

The role of anterior segment optical coherence tomography in glaucoma virtual clinics: How can it be used to refine referrals for primary angle closure?

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Introduction

- High number of suspected narrow angle referrals referrals from optometrists
- Large number being referred for gonioscopy in face-to-face (F2F) clinic following remote review of anterior segment OCT (AS-OCT) images
- No guidelines on AS-OCT criteria for referral from virtual to F2F clinic for gonioscopy
- Results of ZAP and EAGLE studies are redefining pathways and interventions for patients with angle closure^{1,2}
- Audit aimed at correlating AS-OCT in virtual screening clinic with gonioscopy and outcome in consultant clinic in order to refine AS-OCT criteria for onward review and reduce unnecessary clinic appointments

Aims and Objectives

- Assess outcomes of those patients that were referred into the virtual screening clinic for narrow angles
- Assess how AS-OCT imaging can be used and criteria set to screen referrals for narrow angles and refine which patients require consultant input

Methods

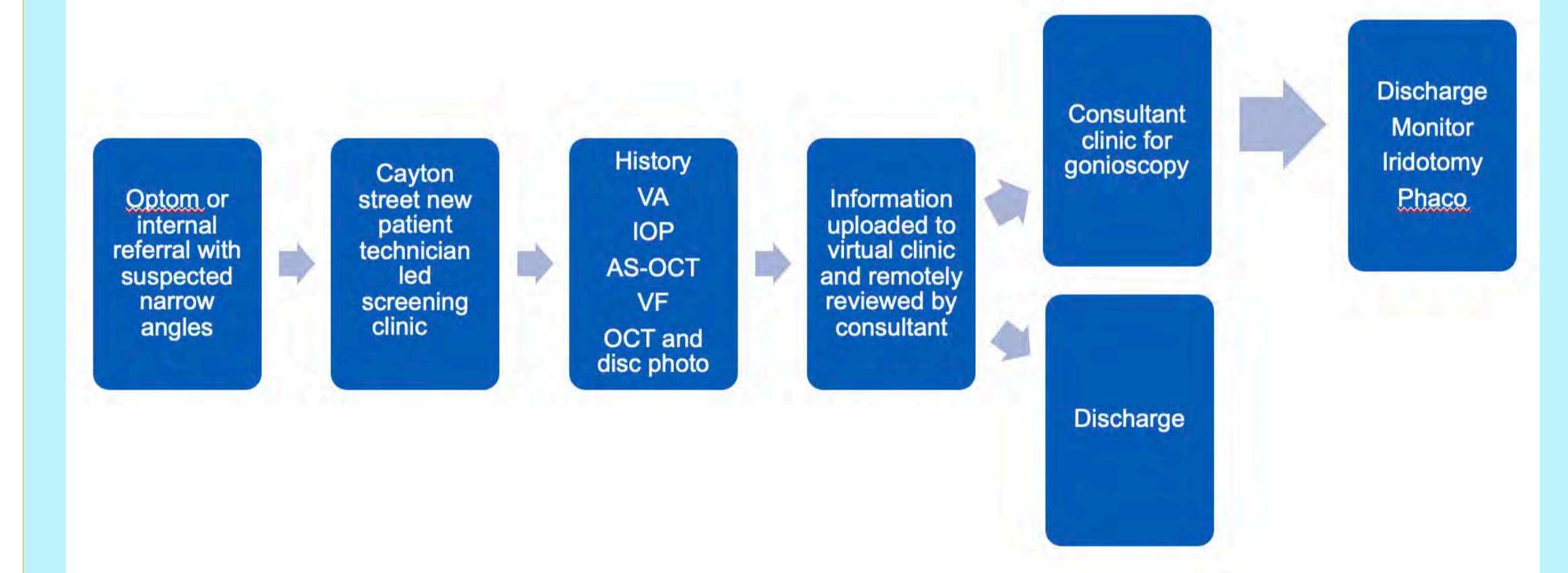


Figure 1. Current patient pathway for referrals for narrow angle

- Patients referred to the technician-led screening clinic for narrow angles, according to the pathway in Figure 1, from April 2019 to September 2019 were retrospectively identified
- AS-OCT images of nasal and temporal angles were analysed and the angle width in degrees measured, following identification of scleral spur (Figure 2)
- Outcome following consultant remote review was recorded from electronic patient record

