

USEFULNESS OF OCT IN DIABETIC EYE SCREENING

NEC
NEC Care

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INTRODUCTION

Implementation of Optical Coherence Tomography (OCT) for assessment of diabetic maculopathy in Digital Surveillance (DS) patients can have a significant impact on the number of referrals to HES (Hospital Eye Services). Early detection of maculopathy can improve outcomes.

We undertook a pilot project on the use of OCT for the DS patients in our programme (Central Mersey).

AIMS

- To assess the efficacy of using OCT on persons with diabetes undergoing DS.
- To assess how using OCT alongside RDS imaging would impact on clinic efficiency.
- To quantify whether OCT grading and outcomes have a direct impact on HES referrals.

PATIENT DEMOGRAPHICS

- 250 persons with diabetes
- Female: 87 Male: 163 M:F 2:1
- Mean age: 61yrs
- DS pathway: 3 month 134
6 month 95
HES discharge 21

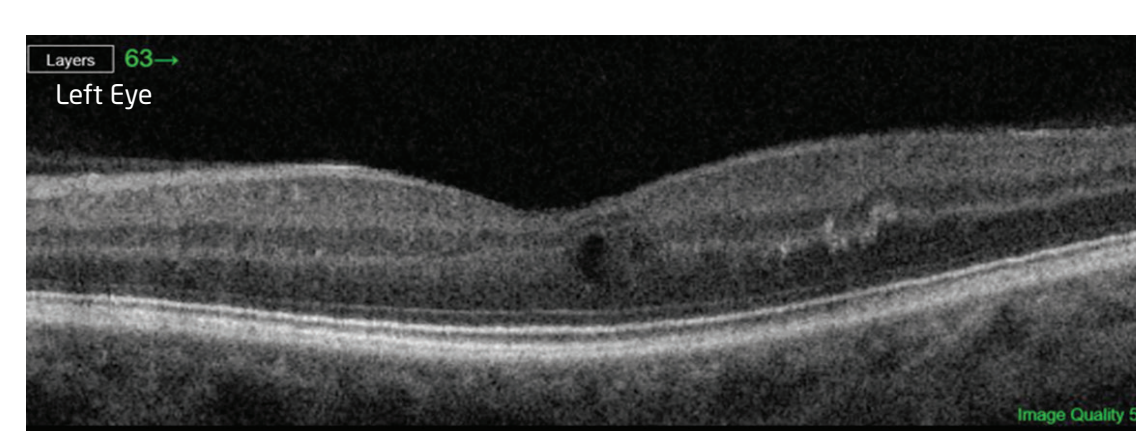
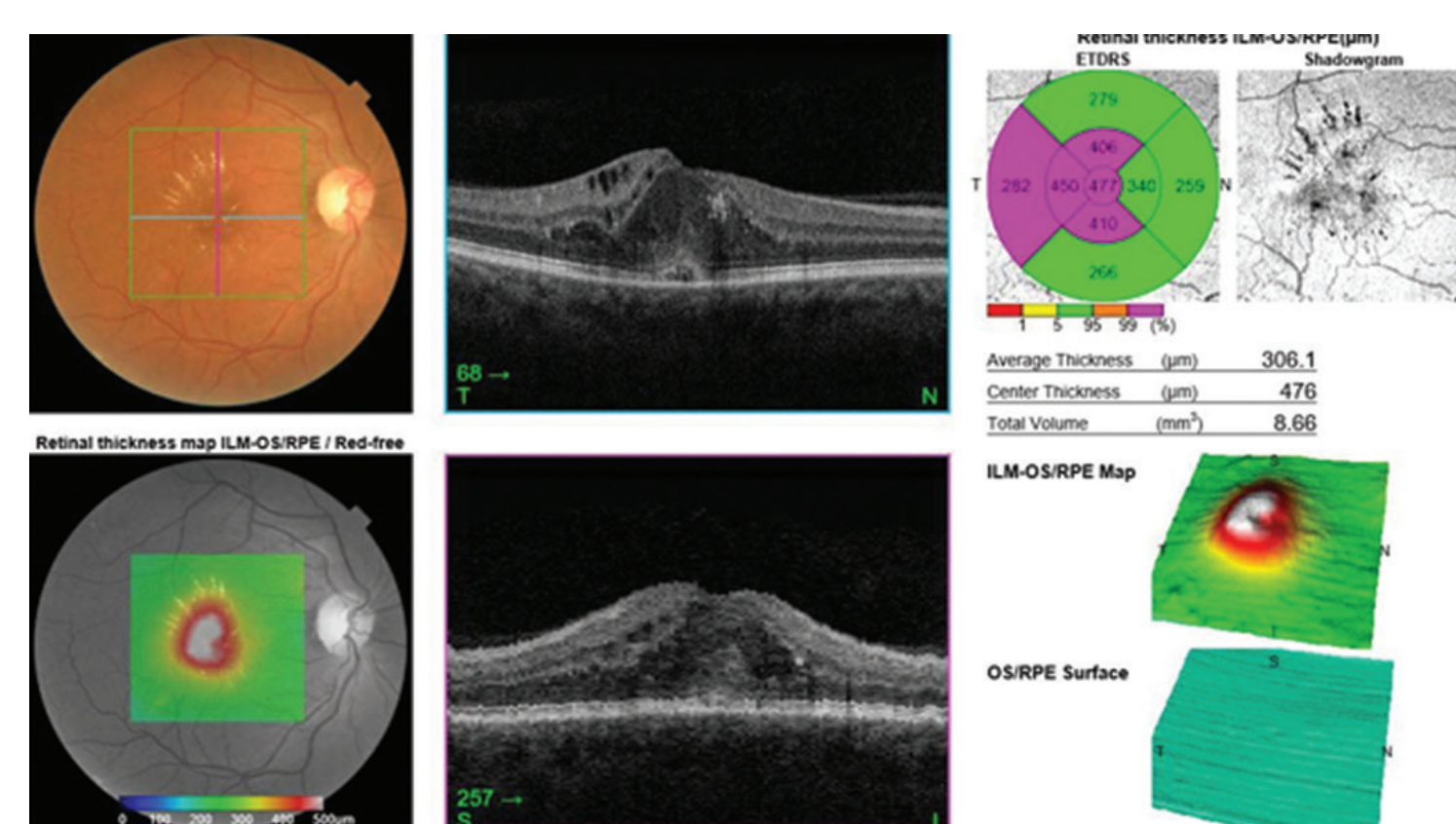
METHODS

