Omitting pilocarpine improves efficiency in Laser Peripheral Iridotomy

Riddhi Shenoy, Sanjana Rao, Tom Eke- riddhi.shenoy@nnuh.nhs.uk

Norfolk and Norwich University Hospitals NHS Foundation Trust

BACKGROUND

Many practitioners routinely instill pilocarpine 2% prior to Laser Peripheral Iridotomy (LPI), believing that a 'pilocarpine-LPI' makes the procedure easier, and/or the LPI better. However, the pilocarpine may also (transiently) open the angle, meaning that an open angle immediately after pilocarpine-LPI might be thanks to the pilocarpine, rather than the LPI itself. Omitting pilocarpine, with a 'no-pilocarpine-LPI', should mean that any opening of the angle should only be due to the LPI itself.

AIM: To measure the effectiveness, adverse event profile (and potential efficiencies) of LPI without pilocarpine pre-treatment: "if the angle has opened on the day of LPI, will it stay open?"

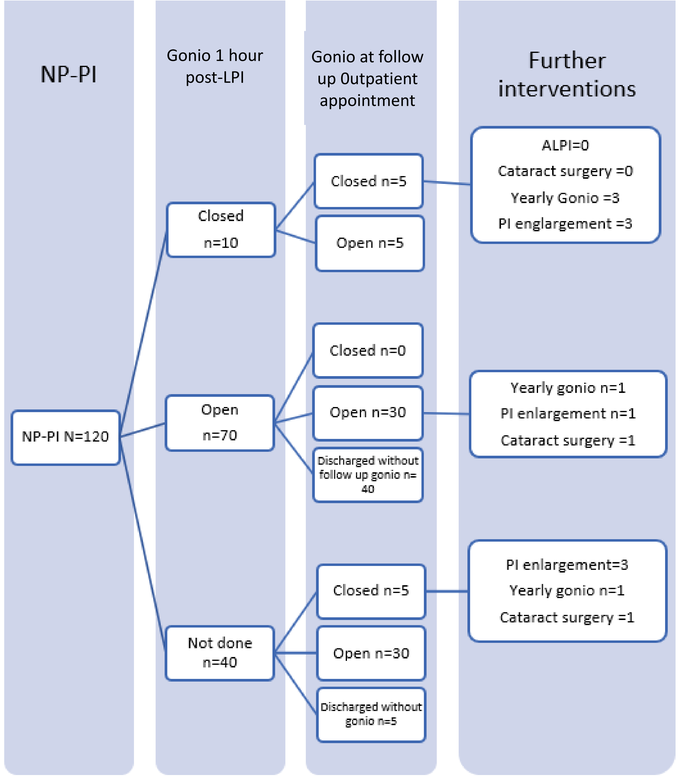


Figure 1: Patient flowchart, no-pilocarpine-LPIs

METHODOLOGY

With Clinical Audit Department approval, we retrospectively reviewed files for 243 LPIs. Cases were identified from the laser record book. Those LPI's that did not have pilocarpine pre-treatment were defined as "No-pilocarpine-LPIs (NP-PI)' – all had apraclonidine drops. Primary angle closure glaucoma or acute angle closure cases were excluded from this audit, as this would affect discharge and follow up data. Only patients who had follow up completed were included as this would mean they had post LPI gonioscopy. For bilateral LPIs, we selected one eye at random. Statistical analysis was carried out using Microsoft Excel.

We created a patient journey flowchart for both groups showing patient events at each clinic visit (figs 1 &2). This allowed us to show the visits at which angle assessment took place and outcomes and identify areas of efficiency.

