COMPARISON OF NEW VISUAL DISTURBANCES AFTER SUPERIOR VERSUS NASAL/TEMPORAL LASER PERIPHERAL IRIDOTOMY: A PROSPECTIVE RANDOMIZED TRIAL

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ABSTRACT SUMMARY
In this prospective randomized clinical trial, investigators assessed the impact of laser peripheral iridotomy (LPI) location on rates of self-reported dysphotopsia (eg, blurring, glare, and halos). The study enrolled phakic Indian patients who were 30 years of age or older and who carried a diagnosis of bilateral primary angle-closure suspect, primary angle closure, or primary angle-closure glaucoma. Patients with a history of LPI or iridoplasty, cataract or incisional glaucoma surgery, significant lens opacity, or an episode of acute angle closure were excluded. Participants were randomly assigned to receive either bilateral superior LPIs or bilateral nasal or temporal LPIs. Patients completed a questionnaire on dysphotopsias before and 2 weeks after undergoing same-day bilateral LPIs.

The rates of one or more self-reported dysphotopsias before the procedure in the superior LPI group (n = 285) and the nasal/temporal LPI group (n = 274) were similar (15.8% superior LPI group vs 13.9% nasal/temporal LPI group; P = .1). After LPI, the proportion of patients reporting one or more new dysphotopsias under binocular conditions was comparable between the two groups (8.4% superior LPI group vs 9.5% nasal/temporal LPI group; P = .7). Patients in the superior LPI group but not in the nasal/temporal LPI group reported halos and glare less often postoperatively than at baseline (P = .01 for each), perhaps due to resolution of pupillary block, steroid-mediated optimization of the ocular surface, and/or a placebo effect.

DISCUSSION
How was LPI performed? Did technical differences exist between the groups?
All patients were pretreated with 2% pilocarpine and received an Nd:YAG LPI in both eyes on the same day. Superior LPIs were placed between the 11:00 and 1:00 clock positions to ensure complete coverage by the eyelid. Nasal/temporal LPIs were placed between the 2:00 and 4:00 clock positions or the 8:00 and 10:00 clock positions, clear of the eyelid margin. Patients administered prednisolone acetate 1% drops for 10 days postoperatively. IOP elevations were managed at the discretion of the treating physician.

Interestingly, to achieve patency, superior LPIs required more laser shots (13.7 vs 10.8; P = .006) and more laser energy (59.1 mJ vs 45.1 mJ; P < .001) on average than did nasal/temporal LPIs. Despite these differences, the proportion of patients experiencing new dysphotopsias after LPI was comparable between groups using both univariate and multivariate analyses. Postoperative anterior chamber reaction, LPI size, and number of supplemental glaucoma medications were also similar between groups.
How did the results of this study compare to those from earlier studies? Dysphotopsias after LPI are thought to result from the prismatic effect of the tear meniscus at the eyelid margin, but previous studies examining the impact on postoperative visual disturbances of LPI location relative to the eyelid have provided inconsistent results. In a case series by Spaeth and associates, visual disturbances occurred in 8.9% of patients whose LPIs were completely covered by the upper eyelid, 26% of those whose LPIs were partially covered by the upper eyelid, and 17.5% of those whose LPIs were fully exposed. In a prospective randomized trial, Vera and colleagues observed a higher rate of new linear dysphotopsias among eyes with superior versus temporal LPIs despite complete eyelid coverage in a majority of the symptomatic eyes with superior LPIs. In contrast, Congdon and associates found no relationship between degree of eyelid coverage, size or location of the LPI, and rates of postoperative dysphotopsias in a prospective cohort study. Variations in eyelid position due to patient age and/or ethnicity might have accounted for some of the differences among earlier studies.

LASER PERIPHERAL IRIDOTOMY FOR THE PREVENTION OF ANGLE CLOSURE: A SINGLE-CENTRE RANDOMISED CONTROLLED TRIAL
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ABSTRACT SUMMARY
In this randomized controlled study, investigators evaluated the safety and efficacy of LPI for preventing the development of primary angle closure and/or an acute angle-closure crisis in 889 Chinese patients aged 50 to 70 years. Additional inclusion criteria were bilateral primary angle closure suspect (ie, ≥ 6 clock hours of appositional angle closure without peripheral anterior synechiae and IOP ≤ 21 mm Hg), a vertical cup-to-disc ratio of less than 0.7 with less than 0.2 cup-to-disc asymmetry, and normal or borderline glaucoma hemifield tests on automated perimetry. One eye of each participant was randomly selected to receive LPI, while the fellow eye remained untreated.

Over a follow-up period of up to 6 years, 19 eyes (2.1%) in the treated (LPI) group and 36 eyes (4.0%) in the untreated (no LPI) group reached a primary endpoint (ie, > 1 clock hour of peripheral anterior synechiae, IOP > 24 mm Hg, and/or acute angle-closure crisis; \( P = .0041 \) for pairwise analysis, \( P = .023 \) for Cox proportional hazard model with adjustment for age, sex, baseline IOP, and angle width). One eye (0.1%) in the treated group and five eyes (0.6%) in the untreated group developed acute angle-closure crisis (\( P = .1 \)). There were no serious intraoperative or immediate postoperative complications associated with LPI. Postoperative IOP elevations to 30 mm Hg or higher occurred in six eyes (0.7%) 1 hour after LPI, all of which returned to normal with medical therapy within 2 days. Visual acuity was comparable between groups at all visits.

DISCUSSION

How did the rates of angle closure in untreated eyes compare to those reported in earlier studies?

Several studies have provided data on the natural history of untreated primary angle-closure suspects. In a study of 129 untreated angle-closure suspects, 25 (19%) developed angle closure over a follow-up period of up to 6 years; angle closure was not acute in most (17 of 25) cases. In a community-based Chinese study, 20 of 485 (4.1%) primary angle-closure suspects had developed glaucoma at 6 years. The higher rates of progression to angle closure observed in earlier studies may be a result of bias introduced by clinic-based recruitment and nonstandard definitions of angle closure.

STUDY IN BRIEF

Results from this prospective randomized study of primary angle closure suspects in Guangzhou, China, suggested that laser peripheral iridotomy (LPI) confers a small but statistically significant reduction in the risk of progression to primary angle closure.

WHY IT MATTERS
LPIs are commonly performed on primary angle closure suspects, but, in this study, preventing a single case of primary angle closure required treating a large number of patients. Given the low rate of conversion to primary angle closure they observed, the investigators suggested that prophylactic LPI may not be indicated in all primary angle-closure suspects.

What are the implications of this study for current clinical practice?

Although prophylactic LPIs are widely performed on primary angle-closure suspects, evidence that the procedure prevents progression to primary angle closure and primary angle-closure glaucoma is minimal. He and colleagues reported a low overall rate (8 per 1,000 eye-years) of natural progression to primary angle closure in untreated primary angle-closure suspects in the LPI group compared to the untreated group.
The investigators estimated that 44 suspects would have to be treated to prevent one case of angle closure in 6 years, with no effect on vision. These researchers therefore recommended against prophylactic LPI for primary angle-closure suspects.

Despite the low event rate in this study, the 47% reduction in risk of progression among LPI-treated suspects was statistically significant ($P = .024$). The costs and risks associated with LPI therefore must be weighed against the potential likelihood of angle closure and related morbidity in each primary angle-closure suspect. Further research into biometric parameters (eg, iris thickness, lens vault) may help identify which patients are at higher risk of developing angle closure. Readers must also be cautious about generalizing the results of this study to other populations.


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