

Viewpoint ▶ Binasal Occlusion—Immediate, Sustainable Symptomatic Relief

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ABSTRACT

Very narrow binasal occlusion is a safe and minimally intrusive technique that can have immediate and dramatic effects for people with severe symptoms related to acquired brain injury or other neurological conditions. The mechanisms by which very narrow binasal occlusion effects such changes will be hypothesized but remain unknown at this time. Case reports of two adults with acquired brain injury and one with long-standing multiple sclerosis who experienced remarkable subjective improvement in symptoms including headache, nausea, disorientation, and balance issues are included.

Key words: acquired brain injury, binasal occlusion, cerebral palsy, multiple sclerosis

I have written previously about the use of binasal occlusion in an article that described an interaction early in my career.¹ I had no idea what to expect when I decided to try my binasal occlusion approach on an unsuspecting subject during an in-service presentation for occupational, physical, and speech therapists at a local hospital. Since that time I have used binasal occlusion in a wide variety of situations, and yet I probably don't explore its potential benefit with as many people as I should.

The subject of my previous article was Gina, a bright and delightful woman in her mid-thirties confined to a wheelchair by cerebral palsy. She was unable to sustain an upright head posture for any significant length of time or during the demonstration at the in-service. I had to ask her if she could straighten her head (which she was able to do fairly accurately) at least once per minute. Gina said that this was a constant issue for her and that people were always asking her to straighten her head. She never realized that her head was practically resting on her left shoulder unless someone brought it to her attention. This had been going on for most of her life. After placing her glasses back on her face, now with binasal occlusion, Gina's head instantly straightened and remained that way for the rest of the presentation and for another half hour or so while we had lunch. She immediately liked the binasal occlusion, and when I asked her why, she said, "I can tell where things are now." This certainly got my attention, and I have been a proponent of this technique ever since.

Binasal occlusion has been used for over 100 years (ancient Egyptian masks notwithstanding), starting with Louis Jacques who used it primarily for esotropes. The occlusion went from one nasal pupil border to the other to eliminate any benefit derived from one or both eyes turning toward the nose. The occlusion would eliminate the ability of the eye to see when it turned sufficiently (which wasn't very much at all) to end up behind the blockage. Thus the inwardly deviating eye(s) would be deprived of any benefit gained by turning in. This, it was hoped, would ultimately force the eye(s) to stop turning

in due to frustration. I imagine this must have worked in some cases though I have never attempted to use binasal occlusion in this manner. This strikes me as overly forceful. I am not, nor have I ever been, an esotrope, though I had some issues with esophoria when I was younger. Most of the literature on binasal occlusion continues to recommend occlusion from nasal pupil border to nasal pupil border, if not wider than this.^{2,3,4}

When I tried this technique on myself, I found it very disturbing. Even so, I did immediately notice a greater awareness, what struck me as a widening, or at least a heightened awareness, of my temporal peripheral fields. I consider this to be a desirable effect. I decided to try reducing the width of the occlusion until I no longer felt the annoyance of the occlusion but still could still appreciate the enhanced awareness of my peripheral fields.

I have always felt that this widening of the periphery was one of the factors behind the positive effects of binasal occlusion, perhaps analogous to the magnification inherent in low plus lenses, which may be a factor in their positive effects. I also think that obscuring a very small amount of the nasal field is beneficial, even though this may not enter conscious awareness. Removing this part of the field, where the integration of the two inputs is possibly the most challenging, may reduce the workload. This seems to be particularly true of a struggling visual system, in my experience.

Lastly, I have always felt the most important aspect of binasal occlusion is that it provides an anchor for the interface between the external environment and the internal visual process. Binasal occlusion places a marker in the environment, one that is consistent in size and in its placement in the field relative to both oculocentric and egocentric localization. The person needn't be consciously aware of the occlusion for this effect to manifest. Perhaps this is similar or related to the concept of using a fixation target to help stabilize balance.

I rarely use binasal occlusion wider than the space between the inner canthi (Figure 1). That is not to say that other



Figure 1: Typical application of binasal occlusion in my office.

approaches are inappropriate. It is important to adjust aspects such as width, angle, and wearing schedule size and location on a case-by-case basis, especially since this is completely non-invasive and easily modified. Nothing works all the time, but I have rarely had any negative feedback using the occlusion in this manner. I have in fact had a considerable number of immediately happier people.