- Topcon GB kindly loaned us their 3D Maestro OCT for a 6-month period from June 2022 to Dec 2022.
- OptoMize was installed on to the capture PC, enabling images to be uploaded to patient records using 'Live' mode.
- Only DS persons were recruited for the trial and all from an adjoining RDS clinic.
- A 3D volume macular scan was performed on each eye within the Maestro Capture software. A thickness map giving a value for central macular thickness was generated.
- Analysis and interpretation of the scans was performed immediately after each patient by an experienced OCT imager with expertise and qualification in analysis and diagnostic interpretation.
- Jpegs of the OCT scans including the thickness map were exported and imported into each individual's record within OptoMize.
- Primary DS grading of the RDS images only was undertaken. In Central Mersey, ALL primary DS grades are secondary graded by a senior ROG grader.
- For this cohort of subjects with OCT imaging, secondary grading was undertaken by myself (RH) and our Clinical Lead (IK).
- Primary grade, visual acuity, fundus images and OCT images were all assessed.
- The grading form allowed us to grade the OCT images as Positive, Negative or Borderline.

Topcon Maestro OCT

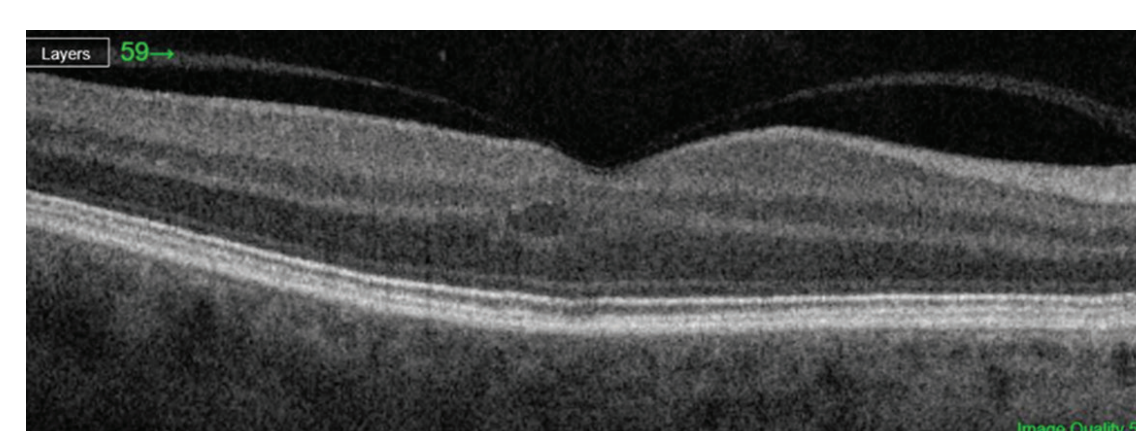
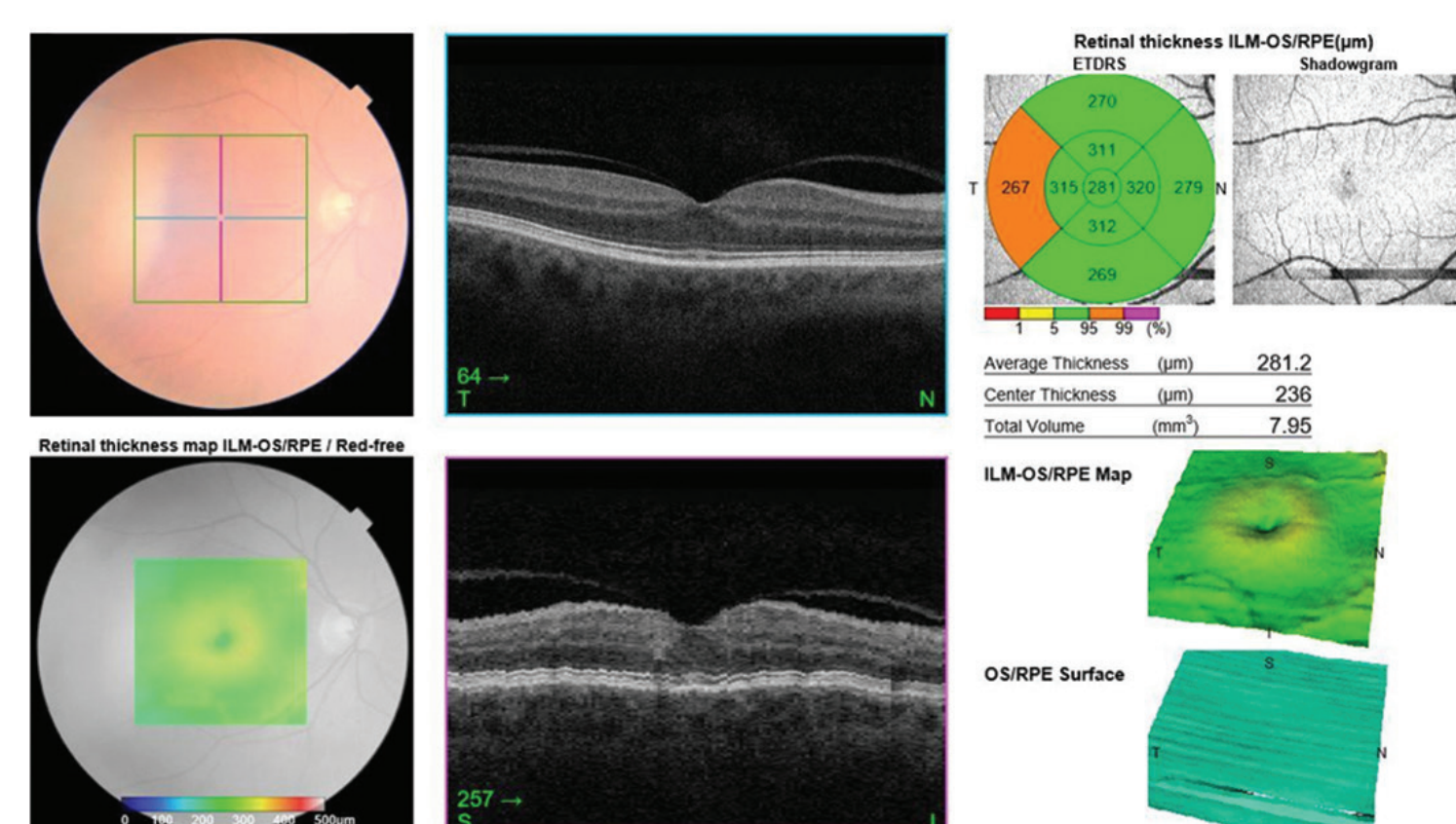


