Treatment of choroidal neovascularization secondary to high myopia TEST

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Introduction

In high myopia, new blood vessels are the leading cause of visual loss, complicating patient outcomes in about 5-10% of cases. Myopia is the primary etiology of new blood vessel formation in subjects under the age of 50. The spontaneous growth of new blood vessels is highly unfavorable, leading to Fuchs spot formation.

Literature review

Previous treatments of myopic choroidal neovascularization include laser photocoagulation for extrafoveolar and juxtafoveolar forms, this was supplanted in the 2000s by photodynamic therapy (PDT), initially validated in subfoveolar forms [1], but whose indications have rapidly been extended.

Various studies have compared PDT to anti-VEGFs. All these studies show similar results supporting the superiority of anti-VEGFs for PDT. More recently, the multicentre studies REPAIR [2] and RADIANCE [3] have confirmed this clear superiority.

RADIANCE is a multicentre, randomized, prospective, active-controlled study assessing the efficacy and safety of two treatment regimens with 0.5 mg of ranibizumab versus PDT, in patients with visual loss secondary to myopic new vessel formation. In this study, 330 patients were included and randomized into three groups: a PDT group (n=55) and two Ranibizumab 0.5 mg groups treated according to functional criteria (Best-Corrected Visual Acuity stable on two consecutive examinations during follow-up: visual acuity (VA) stabilization group, n=106) or according to anatomical criteria (presence of subretinal fluid on OCT and/or fluorescein angiography: anatomical stabilization group, n=116). At 3 months, the mean VA gain was 2.2 letters in the PDT group compared with 10.5 and 10.6 letters in the 2 ranibizumab groups, respectively. It should be noted that in the group initially treated with PDT, VA improved after switching to ranibizumab. However the mean VA did not reach that of the groups initially treated with ranibizumab at 12 months (+8 vs. +13 letters).

In 2010, a study retrospectively analyzed 128 patients treated with anti-VEGFs alone (63 eyes), PDT alone (51 eyes) or a PDT-anti-VEGF combination (28 eyes). The best results were obtained when anti-VEGFs were used as a stand-alone therapy [4].

Therefore, results from the literature do not support the use of combined therapy, and furthermore, PDT may even be seen as disadvantageous.

Discussion and Arguments

1. Anti-VEGFs are the first-line treatment of new blood vessels threatening the foveloa or subfoveolar.

The accumulation of non-randomized studies with concurring results alongside the results of the randomized RADIANCE study, has led to a change in current treatment standards in force in France. Ranibizumab has successively been granted a European marketing authorization (MA) for the treatment of choroidal new vessels in high myopia, and cover from the social security scheme. For new blood vessels located more than 1000 microns from the foveola, photocoagulation, PDT or anti-VEGFs (off-label use) should be discussed on a case-by-case basis, taking into consideration their advantages and disadvantages.

2. Injection protocol

In high myopia, studies suggest the administration a single intravitreal injection followed by treatment on a pro renata basis (PRN), based on the signs of disease activity. However, when faced with highly exsudative and/or large new blood vessels, an induction phase consisting of 3 intravitreal injections followed by a PRN protocol, could offer a reasonable alternative [5]. This situation is more common in subjects over 50.

3. Additional examinations

<u>Examinations necessary for diagnosis</u>

The diagnosis of new blood vessel formation complicating high myopia may be suggested in consultations where there has been a decrease in VA and recent metamorphopsia.

There are several desirable examinations: measurement of VA (at best on a standardized scale such as the ETDRS, which will allow a more accurate monitoring) and all additional examinations to unequivocally confirm the diagnosis, as appropriate: OCT, color or monochromatic retinography, fluorescein and/or indocyanine green angiography.

<u>Examinations necessary for retreatment decisions</u>

Each follow-up visit includes, as a minimum, questioning on the development of functional signs, measurement of VA (at best on a standardized scale), a fundus examination (or retinography) and OCT.

There are several outcomes which may present themselves:

- The VA has improved, the patient no longer has metamorphopsia, the OCT centered on the initial lesions appears normal. In this context, fluorescein angiography is optional. There is no indication for retreatment, but monitoring should continue.

- The VA has not or has only slightly improved (less than 1 line) or the patient still has metamorphopsia, the OCT centered on the initial lesions shows exsudative signs (spaces, serous

retinal detachment). In this context, angiography is optional. There is an indication for retreatment.

- The VA has not or has only slightly improved (1 line or less) or the patient still has metamorphopsia, the OCT centered on the initial lesions shows no exsudative signs. In this context, fluorescein angiography is helpful as it may show a persistent dye diffusion and then lead to retreatment.

4. Frequency of monitoring

Monthly monitoring during the first 3 months, then a watchful and progressive interval in the absence of the recurrence of neovascular activity would be an optimal monitoring scheme. The patient should always be informed of the need to urgently seek a consultation in case of recent visual loss or new metamorphopsia.

Conclusion

New blood vessel formation in high myopia should be managed rapidly. Diagnosis is not always easy and, as appropriate, OCT, fluorescein angiography and indocyanine green angiography may allow confirmation of the diagnosis.

Anti-VEGF therapy is the first-line treatment of the disease. The usual protocol for anti-VEGF therapy is PRN treatment from the first intravitreal injection. However, an alternate protocol including an induction phase of 3 monthly injections may be proposed in case of highly exsudative and/or large myopic new blood vessels.

Retreatment decisions are based on the development of functional signs and anatomical findings, which are mainly provided by OCT and retinography. However, they sometimes require the use of fluorescein angiography, in particular in case of discrepancy between functional signs and OCT findings.

References

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