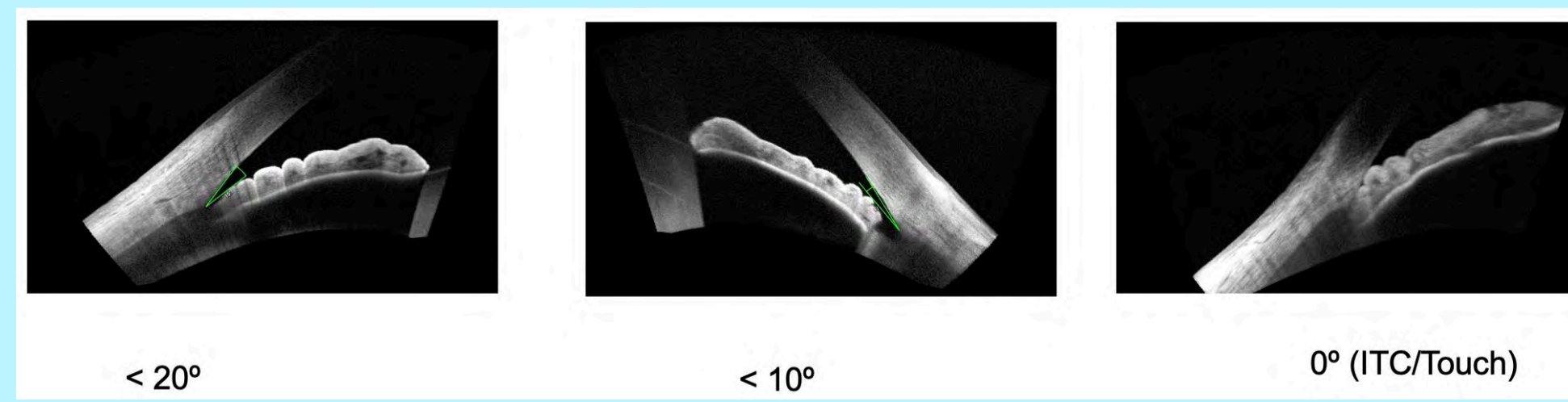


Figure 2. Examples of AS-OCT images at different anterior chamber angles

Results

Demographics	
Age, (years)	57.5 ± 13.0
Sex, (female:male)	98:39
Ethnicity, n(%)	
White	74 (54%)
Asian	19 (14%)
African-Caribbean	10 (7%)
Mixed	2 (2%)
Other	27 (19%)
Unknown	5 (4%)

Table 1. Demographic characteristics of patients referred to the screening clinic

- The main sources of referrals were GPs and opticians/optometrists (Figure 3)
- Alongside narrow angles, other indications for referral included raised intraocular pressure and cupping of the optic disc (Figure 4)

