

Comparison between virtual PRL (Preferential Retinal Location) and PRF (Preferential Reading Field): rehabilitative prognosis

Clinical experience of the Low Vision Research Centre of Milan



Poster A260



FOR SIGHT :
THE FUTURE OF EYE AND VISION RESEARCH

Arvo 2010 – Fort Lauderdale – USA

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Purposes

The PRF (preferential reading field) is a retinal area on which the patient can project the image of a whole reading string: fixation is located on the median superior alignment of the reading string, between the third and the fourth letters. In the low vision patient the PRF is a residual area on which the patient can project at least four letters.

The PRL (Preferential retinal location) is a preferred area of almost 2° in which fixation is possible. In a normal patient the PRL and the PRF always coincide, while in the low vision patient these areas do not always coincide. (1-10)

Knowing the correct position and extension of the reading field is useful

	Centred PRF-PRL	Homogeneous PRF-PRL	Not homogeneous PRF-PRL
Reading Speed T0	61,50	39,64	56,47
Reading Speed Delta T1-T0	33,56	18,07	15,87
% Increase in speed	54,6%	45,6%	28,1%
Age	65,95	68,75	69,95
BCVA	0,21	0,15	0,21
Residual Pts	21	36,45	32,9
With System Pts	7,35	7,53	8,1
Reading Field	7,03	5,63	5,67
PRF ^o	0,21	4,59	4,01
PRF-PRL Delta	0,01	2,49	3,45

to better understand the rehabilitative prognosis.

From previous virtual evaluation we have understood that a reading field which is off-centre by more than 5° or with an amplitude of less than four letters, determines a decline in



Pict. 2: We estimate in the same patient the characteristics of the Preferential Reading Field (PRF). In right eye it can be placed to 1,8° superior. In left eye the PRF is superior of 4,5°, or on the left of 13,7°.

The choice falls on homogeneous PRL and PRF in the both eyes so as to become simpler the rehabilitative action.

The tests evidence the possibility to read with right eye and 3X, 7 pts, with left eye and 3X, 9 pts, with Reading Speed and Reading Coefficient of 45.

To the end of the visual rehabilitation both eyes read 6 pts in with +11 sf., (2, 75X) with Reading Speed and Reading Coefficient of 60.

We opted for a prismatic magnifying of 2X with which the patient improves also a distance of job.

rehabilitative prognosis.

The virtual vision analysis shows that PRL and PRF, that normally coincide, in low vision do not often coincide. So reading performance could vary, due to the respective position of both PRL and PRF. (11-15)

Patients and methods

We have studied 41 eyes of 31 low



Pict. 3: Patient female of 69 years old, with cataract, and wet ARMD. After a month from the treatment with anti VEGF repeated during the facemulsification, the BCVA is with right eye 0,1 and 48 pts with +3 sf. and with left eye 0,1 and 42 pts with +3 sf.

BCVA by far is better than BCVA by near, because the PRL is centered in both the eyes while the PRF is decentred. The necessary magnification is not very high but the important decentralization of the PRF and the low contrast oblige the patient to use of the CCTV.

The reading speed, initially of 50 words per min., at the end of the visual rehabilitation is only of 52 words per min. The degree of decentralization of the PRF is in relation to the rise of the reading speed during the visual rehabilitation.

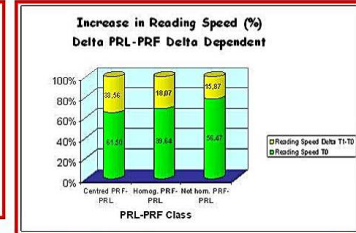
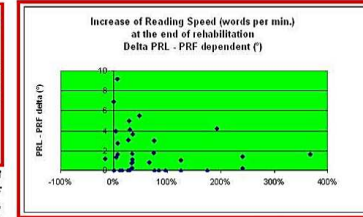
vision patients, aged between 25 and 93. Each patient underwent a microperimetric or a campimetric examination with Nidek MP1 or Octopus 123, then the results were analyzed with the low vision software for visual rehabilitation VirtualIPO.

For each patient we determined not only the functional parameters such as residual visual acuity for distance with Snellen Reading Chart or visual acuity for close-up in pts, residual and with a proper low vision aid, but also the respective position of PRL and PRF, their delta, the PRF amplitude in number of perceived letters and the increase of reading speed during rehabilitation.

Results

We divided the low vision patients into three groups, based on the respective position of PRL and PRF:

Group A: Centred PRL-PRF, in which

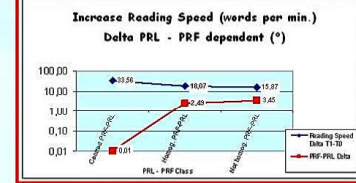


the PRL coincides with the PRF in the fovea. Group B: Homogeneous PRL-PRF, in which the PRL or the PRF are off-centre but in the same direction. Group C: Heterogeneous PRL-PRF, in which the PRL and the PRF are not only off-centre but also in different directions.

Median BCVA (BCVA: A: 0,21; B: 0,15; C: 0,21) and near visual acuity in pts with the magnifying aids (pts: A: 7,35; B: 7,53; C: 8,1) is similar in the three groups.

Reading speed depends on various items such as age, reading field amplitude, magnification, education or social class but we cannot find any variation due to mutual position of the PRL and the PRF (words/min. A: 61,50; B: 39,64; C: 56,47). The delta, instead, could vary (A: 0,01; B: 2,49; C: 3,45) and also the increase of reading speed after rehabilitation (word./min. A: 33,56 – 54,6%; B: 18,07 – 45,6%; C: 15,87 – 28,1%).

For a low vision patient who uses PRL to see their surroundings it is easier to improve his reading performance if his PRF coincides with his PRL, particularly if it is centred on the fovea,



but it is more difficult if PRL and PRF are on different areas and even worse if they are also heterogeneous.

Conclusions

We think that it is important to state in advance the virtual analysis of the visual field of the low vision patient before rehabilitation, not only to understand the virtual magnification and the best visual aid, but also to know all the essential knowledge about reading physiopathology, which could influence rehabilitation prognosis. Knowing the real position of PRL and PRF, if they are homogeneous or not allows us to plan the visual rehabilitation and the number of visual training sessions which are necessary for the stabilization of fixation in these determined areas.

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