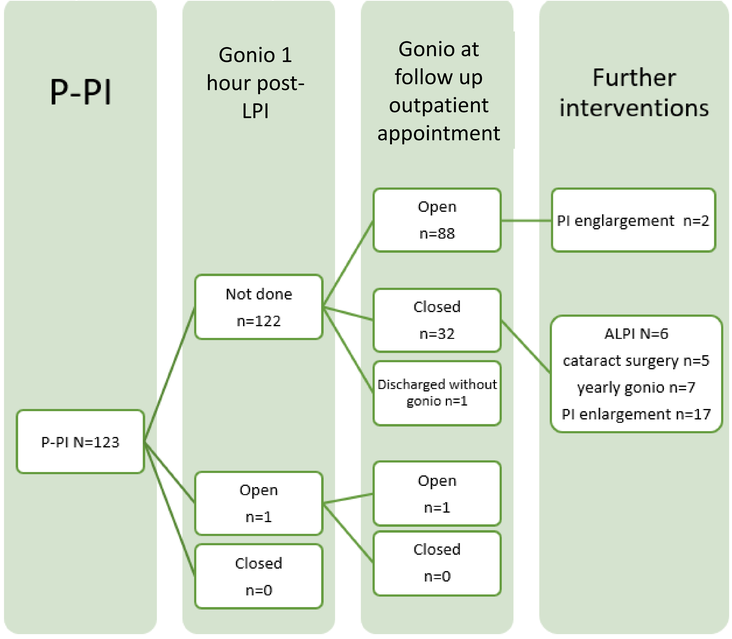


Figure 2: Patient flowchart, pilocarpine-LPIs

RESULTS

123 pilocarpine-LPIs (P-PI) and 120 no-pilocarpine-LPIs (NP-PI) were included (figs 1 & 2, table 1). The NP-PI group only had only one type of IOP-lowering drop (apraclonidine) prior to laser, whereas most of the P-PI group had 2 different drops (pilocarpine & apraclonidine). There were no serious adverse events or sight threatening complications in either group. However, two patients experienced vasovagal syncope: both had pilocarpine (hypotension and bradycardia are recognized side-effects). 40 **no-pilocarpine-LPIs had post-LPI gonioscopy both on the day and also at a follow-up visit: 30 were 'open' on the day; all 30 (100%) also had open angles at follow-up** (Fig 1). A further 10 NP-PI's still had 'narrow' angles on the day; five of these (50%) were 'open' at follow-up (Fig 1). There was no difference in the mean total energy used (70mJ each group). There were low rates of IOP spike 1 hour post LPI in both groups, as compared to literature. Overall effectiveness (percentage open angles at follow-up) was similar (possibly better in NP-PI), with gonioscopically open angles at follow-up in 86% (65/75) of the NP-PI's compared to 74% (89/122) of the P-PI's. Rates of post-PI glare were low, and similar in both groups. This was in the lower range quoted in the literature, with no patients with glare required tattooing in either group.

	Published rate	Pilocarpine-LPI	No-pilocarpine LPI
Significant IOP spike 1 hour post LPI	**6-9.8% [2]**	**2% (2/123)**	**2.5% (3/120)**
Significant IOP elevation at follow-up		**2% (3/123)**	**5% (6/120)**
Inadequate LPI requiring: PI enlargement	**1-20% [1]**	**15% (19/123)**	**6% (7/120)**
Rate of angle opening on gonioscopy, NP-PI v P-PI at OPA	**67-81% [1]**	**74% (89/122)**	**86% (65/75)**
Rate of glare/visual symptoms post LPI (NP-PI v P-PI)	**2-11% [1]**	**3% (3/123)**	**2% (2/120)**
Proportion of patients having unplanned returns to clinic before planned post-operative follow up appointment	**n/a**	**4%(5/123)**	**2.5%(3/120)**

Table 1: Standards comparing outcomes from published standards, pilocarpine-LPI and no-pilocarpine LPI results

CONCLUSIONS

LPI with and without pilocarpine had similar success rates, and low complication rates.

If pilocarpine is not used, then a post-laser gonioscopy (on the day, at the time of the post-LPI pressure check) will predict the long-term success of the LPI:

"If the angle has opened on the day, it will remain open at follow-up"

"If the angle has not opened on the day, there's a 50% chance it will have opened at follow-up "

Omitting pilocarpine and doing a post-laser gonioscopy on the day of LPI allows for more efficient clinics, with most patients suitable for nurse follow-up.

(No commercial relationships to declare)

REFERENCES

1. Radhakrishnan, Sunita, et al. "Laser peripheral iridotomy in primary angle closure: a report by the American Academy of Ophthalmology." Ophthalmology 125.7 (2018): 1110-1120. 2. Rozon JP, Des Marchais B. Recommendations for intraocular pressure measurement one hour after laser peripheral iridotomy: Review of the literature. Journal Français d'Ophtalmologie. 2021 Sep 24.