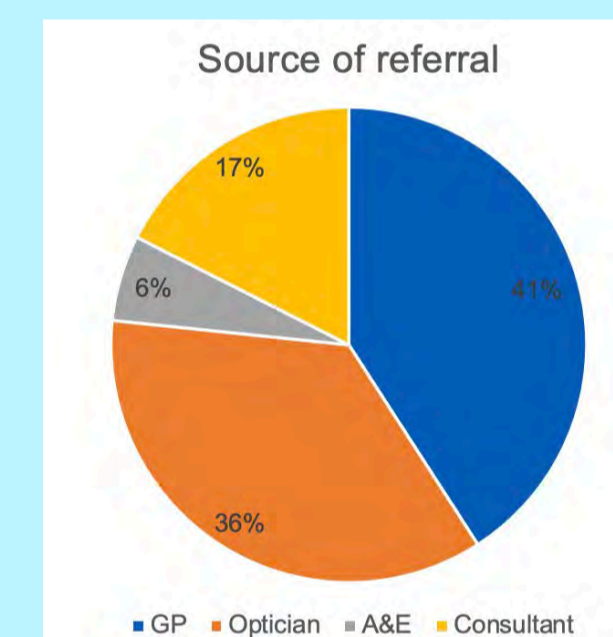


Figure 3. Sources of referrals to the virtual screening clinic for narrow angles

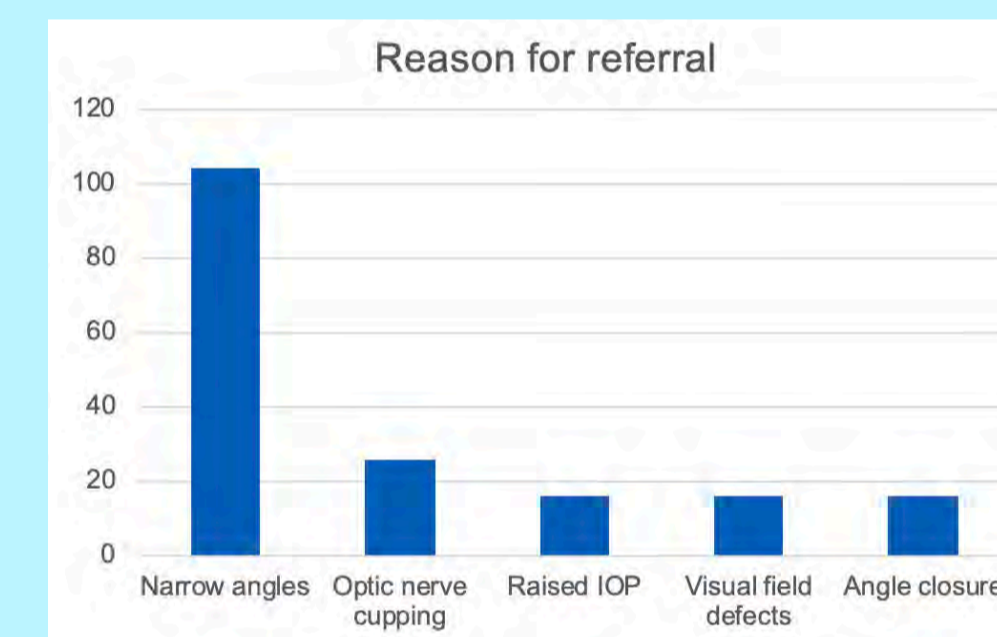


Figure 4. Numbers of the main reasons for referrals

- 137 patients had been referred to the virtual screening clinic over the 6-month period (Figure 5)
- Of these referrals, 34% were discharged following remote review of clinical data by a consultant and the remainder were referred into the consultant-led F2F clinic
- Once seen by a consultant, equal percentages of patients were discharged, monitored or offered treatment (Figure 6)