DR PATHOLOGY



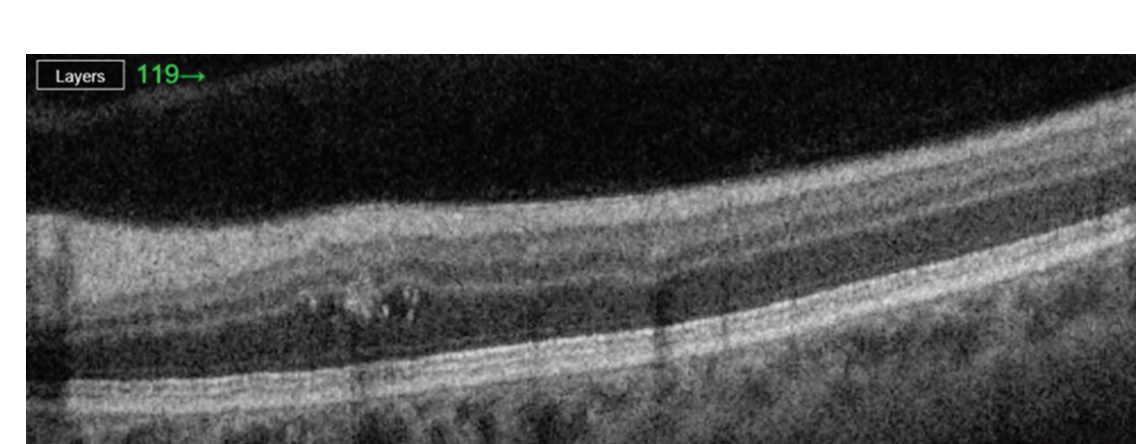
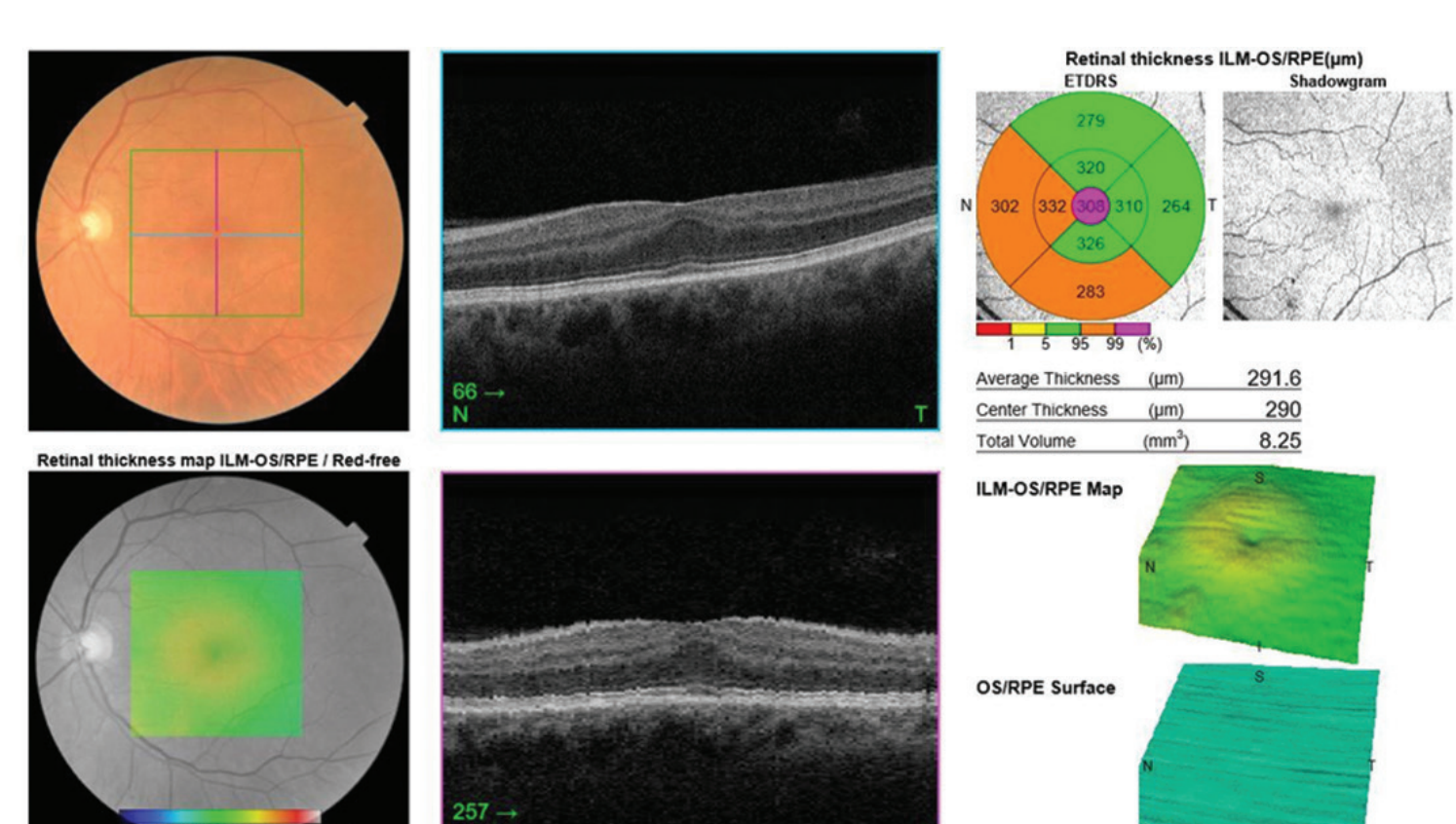
Patient DC

RE OCT Positive, large intra retinal cysts, CMO, central thickness 477µm
LE OCT Positive, single intra retinal cyst with change in foveal contour, central thickness 266µm
Outcome: HES referral



Patient SJ

RE OCT Positive, single intra retinal cyst with change in foveal contour, central thickness 281µm
Outcome: HES referral



Patient AR

LE OCT Borderline, single intra retinal cyst superior arcade, central thickness 308µm
Outcome: 6 month DS

