

PRACTICAL USE OF FRESNEL PRISMS

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The first time the Fresnel prisms were publicly introduced to Sydney was about twelve months ago by Miss Lance at a meeting to demonstrate this new clinical aid.

The possibilities of their use were interesting. Their light weight allows use of a high power. In the weeks which followed, patients who could apparently benefit from their use came to my attention and "therapy" was duly carried out.

The patients given the prisms, fall broadly into two categories.

1. Paralytic deviations.
2. Intermittent convergent squint.

1. Paralytic Deviations (three patients)

The reason for the use of the prisms was to give relief for two patients until surgery was performed and for one patient until recovery was complete.

Application and adjustment to use

The patients requiring surgery each had a vertical deviation, one of traumatic origin, the other the result of decompensation of a heterophoria, the cause of which was unknown. Both patients required correction of a refractive error, and permanent use of glasses. The detachable prisms for these patients gave use of binocular single vision pre-operatively and could be easily and readily removed following surgery. The prisms were split between both eyes for the patient with the decompensated deviation and, in the patient with the paralysed muscle, the prism was placed before one eye in a segment on the lower half of the lens.

Result

Pre-operative diplopia was eliminated by using the prisms in the two patients requiring surgery and one has since had surgery and is able to use single vision without the prism.

The third patient had a small deviation which occurred after a coronary occlusion and was showing signs of improvement. He complained of diplopia on laevo-depression which was intermittently troublesome when driving. By fitting a 7^Δ base down to the lower half of the right lens, single vision was achieved. As the symptom was intermittent, the prism was attached as required. Eventually the patient was able to discard the prism while retaining single binocular vision.

2. Intermittent Convergent Squint. (four patients)

Prisms were used for two patients for intermittent over-convergence for near, both with a negligible refractive error for which they refused their correction. Both patients clinically showed an ability to control the near deviation. One had a deviation too small for surgery and had given a negative response to using phospholine iodide. The second had an operable deviation but, because of a history of convulsions was thought unsuitable for surgery. He at times over-converged for distance fixation.

A third patient, at a test in 1970, showed an esophoric deviation. Twelve months later, a small convergent squint of 7 degrees was manifest.

The other patient had a convergent squint intermittently controlled and a myopic correction.

Application and adjustment to use

The prism selected was, in each case, less than the synoptophore prism measurement (between half to three quarters) and it allowed the use of binocular single vision clinically. The ability to bar read was used as a final check of the use of single binocular vision.

The patients who would not wear their refractive correction were given plano lenses for each eye with immediate acceptance. The child with the over convergence for distance and near was given the amount of prismatic correction required, split equally for distance; but with the additional strength required for near placed before the usually squinting eye. The patient who did not respond to the phospholine iodide was given the full prismatic correction before the squinting eye, because it had been tried, unsuccessfully, before the usually fixing eye.

The third patient, who after twelve months showed an intermittent squint for near, was given the appropriate prism to wear while he was overseas for six months. When tested last, before going overseas, he was using binocular single vision when wearing the prism but had developed a squint for distance fixation when without the prisms.

The last patient has been given the prism before the usually squinting eye and is responding to treatment, maintaining binocular single vision with weaker prisms.

All cases have resulted in the use of binocular single vision, but the condition of the patient with the bifocal deteriorated when the extra prismatic correction for near was eliminated.

Generally

Subjective acceptance has been good. There has been some initial awareness of chromatic aberration in the large strength prisms. The effect on the vision I have found to be negligible.

When gradually decreasing the strength of the prism, 5^A reductions were usually used until half the original strength was accepted, after which prism strength was decreased in smaller amounts. At this stage, it seems, prolonged usage of the one strength may be necessary, possibly for six months, before a reduction is tried.

In the treatment of intermittent deviations bar reading produced a more rapid decrease in the prismatic correction.

Fresnel prisms offer a new concept, in the treatment of many cases of heteropia and squint.