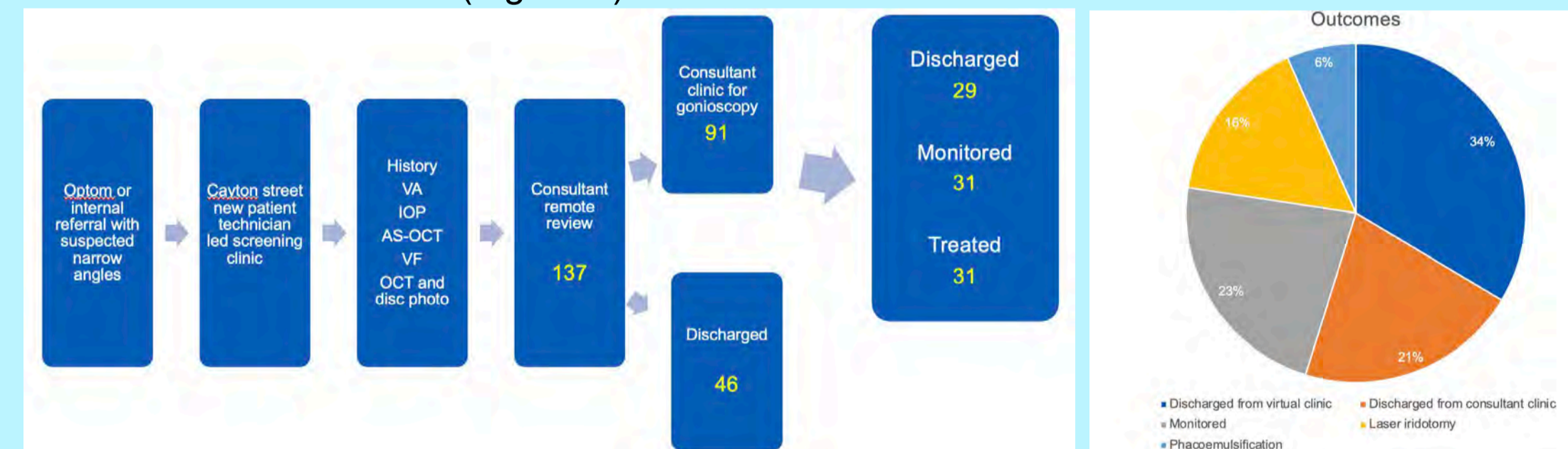


Figure 5. Outcome of referrals by stage

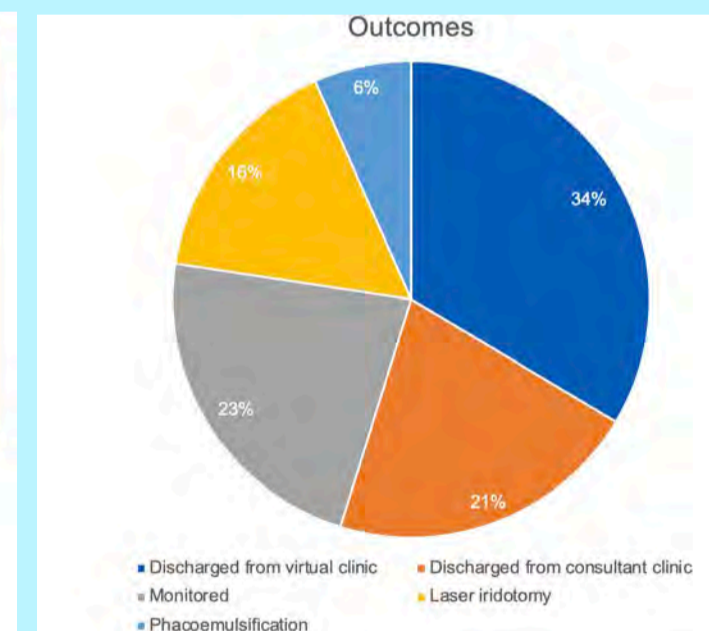


Figure 6. Outcome of all referrals

- Amongst these referrals for narrow angles, only 36 patients had iridotrabeular contact (ITC) in 1 or more quadrants as seen on AS-OCT
- Of those who had ITC in 1 or more quadrants, only 8% were discharged and 73% required intervention (Table 2)
- Of those without ITC on AS-OCT, 72% were discharged and only 5% required intervention
- All of the 5 patients that required intervention despite not having ITC on AS-OCT had additional risk factors for angle closure

Results (Continued)

	≥ 1quads ITC	No ITC
Total patients	36	101
Outcome		
Discharged from virtual clinic	0	46 (46%)
Discharged from consultant clinic	3 (8%)	26 (26%)
Monitored	7 (19%)	24 (24%)
Laser iridotomy	18 (50%)	4 (4%)
Phacoemulsification	8 (23%)	1 (1%)

Table 2. Correlation between AS-OCT findings and outcomes of referrals

Recommendations

The findings of the initial audit were presented at the Trust Clinical Governance Meeting. This led to a refinement of the referral criteria to the consultant clinic:

1. Patients would only be referred to the consultant F2F clinic if ITC was demonstrated on AS-OCT
2. Patients should still be referred to the consultant clinic if they had risk factors for angle closure (such as family history, medication and other ocular pathology) even if no ITC was seen on AS-OCT

Results from re-audit

Criteria	Initial Audit	Reaudit	↑ / ↓
Total number of patients referred	137	98	↓
Number of patients discharged from virtual clinic	46 (34%)	53 (54%)	↑ 20%
Number of patients referred to consultant clinic	91 (66%)	45 (46%)	↓ 20%
Outcome following consultant review			
Discharged	29 (32%)	11 (24%)	↓ 8%
Monitored	31 (34%)	19 (42%)	↑ 8%
Treated	31 (34%)	15 (34%)	=

Conclusions

- AS-OCT allows for the delivery of a virtual model of care as it allows for rapid image acquisition with minimal training
- The initial audit identified that a significant proportion of referrals to a screening clinic for narrow angles did not require consultant input
- ITC on AS-OCT is a useful predictor of which patients would benefit from consultant input
- Following refinement of criteria, the re-audit demonstrated an improvement in service efficiency as a higher percentage of patients being referred for consultant input actually required monitoring or treatment

References

¹ He M, Jiang Y, Huang S, Chang DS, Munoz B, Aung T, Foster PJ, Friedman DS. Laser peripheral iridotomy for the prevention of angle closure: a single-centre, randomised controlled trial. *Lancet*. 2019; 393 (1081): 1609-1618

² Azuara-Blanco A., Burr J., Ramsay C., et al. Effectiveness of early lens extraction for the treatment of primary angle-closure glaucoma (EAGLE): a randomised controlled trial. *The Lancet*. 2016;388(10052):1389-1397.