I think that one of the underlying themes in what we do, especially in regards to lenses, prisms, and occlusion, is disruption. We sometimes need to disrupt the inefficient patterns of the past as we help people develop new patterns that are more broadly appropriate and have fewer undesirable side effects associated with them. I try to avoid the use of force in my lenses, occlusion, and vision therapy even when I find a need to implement this kind of disruption. I prefer to be more gently persuasive in guiding people to change their behavior patterns. Sometimes more is better, sometimes not. My preference with binasal occlusion is to have the person be totally unaware of the presence of the occlusion when looking straight ahead.

My intention is always to find the least intrusive external device that will enable the person to make the internal changes that best suit their needs and support their continued visual development. I have seen this minimalist binasal occlusion have immediate and dramatic effects with some people, and of course I have also seen it have no effect whatsoever. Sometimes the effects take more time to develop. The bottom line for me is to start small, give the person a reasonable period of time to respond, see what happens, and then make any necessary adjustments from there. Binasal occlusion is an extremely safe intervention technique.

As stated earlier the original binasal occlusion went from nasal pupil border to nasal pupil border. I rarely use binasal occlusion any wider than the distance between the inner canthi. Yes that's right - inner canthi. This may not seem a sufficient span to cause any change or provide any benefit, but time and time again, this small amount provokes a very desirable response. This is the same width I used with Gina and the same used in the three cases that follow. I have found that Scotch brand "Magic Tape" works just as well as black material, with added benefit of being less cosmetically imposing. This material is also useful as central occlusion because it is all but opaque to the wearer, but an outside observer can see what the eye behind it is doing with considerable ease. Some prefer

using stippled nail polish instead of tape--I prefer the tape which is easily removed, though the nail polish approach is useful for more long-term application.

Maia

Maia, a vibrant and engaging 64-year-old female, called in September 2011 after being referred by another patient. She was suffering with nystagmus and convergence insufficiency (her words) secondary to multiple sclerosis. I learned that her first symptoms appeared in 1972, when she suffered through six months of vertigo. This became an intermittent occurrence as did a dropped foot and balance problems. Multiple sclerosis was not diagnosed until 1999. She essentially stopped reading in the mid 1980s due to intermittent blur and an exacerbation of her vertigo, which accompanied reading. At her initial visit, Maia reported bouts of eye fatigue, double vision, discomfort at the computer, myriad reading issues, and motion sickness.

After greeting Maia in my waiting room and giving her an intake form, we spoke briefly. I asked Maia how she was feeling and she related that she was having a fairly normal day for her with her vertigo/headache weighing in at a four-out-of-ten. This had been her default setting for many years, with periodic exacerbations ranging from five to nine.

I asked to borrow Maia's glasses, returned to the training room, placed the binasal occlusion on her glasses, and returned them to her, asking her to wear them while I finished with my training patients. There was nothing particular about Maia that indicated beyond a doubt that this would do anything. Sometimes your intuition guides you to move in a certain direction. Intuition, informed by knowledge and experience, is a tremendous ally and should not be undervalued, in my opinion. However, I have had enough experiences with narrow binasal occlusion to realize that it is generally worth trying, especially when there are balance-related issues. My sense is that the anchoring effect can be helpful in stabilizing orientation. Even the narrowest of binasal occlusion provides a constant presence (albeit below the level of conscious awareness) in the interface between the outside world and our internal representation of it. I believe that this constant object in the field provides an anchor that functions in a manner similar to when we teach people to fixate consciously on a stable aspect of the environment in order to improve balance.

I returned to the waiting room little more than five minutes later just to check in, and to my surprise and delight, Maia reported that her vertigo had gone from a four to a one. I was not expecting this, and I suppose neither was she. She was absolutely thrilled. I decided it would still be a good idea to evaluate Maia anyway.

There was nothing particularly remarkable about the findings. The only signs of visual problems I detected were undershooting of saccades and slightly reduced stereo acuity at near, the testing of which made her "want to throw up." Maia



Figure 2: *Maia's home-made binasal occlusion: not quite as precise as I would like it.*

had two pairs of bifocals: one with a carrier for the computer and one with a carrier for distance. During the evaluation it was determined that Maia saw just as well at distance with her computer bifocals as she did with her distance bifocals. I applied binasal occlusion to her computer glasses, which improved the acuity even more, and suggested that she try wearing the computer glasses as much as possible. I followed up with Maia after two weeks and learned that she was no longer using her distance glasses at all and continued to be almost symptom free. Maia came in to start visual training one month after the initial encounter. She remained thrilled by the improvement. She started reading again and was very happy about it.