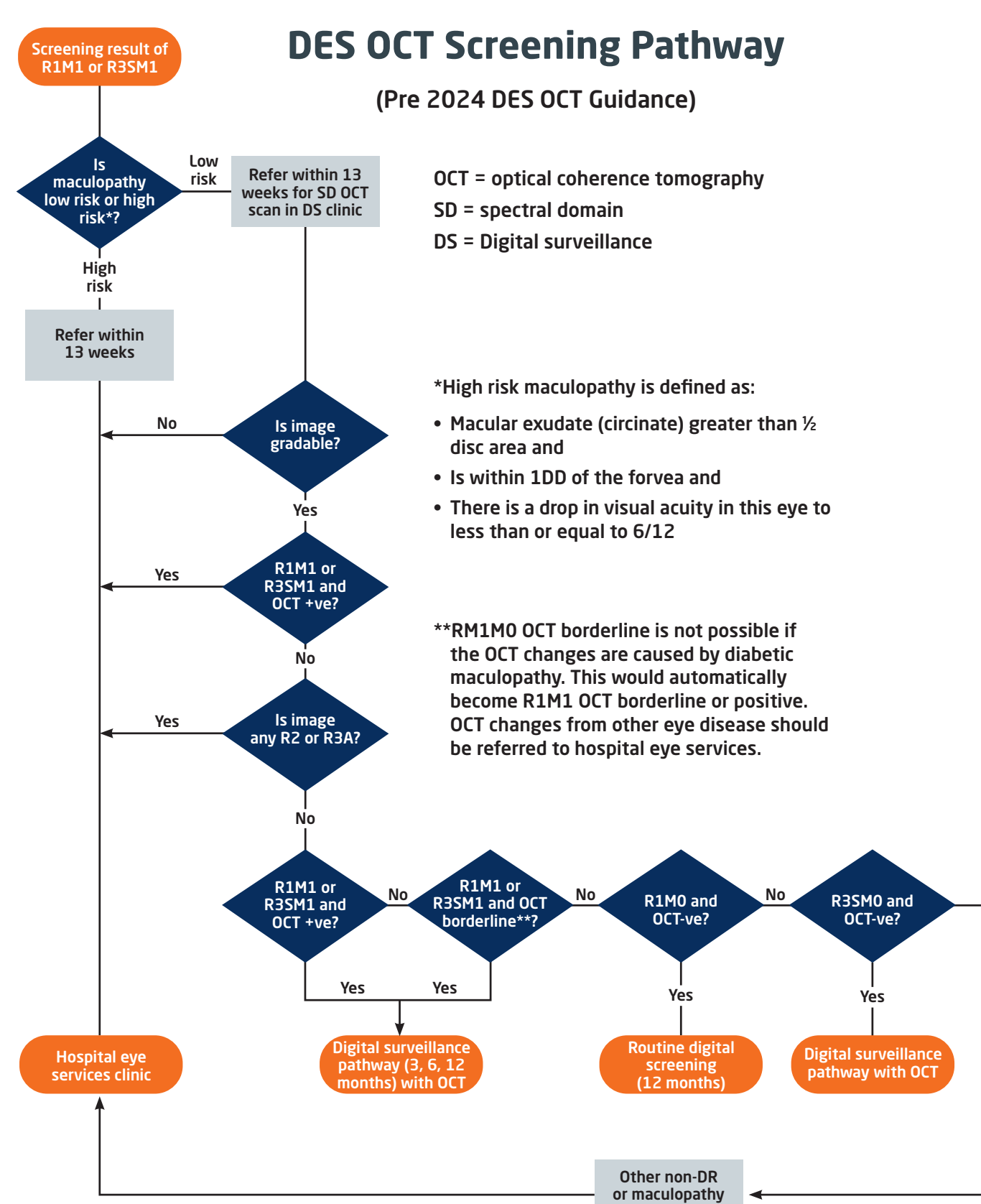
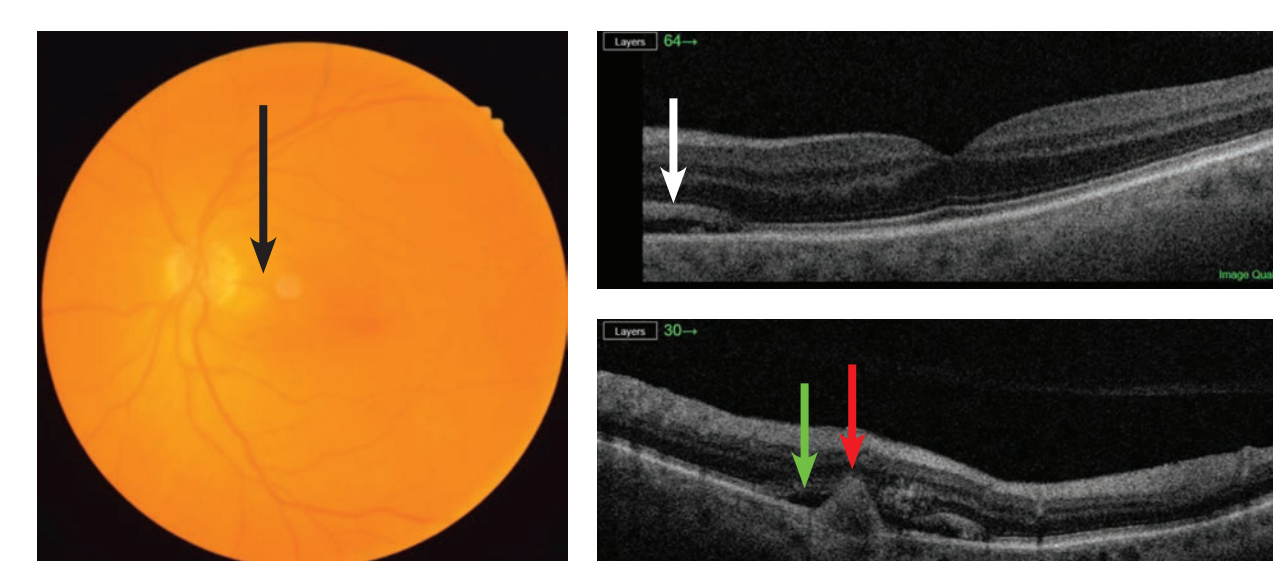


