Intracranial stenosis in patients with retinal ischaemia

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Introduction

Retinal ischaemia can be caused by either emboli or small vessel disease affecting the retinal vasculature. Little is known about the role of intracranial stenosis in this context.

We aimed to determine:

- Rates of ipsilateral intracranial atherosclerotic stenosis (ICAS) in patients with retinal ischaemia causing transient and permanent visual loss (TVL and PVL respectively)
- Correlation of these data with:
  - ipsilateral carotid stenosis (CS) measured by Doppler ultrasound
  - number of vascular risk factors (No.RFs: hypertension, diabetes, atrial fibrillation, previous stroke, previous TIA, hypercholesterolaemia, smoking status)

Methods

Setting:

- Daily TIA clinic at University College London Hospital
- Majority of patients referred after ophthalmological examination at Moorfields Eye Hospital had excluded ischaemic optic neuropathies

Data collection:

- Retrospective review of 485 consecutive patients presenting with TVL and PVL from June 2013 – September 2018
- We rated ipsilateral ICAS using a previously published rating scale which we modified for CTA[1]

Table 1: ICAS grading system

Grade	Description
0	No atherosclerosis
1	Flecks calcium
2	Circumferential vessel wall calcium >25%
3	Stenosis <50%
4	Stenosis >50%
5	Occlusion

Fig. 1: example of left ICAS 4

Results

- 256 patients had CTAs, 251 were of diagnostic quality
- Mean age was 63.1 years
- 159 (62%) of patients were male, M:F ratio = 1.6:1

- Rates of ICAS are shown in figure 2. Of note, 12% of patients had visible intracranial stenosis (ICAS 3 or 4)

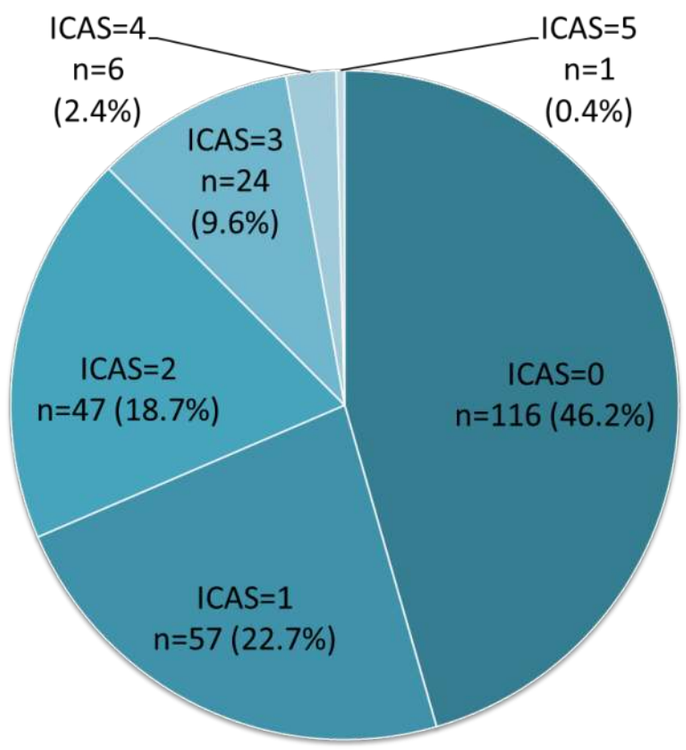

Figure 2: rates of ICAS in our cohort

- Mean ICAS was greater in PVL vs. TVL patients (table 2)
- More patients with PVL had ICAS ≥3 (table 2)
- Mean No.RFs was 1.4 for ICAS <3 and 2.3 for ICAS ≥3 (p=0.003)

Table 2: ICAS in TVL vs. PVL patients

	All	TVL	PVL	p value
CTAs assessed	251	152 (61%)	99 (39%)	-
Mean ICAS score	1.0	0.8	1.3	0.005
ICAS score ≥3	31 (13%)	12 (8%)	19 (19%)	0.008

- 246 patients had both a CTA and Doppler ultrasound
- There was moderate correlation between CS and ICAS (Pearson correlation coefficient *r*=0.352, p=0.000)
- 43 patients had significant CS ≥50%, and these patients were more likely to have ICAS ≥3 (table 3)

Table 3: ICAS compared to carotid stenosis (CS)

	CS <50%	CS ≥50%	OR	95% CI	p value
ICAS <3	182 (90%)	33 (75%)	-	-	-
ICAS ≥3	21 (10%)	10 (23%)	2.6	1.1-6.1	0.02

Conclusions

- This is the first description of ICAS in retinal ischaemia
- 12% of patients in our cohort had visible ICAS on CTA
- Patients with ICAS ≥3 had more vascular risk factors
- ICAS was more severe in patients with PVL vs. TVL
- Patients with significant CS of ≥50% were more likely to have ICAS ≥3

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