

SHORT COMMUNICATION

Combined surgical ablation and intravitreal triamcinolone acetonide for retinal angiomatous proliferation

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PURPOSE. Neovascular age-related macular degeneration (ARMD) with retinal angiomatous proliferation (RAP) has a poor natural history and the efficacy of any treatment has not yet been established. The authors describe a combined surgical treatment.

METHODS. A 76-year-old woman presented with a best-corrected visual acuity (BCVA) of 20/600 in the right eye and macula with stage 3 RAP as identified by fluorescein angiography (FA), indocyanine green angiography (ICGA), and optical coherence tomography (OCT). After a standard three-port pars plana core vitrectomy (PPV), endodiathermy of the arteriolar and venous feeder vessels of each lesion was performed, intraretinal RAP feeder vessels were cut with manual vertical intraocular scissors, and 0.1 mL of triamcinolone acetonide (TAAC) was injected intravitreally. At 1 and 4 weeks and at the sixth month, the patient underwent a complete eye examination, FA, ICGA, and OCT to assess outcomes and complications.

RESULTS. Six months later, BCVA was stable at 20/300, intraocular pressure was 15 mmHg, anterior segment and vitreous cavity were clear without evidence of TAAC granules, and retina was attached. FA and ICGA showed a complete occlusion of the RAP and absence of leakage or ischemia and OCT demonstrated decreased macular thickness with resolution of both intraretinal edema and pigment epithelium detachment, and the restoration of the normal macular profile. At the end of follow-up, the authors did not observe any ocular or systemic complication.

CONCLUSIONS. Surgical approach to RAP stage 3 with intravitreal injection of 4 mg of TAAC was safe and anatomically effective. (Eur J Ophthalmol 2005; 15: 513-6)

KEY WORDS. Choroidal neovascularization, Retinal angiomatous proliferations, Triamcinolone acetonide

Accepted: February 21, 2005

INTRODUCTION

Retinal angiomatous proliferation (RAP) is a distinct subset of age-related macular degeneration (ARMD) in which the vasogenic process originates from retinal capillaries (1). It may represent about 10 to 15% of newly diagnosed cases of neovascular ARMD (2, 3). A three-stage classification was proposed (1). Stage 1 is characterized by intraretinal

vascular proliferation; stage 2 shows a progression of the vasogenic process into the subretinal space inducing a localized serous pigment epithelium detachment (PED). In stage 3, there is manifestation of choroidal neovascularization (CNV) with retinal-choroidal anastomosis.

ARMD with RAP has a poor natural history (2), and the efficacy of any treatment has not yet been established. Recently, a small series of patients with ARMD and RAP