Due to her schedule, vision training was sporadic, and we only managed thirteen sessions between November 2011 and May 2012, though my hope was to complete a minimum of twenty-four sessions to achieve long-lasting improvement. It was also my hope that the binasal occlusion could be discontinued. Maia began reading again free of vertigo or focus changes soon after beginning therapy. During a three-month gap in therapy, she decided she was cured and took the binasal occlusion off her glasses. I learned this during a follow-up call to see when she would return. She questioned the need to return and told me she had removed the occlusion. I held my tongue and merely suggested that she at least return for a progress evaluation. She ended up cancelling that appointment the morning of, due to severe vertigo which had returned the night before. She said that she put the occlusion back on the glasses and felt somewhat better and came in the following week to resume vision therapy (Figure 2). I reapplied the occlusion the way I had originally intended and Maia said this felt even better than her attempt.

I followed up with Maia in September 2012, having not seen her since May. She reported that she was still happily reading five to six hours a day. She still has the binasal occlusion on her glasses. Unfortunately, she still needs this device to remain comfortable. It is always my hope that the binasal occlusion will be temporary and that vision therapy will eventually stimulate the necessary internal changes that will render the occlusion obsolete. Maia is very happy with the dramatic reduction in her symptoms and her recovered ability to read comfortably. I would prefer to continue the vision therapy, but you can't always get what you want. Maia last (January 2013) reported that she tried going without the occlusion but feels much better with it.

Bill

Bill, a 67-year-old male, is a long-time patient who was involved in a car accident eighteen months prior to the encounter at issue here. He reported that immediately upon exiting his vehicle he noticed that things far in the distance were double; this problem persisted, but only for anything further than a quarter of a mile away from him. Bill also reported that any sudden eye movement resulted in intense pain around his right eye. His exact words were, "like [my] eye was trying to unscrew itself from my head." These episodes caused Bill to wince in pain and stop whatever he was doing until the acute pain subsided back into the constant dull ache present since the accident. These episodes also caused Bill to lose his balance and feel like he was "not in his body" but next to where he knew himself to be. He was never diagnosed with a head injury, but I am convinced that such an injury did occur.

Initially, Bill's lawyer sent him to an ophthalmologist. The complaints of diplopia were brushed off as inaccurate. Bill's prescription (both distance and near, unchanged since 1994) was drastically changed by the ophthalmologist, who also added base out prism once he finally admitted apologetically, during their third encounter, that Bill actually did have intermittent diplopia. When the prism failed to provide any relief, the amount was simply increased. The prism continued to have no effect whatsoever and Bill went back to wearing an older pair of glasses with the (prism-free) prescription I had written for him years before.

One of the unusual aspects of this case was my having seen Bill several times over the years before his accident. Usually, when we see patients with acquired brain injuries, we have no knowledge of their visual status prior to the injury. Bill was not the most consistent patient; I first saw him in 1994, then again in 1999 and 2005. We successfully eliminated Bill's seasickness in 1999 with just a few months of VT.

The main differences in findings this time were decreased distance acuity, reduced stereo acuity at near, the presence of a vertical phoria at near, and increased magnitude of exophoria at near. My primary concern centered on Bill's complaints of losing balance and feeling like his eye was trying to unscrew itself from his head. This sounded rather unpleasant to me. I tend to consider using binasal occlusion when confronted with less common complaints, and Bill's description of his experiences since the accident certainly qualified. I applied my typical very narrow binasal occlusion to Bill's current (prism-free) glasses. He immediately made the kind of rapid eye movements that had been causing his acute symptoms. Nothing happened - no severe head pain and no sensation of dizziness. He stood up and tried again. No loss of balance and no sensation of being outside his body. Bill reported that it was almost one hundred percent better, immediately. We decided to pursue a vision therapy

program to maximize Bill's ability to handle his daily visual demands with less discomfort. This is still a work in progress.

Jayne

I first saw Jayne on August 11, 2010. She had suffered a traumatic brain injury on August 9, 2009 by hitting the top of her head and stunning herself. Jayne reviewed proposals for a living and complained of difficulty reading, light sensitivity, discomfort at the computer, fluctuating focus at all distances, and balance issues. She worked in a busy office, which regularly presented triggers that caused her severe discomfort. All busy environments seemed to trigger balance problems and disorientation. She did not want to show how much trouble she was having and just persevered at work as best she could. She was able to keep up the pace, but with constant discomfort.

