Case Report: Vision Training For
National Hockey League Goaltender, Rogatien Vachon

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Abstract
This non-strabismic patient had an
insignificant refractive error, a small
esophoria, low fusional vergences,
no fixation disparity and symptoms
related to and interfering with his
goaltending. Compared to his right
eye, his left demonstrated slower
motor responses, unsteady fixation
and a tendency to overshoot with ver-
gence and reading tasks on
an Eye Trac instrument. A vision
training program was designed to en-
courage faster and more accurate
symmetrical and asymmetrical ver-
gence changes, version and tracking
eye movements, and accommodative
facility. After three months of daily
exercises, binocular coordination
and goaltending performance had
improved and symptoms were
relieved.

Abrégé
Ce patient ne souffre pas de stra-
bisme. Son examen révèle une réfra-
cion peu significative, une esophorie
minime, aucune disparité de fixation
mais des symptômes associés à son
travail de gardien des buts d'une
equipe de la Ligue National de
Hockey.

Une analyse photographique des
mouvements oculaires par "Eye
Trac" démontre une performance in-
férieure de l'œil gauche: réponse mo-
trice plus lente, fixation moins stable
et une tendance éosophorique sur les
versions et vergences et dans la
lecture.

Un programme de réhabilitation
luì a été préparé pour faciliter la rapi-
dité et efficacité des changements de
vergences tant symétriques qu'asymétriques; des mouvements
de versions et de poursuite, et de l'
accommodation.

Trois mois de pratiques quotidien-
nes ont amélioré la vision binoculaire
et améné la disparition des symptô-
mes et restauré sa performance de
gardien des buts.

Case History
Rogatien Vachon, a 34 year old
caucasian, was known as the highest
paid and the most successful go-
altender in the National Hockey
League. He had just completed a
rather indifferent series when he
presented himself for an oculovisual
assessment at the University of
Waterloo, School of Optometry. The
press said long shots were beating
him. He complained that his 'vision
blurred when concentrating inten-
sely and moving his eyes quickly
from place to place'. He felt 'dizzy
when the action of the game was
fast'. He had no history of spectacle
wear, diplopia or ocular surgery or
disease. His general health was
good. An ophthalmologist diagnos-
osed him as healthy three months
before. Twice in the past year puck
injuries to his left temple gave him
concussions. In response to his
symptoms, his physiotherapist gave
him many coordination exercises,
one of which was to watch his finger
moving towards his nose. Ken Dry-
den, also a goalie in the National
Hockey League, had advised him to
come to the University of Waterloo,
School of Optometry.

Ocular Examination
Examination revealed unaided vi-
sual acuities of 6/6+ for both eyes
with a subjective refraction of plano
O.U. His amplitude of accommoda-
tion was 7.75D O.D. and 7.50D O.S.
using Sheard's technique. Binocular
plus and minus acceptances were
+2.50 DS and -1.75 DS respec-
tively. Pupil reflexes responded bris-
kly. Internal and external
ophthalmoscopic examination re-
vealed no abnormality. A scar was
visible on the left temple. Intra-oci-
uar pressures were within normal
limits. Visual fields extended
beyond 120° and 150° along the 90
and 0-180 meridians.

Binocularly he had 4Δ esophoria
at 6m and .4m by Von Graefe tech-
nique. Fusional reserves using ro-
tary prisms were 10/5 Δ B.I. at 6m
and 12/18/12 3/4 B.I. at .4m. Suppres-
sion occurred with 24Δ B.O. at 6m
and with 21Δ B.O. at .4m. His gra-
dient ACA was 3 3/2/ID. He did not
report a fixation disparity on Mallet
or AOOC vectographic targets ei-
ther at 6m or .4m. His stereoscopic
threshold was 60 sec arc at 6m on the
AOOC vectographic slide, 40 sec
arc at .4m on Stereofly and Randot
tests and 63 sec arc on the Random
Dot E. Testing accommodative facil-
ity, Rogie was unable to clear a
-2.00 DS stimulus to accommodation.
Eye Trac traces revealed that the
left eye responded more slowly than
the right and overshot upon a
change in fixation. The left eye fix-
ated unsteadily (Fig.1).