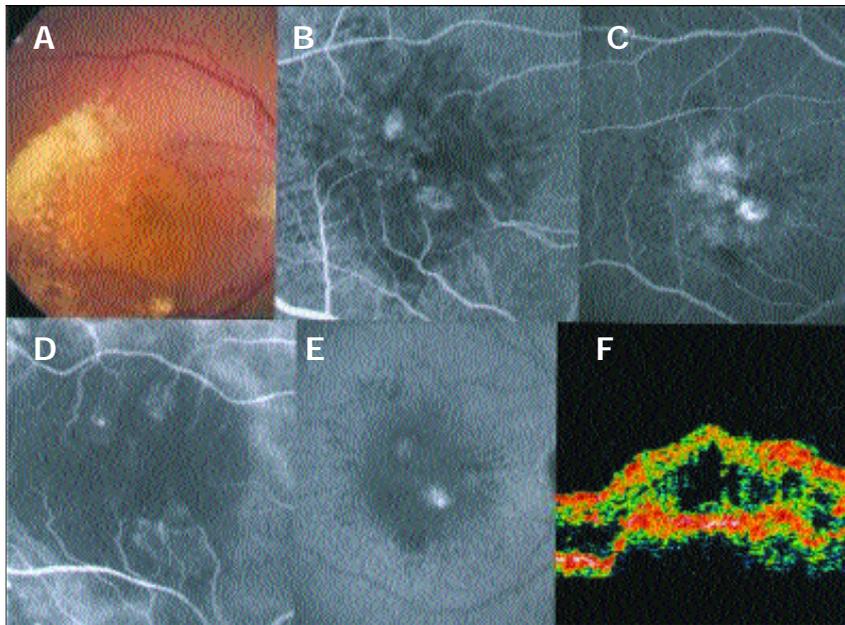


Fig. 1 - (A) Preoperative red-free photograph showed two small intraretinal hemorrhages at the site of a localized macular detachment circumscribed by a large area of exudation. **(B)** The early phase fluorescein angiogram (FA) revealed two foci of well-delineated hyperfluorescence of the intra- and subretinal angiomatous proliferation with retinal-retinal anastomosis, and radiating choroidal folds. **(C)** The late stage FA shows an increase in the intensity of the hyperfluorescence in the area of the RAP as well as intra- and subretinal leakage. **(D)** The indocyanine green (ICG) angiography detected three well-defined hyperfluorescent areas with retinal feeder arterioles and draining venules, on the background of a hypofluorescent area corresponding to the serous pigment epithelial detachment (PED). **(E)** The late ICG showed leakage from the angiomatous lesions in the late phases. **(F)** Preoperative optical coherence tomograph of the macular area showed an increased macular thickness, with intraretinal cystoid edema, overlying an elevation of the retinal pigment epithelium layer with marked photorefectance in the subpigment epithelial space, consistent with a fibrovascular PED.

stage 2 undergoing surgical ablation was described, with good outcomes (4). The rationale of this technique is provided by the interruption of the filling sequence assured by the retinal vessels to the angiomatous proliferation or the CNV (5). We describe a patient with ARMD and RAP stage 3 undergoing surgical ablation of the angiomatous lesions combined with intravitreal injection of triamcinolone acetonide (TAAC).

Case report

A 76-year-old diabetic woman presented to the Department of Ophthalmology and Otolaryngology, University of Bari, Italy. Her best-corrected visual acuity (BCVA) was 20/600 in the right eye and 20/40 in the left eye. Intraocular pressure (IOP) was 16 mmHg in both eyes. In the right eye optic media were clear. No sign of diabetic retinopathy was found. The right macula had a localized neurosensory retinal detachment with two small intraretinal hemorrhages, and was circumscribed temporally by a large area of lipid exudation.

Fluorescein angiography (FA) of the right macula revealed a subfoveal irregular leakage with cystoid pooling in the late phases, and choroidal folds, corresponding to occult CNV larger than 4.5 disk areas. Indocyanine green angiography (ICGA) detected three subretinal well-defined hyperfluorescent areas with clearly detectable retinal feeder vessels, which showed leakage in the late

phases. Optical coherence tomography scanning (OCT) showed an increased macular thickness with cystoid macular edema and PED with marked photorefectance below the level of the retinal pigment epithelium (RPE), suggestive of CNV (Fig. 1).

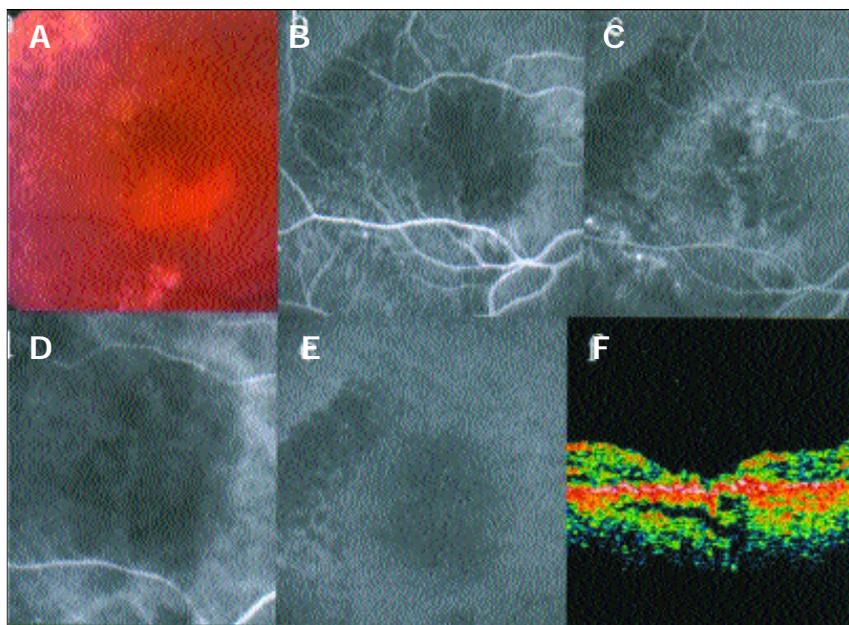
Given the low BCVA and the large size of the lesion (6), the patient was advised to undergo surgical ablation of RAP, and signed an informed consent.

