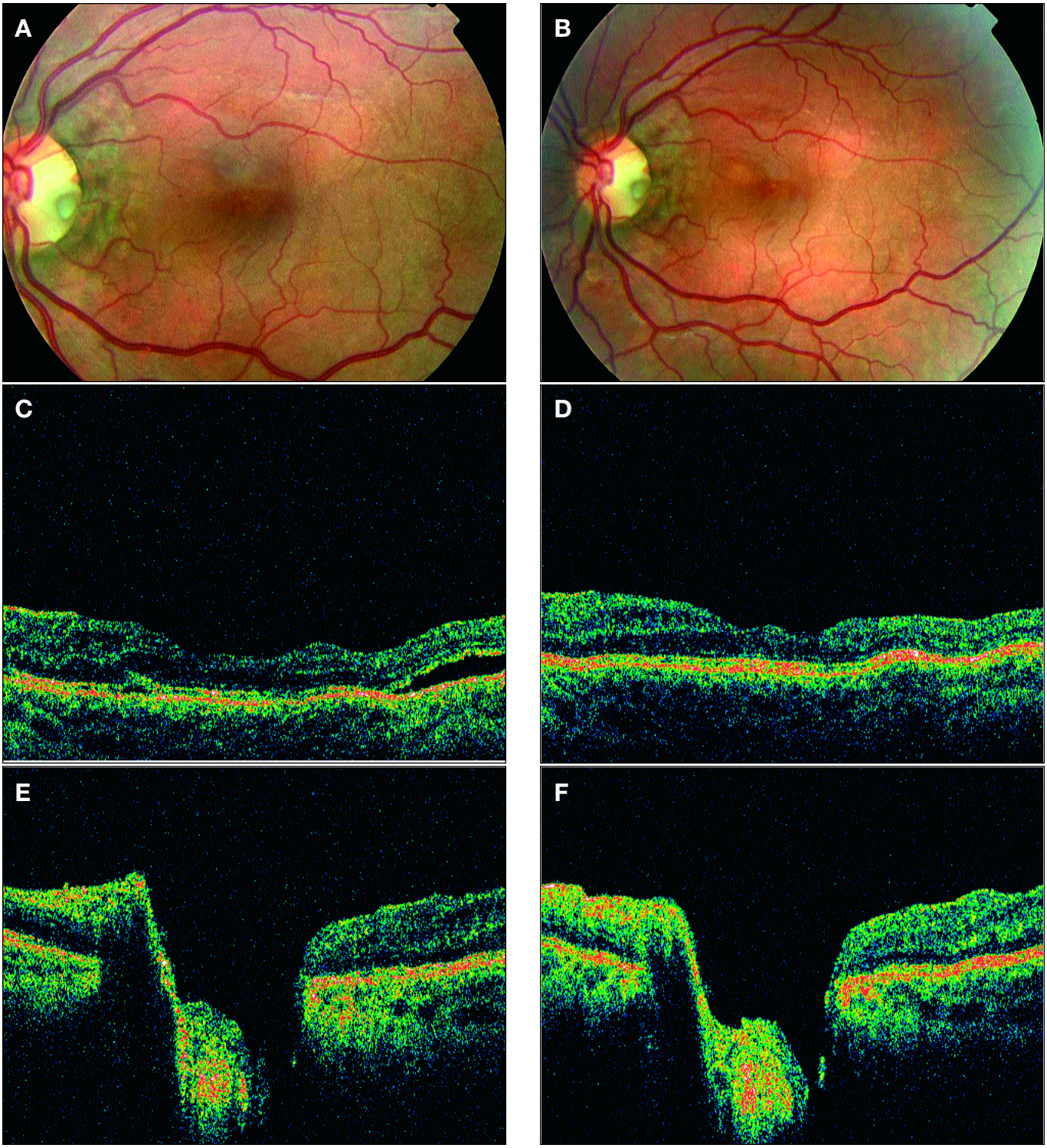

Fig. 2 - (A, B) *Fundus photographs 9 months after the first surgery and after 1 year of follow-up, showed the disappearance of the apparent lamellar macular hole, the complete flattering of the retina and corioretinal scars of laser photocoagulation temporal to the optic disk. Optical coherence tomography scan through macula and optic disk confirms the resolution of the macular and peripapillary schisis, after 9 months* **(C, E)** *and 1 year of follow-up* **(D, F)**, *respectively.*

After a year, the anatomic and functional results obtained with this approach are very good and have remarkably improved the quality of life of our patient.

In conclusion, the described procedure should be considered for the surgical management of serous macular detachment secondary to congenital optic disk pit.

The authors have no proprietary interest in any aspect of this study.

Reprint requests to:
Alessandro Vasco, MD
L. Pierantoni Hospital
Department of Ophthalmology
via Forlanini 34
47100 Forlì (FC), Italy
oculist@ausl.fo.it

REFERENCES

1. Theodossiadis GP, Koutsandrea C, Theodossiadis PG. Optic nerve pit with serous macular detachment resulting in rhegmatogenous retinal detachment. Br J Ophthalmol 1993; 77: 385-6.
2. Gass JD. Serous detachment of the macula secondary to congenital pits of the optic nerve head. Am J Ophthalmol 1969; 67: 821-41.
3. Akiba J, Kakehashi A, Hikichi T, Trempe CL. Vitreous findings in cases of optic nerve pits and serous macular detachment. Am J Ophthalmol 1993; 116: 38-41.
4. Cox MS, Witherspoon CD, Morris RE, Flynn HW. Evolving techniques in the treatment of macular detachment caused by optic nerve pits. Ophthalmology 1988; 95: 889-96.
5. Gandorfer A, Kampik A. Role of vitreoretinal interface in the pathogenesis and therapy of macular disease associated with optic pits. Ophthalmologe 2000; 97: 276-9.
6. Theodossiadis GP. Treatment of maculopathy associated with optic disk pit by sponge explant. Am J Ophthalmol 1996; 121: 630-7.
7. Goldbaum MH, McCuen BW, Hanneken AM, Burgess SK, Chen HH. Silicone oil tamponade to seal macular holes without position restrictions. Ophthalmology 1998; 105: 2147-8.