We were unable to complete the initial evaluation because Jayne reported feeling dizzy and nauseated. She said she felt almost like vomiting and blacking out. Jayne said she started having a hard time fairly early on during the exam, but did not want to say anything too early or stop because it is her nature to push through hardship. Finally, she could not take anymore and had to stop. Luckily, there is a sofa in my waiting room; Jayne needed to lie down for the better part of an hour before she felt like she could walk to her car, let alone drive it.

Jayne's initial evaluation findings were relatively unremarkable, other than the history of acquired brain injury. Her compound myopic astigmatic compensating lenses provided almost 20/20 distance acuity. Her reading prescription provided what Jayne described as "not

comfortable anywhere" acuity at near, though the acuity was measured as 20/20 at near with her habitual near lenses. She exhibited alternating intermittent suppression at distance and near. Overall, the totality of findings did not paint as poor a visual picture as I might have expected given the severity of her discomfort. Nonetheless, based on her presenting complaints, I definitely felt it was imperative to attempt vision therapy.

Several weeks later, with unsurprising trepidation, Jayne made an appointment to begin a vision therapy program with me. She ended up cancelling that appointment, and that was the last I heard from her. That is, until she made an appointment for a progress evaluation on August 1, 2012.

Jayne reported that she continued to hide her discomfort at work, determined to push through; she was anything but comfortable. Jayne was being treated for what she thought was anxiety with some interesting techniques. These techniques seemed to recognize that the visual process is a big part of the problem for Jayne, and she had obtained some intermittent relief thanks to these techniques. Jayne had trouble in certain environments that, to my mind, provided triggers to provoke uncomfortable visual reactions, including nausea, loss of balance, and disorientation.

In comparing findings from 8-11-10 to 8-1-12, Jayne showed improvement in stereo acuity at near and improved base out ranges at distance and near. She continued to exhibit alternating intermittent suppression, but had a much easier time making it through the evaluation this time; she had no complaints of discomfort and managed to leave the office without having to lie down first.

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After the evaluation we decided that Jayne would begin a vision therapy program immediately in an effort to desensitize her to the visual triggers that were making her miserable. I decided to try one more thing before she left the office – binasal occlusion.

I placed my typically narrow strips of tape on her habitual lenses and Jayne immediately felt a difference. She was hesitant to admit what she was feeling for fear of it not being real. She said that she instantly felt 80% better. The following week, Jayne reported that she was maintaining the 80% improvement in her symptoms. She was much better able to handle busy public places, including her workplace. Jayne is currently doing vision therapy on an almost weekly basis. She continues to wear the binasal occlusion on her glasses and insists that she is not ready to discontinue that part of her treatment. The improvement she experienced immediately upon putting on the binasal occlusion continues unabated.

Conclusion

Nothing works for every person, and binasal occlusion is no exception. It even seems that techniques that one practitioner finds invaluable, another finds to be useless. You'll never know until you try though. I've had too many interesting experiences using narrow binasal occlusion with a wide variety of patients, including those with esotropia or exotropia. Sometimes it seems like the more complicated the situation and the more extreme the complaints, the more dramatic the response to narrow binasal occlusion--when it works. My hope is always that the binasal occlusion will be a temporary device, which will become unnecessary once the visual process has improved enough to

handle whatever life throws at it. However, if it turns out that the binasal occlusion needs to be continued longer than expected, I will still be satisfied that I was able to provide such a dramatic level of subjective improvement for these people. All I can say is you never know what might happen with any given individual who seeks your help, and if you don't try to step outside the box from time to time, you may never find out.

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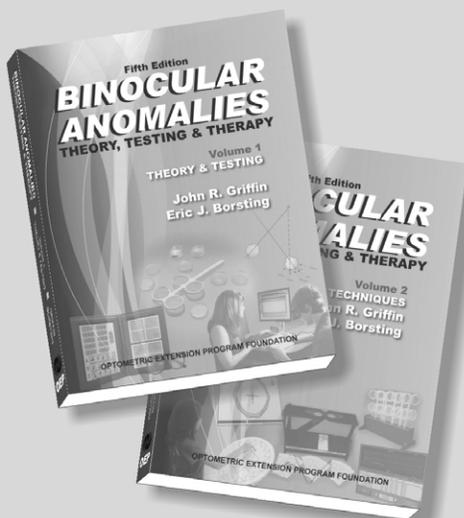
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