Local anesthesia was obtained using 5 mL of sub-Tenon block (mixture 50:50 of lidocaine 2%–bupivacaine chloridrate 0.5%). Normal blood pressure was maintained at low levels to avoid excessive bleeding.

The procedure was performed under wide-angle viewing conditions (BIOM 3 m, OCULUS, Wetzlar; Germany) with fundus macula lens. After a standard three-port pars plana vitrectomy (PPV), surgical separation of the posterior hyaloid from the optic disk and posterior retina was performed. RAP lesions and their feeder vessels were identified finding the correspondence with the frames from ICG angiography.

The endodiathermy of the arteriolar and venous feeder vessels of each lesion was carried out about 1 disc diameter far from the fovea to avoid significant ischemia. After complete coagulation of the vessels, operating under elevated IOP to avoid possible bleeding, the intraretinal RAP feeder vessels were cut with manual vertical scissors. After a fluid/air exchange, 0.1 mL of commercially available TAAC was injected intravitreally.

Fig. 2 - (A) Six months postoperative clinical photograph demonstrated resolution of the macular detachment and reduction of the lipid exudation. **(B)** Fluorescein angiogram (FA) revealed the absence of early hyperfluorescence, retinal ischemia, and resolution of choroidal folds. **(C)** The late stage FA showed an irregular hyperfluorescence due to degeneration of the retinal pigment epithelium and absence of foveal leakage. **(D, E)** Indocyanine green angiography showed complete occlusion of the retinal angiomatous proliferations and the feeder vessels, and absence of late leakage. **(F)** The corresponding optical coherence tomograph demonstrated the decreased macular thickness with resolution of both intraretinal edema and pigment epithelial detachment, restoration of the normal macular profile, and marked atrophy of the neuroretina.



RESULTS

Six months postoperatively, we did not observe any ocular or systemic complication. Six months later (Fig. 2), BCVA was stable at 20/300, IOP was 15 mmHg, anterior segment and vitreous cavity were clear without evident granules of TAAC, and retina was attached. FA and ICGA showed a complete occlusion of the RAP, absence of leakage or ischemia, and resolution of the choroidal folds. The OCT demonstrated decreased macular thickness with resolution of both intraretinal edema and PED, and restoration of the normal macular profile. In the foveal area a marked thinning of the neuroretina was observed, corresponding to atrophy, explaining the poor visual result.

DISCUSSION

Neovascular ARMD with RAP has a poor natural history and the efficacy of any treatment modality has not yet been established. In stage 1, extrafoveal retinal vessels are treatable with thermal laser with good results. In stage 2, ICG-guided thermal laser photocoagulation has a low success rate, ranging between 10 and 25% (2, 3, 7). Moreover, in subfoveal CNV, laser treatment may induce damage to the overlying neurosensory retina leading to impairment of central visual function. Transpupillary ther-

motherapy (TTT) has been reported to be unsuccessful, inducing a rapidly progressive scar (8). Response to photodynamic therapy (PDT) in patients with RAP is not established yet, but seems unsatisfactory, due to the high percentage of reperfusion.

A small case series of surgical ablation of RAP stage 2 has been reported with good outcome (4). Advantages of this form of treatment are the sparing of the RPE and a more permanent closure of the feeder vessels.

In our single case of combined surgical ablation and intravitreal TAAC of RAP stage 3, we observed the complete closure of the lesions at 6 months with a flattening of the macula permitting the stabilization of BCVA. Diathermy alone might not be sufficient to permanently close retinal vessels. For this reason we preferred to cut the diathermized feeder vessels.

Intravitreal TAAC may be a reasonable adjunct associated with surgical treatment of ARMD with RAP. TAAC has a high anti-inflammatory and anti-edematous effect reducing vascular leakage; it also has antiangiogenic effect inhibiting retinal and subretinal neovascularization (9). Combination therapy of PDT using verteporfin along with TAAC has recently been proposed for CNV secondary to ARMD, offering the possibility of a reduced number of repeat treatments and improvement in visual acuity as compared with PDT alone (10).

Surgical approach to RAP stage 3 was relatively safe and anatomically effective even if it was not possible to

determine how much of the outcome was due to surgical ablation or to intravitreal TAAC. This surgical management is an option for patients with large lesions and severe visual loss, and might have the ability to induce a more permanent closure of feeder vessels than other techniques. Controlled trials are required to determine safety, efficacy, and timing of surgical ablation of RAP with or without intravitreal TAAC injection.

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