Such small eye movement abnor-
malities, while not interfering with
ordinary visual tasks, did so with the
level of performance required for his
occupation. As goaltender he was
required to make fast and accurate
symmetrical and asymmetrical ver-
gence changes, respond quickly to
visual stimuli, coordinate vergence,
version and tracking eye movements
and change accommodation quickly
and accurately. He demonstrated
problems in all of these areas.

Vision Training Program
A vision training program was de-
signed to treat these specific binocu-
lar anomalies. The first two exer-
cises of four originated with the
author. The training exercises were
designed to stimulate as many of
the neurological systems required for

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Fig. 1

The figures show Eye Trac traces recorded before and after the vision training program. The before training traces (May) show the left eye had a delayed response when changing fixation in comparison to the right eye. The left eye also overshot markedly when changing fixation and demonstrated an inability to maintain steady fixation of the target. The after training traces (Sept.) show the left eye no longer responded more slowly than the right eye when changing fixation. The left eye maintained steady fixation and did not make overshoots when changing fixation.

The first exercise trained quick and accurate saccadic fixation. Forty-five 35mm slides were developed consisting of single Snellen letter E's, each oriented and positioned differently when projected. The sequence was randomly ordered and re-arranged daily. The patient stood on a balance board 30 ft in front and to the right of the projected area. Wearing his goalie mask and without moving his head, he fixated each letter E, noting aloud the orientation. Initially slides changed every 2 seconds. After some weeks, they were changed once a second. This procedure was repeated 30 ft in front and to the left of the projected area to train right versions. It was repeated with a variation. The patient inserted loose prisms bises out of magnitudes 5, 10 and 15° before each eye. The patient fixated each letter E, moving only his eyes and inserted prism base out, fused the images, and then withdrew the prism before the next letter appeared. This trained saccadic fixation and asymmetrical vergence. A second variation of this involved using -2.00DS lenses before both eyes. As each letter appeared he fixated it, inserted the lenses, focused the letter and then removed the lenses before the next letter appeared. By quickly altering the stimulus to accommodation, accommodative facility was trained (Fig.2).

The second exercise trained fixation. Letter E's mounted on plexiglass plates before two lamps provided the accommodative stimuli. Again the patient balanced on a board and wore his mask. One light was positioned 20 ft in front while another was 30 ft to the right or left of the patient. Independently, each lamp was illuminated intermittently by inserting a Rodale flasher between socket and bulb. Without moving his head, the patient fixated the letter illuminated at that moment. Right and left versions were
Results
The patient complied with the therapy, exercising two hours daily. His compliance was exceptionally good. Many patients, given home training over such a long period of time, would not have kept to the schedule. After three months of at-home training he was re-examined. Rogie felt his tennis and golf games, which he played in the off-season, had improved. He was able to see ‘better’ and more ‘clearly’ and was ‘more aware of his eyes’. His binocular findings were now 1Δ esophoria at 6m and 4m. His fusional reserves were x/12/103 B.I. and x/30/253 B.O. at 6m and x/24/163 B.I. and x/40/3 Δ B.O. at .4m. He did not experience either blur or breaking of fusion up to 403 B.O. which were the limits of the rotary prisms used for measurements. His gradient ACA ratio and binocular plus and minus acceptance remained unchanged. He still did not report a fixation disparity. Accommodative facility measured one second per cycle for both eyes. His stereoscopic threshold remained the same at 6m but improved to 20 sec arc on the Stereofly and Randot tests at .8m, and 53 sec arc on the Random Dot E test. Examination of Eye Trac traces showed both eyes now had similar reaction times. The left eye had steady fixation and no longer made overshoots (Fig.1).

Conclusions
Therapy was effective in producing a level of binocular coordination wherein both eyes performed more equally. Accommodative facility and fusional ranges improved. Suppression no longer occurred with introduction of base out prism. Even stereoscopic discrimination improved. The patient reported relief of symptoms and subsequently improved his goal tending performance.

References


7. Gregg, J.R. Take a look at your vision program, School Executive, 1957, 9, 76-78.