Table 1

NON DR PATHOLOGY



Patient EE

LE asymptomatic. Some peripapillary disturbance temporal to disc (black arrow). Small area of sub retinal fluid (white arrow) temporal to disc. Small Pigment Epithelial Detachment (PED) (red arrow) with associated sub retinal fluid (green arrow). Patient was referred to HES as Peripapillary Choroidal Neovascular Membrane.

OCT GRADING

OCT positive is intraretinal cysts and one or more of:

- A change in the foveal contour
- An area of retinal thickening greater than ½ disc area, the edge of which is within 1DD of the central fovea
- An area of retinal thickening greater than 1 disc area within the macular

OCT borderline is:

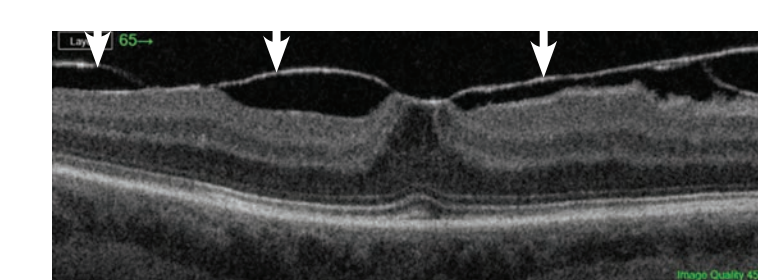
- Intraretinal cysts with no change in the foveal contour
- An area of retinal thickening less than 1 disc area within the NHS Diabetic Screening Programme definition of the macular

OCT negative is:

- The absence of OCT Positive or Borderline criteria

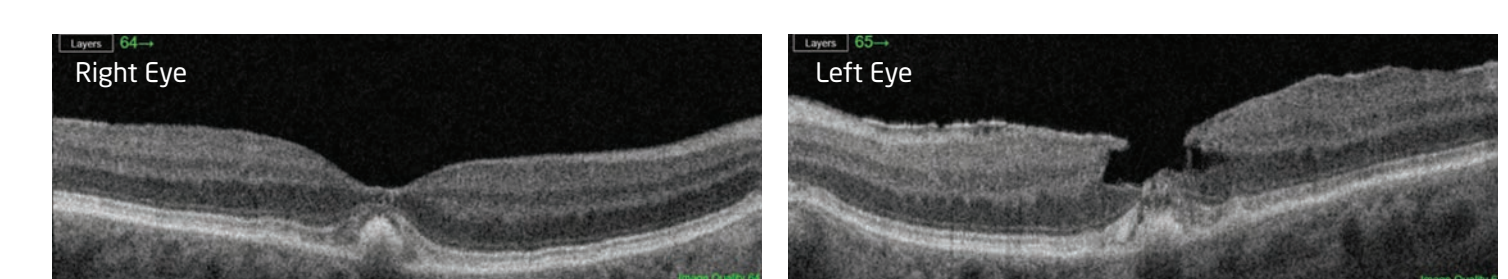
OUTCOMES OF OCT DS CLINICS

- OCT positives** should be referred to HES
- OCT borderline** should be monitored in OCT DS clinics 3 monthly
- OCT negatives** can be monitored 6 monthly in OCT DS clinic if M1 or in photographic DS clinic if MO



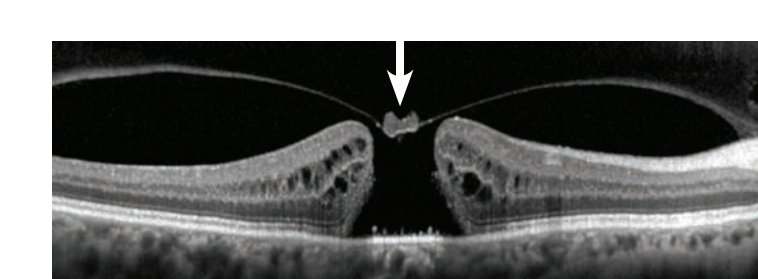
Patient RT

RE Vitreomacular Traction (VMT). VMT is usually caused by part of the vitreous jelly remaining stuck to the macular during a posterior vitreous detachment (white arrows). Patients may experience distortion. People with certain eye conditions (vein occlusions or diabetic retinopathy) can be at a higher risk of developing VMT. This patient was referred to HES as non DR.



Patient DS

Right Eye; Vitelliform Macular Dystrophy
Left Eye; Lamellar Hole (partial thickness macular hole). Patient was already under HES for monitoring.



Patient AR

Full thickness macular hole of the right eye. A macular hole is a retinal break commonly involving the fovea. Idiopathic macular hole is the most common presentation. Risk factors include age, female gender, myopia, trauma or ocular inflammation.
Note the operculum (white arrow).
This patient was referred to HES as urgent as they were symptomatic.

RESULTS

85 (34%) had a NEGATIVE result:

- Out of these: 66 (77%) had their DS interval increased from 3 month to 6 and 9 month.
- With OCT, there were no HES referrals. Without OCT, 9 of these patients would have been referred to HES as M1.**
- 165 (66%) had a BORDERLINE or POSITIVE result.**
- Out of these: 22 (13%) had a positive result in one or both eyes. **With OCT, 14 of these were referred to HES. Without OCT, 20 patients would have been referred.**
- 143 (87%) had a borderline result in one or both eyes. With OCT, there were no referrals to HES. Without OCT, 7 would have been referred to HES but were kept in DS pathway. All 143 borderline patients were kept in DS pathway, over half would have been kept on 3 month DS, but were converted to either 6 or 9 month DS using OCT.

SUMMARY

- There were 14 HES referrals when applying OCT, without OCT there would have been 36 referrals.**
- There was 100% agreement between Clinical Lead (IK) and Senior ROG grader (RH) on analysis and interpretation of OCT images.

CONCLUSIONS

- Undertaking extra OCT imaging only had a limited impact on the running of the DS clinic as carried out by an experienced OCT imager.
- Adding OCT analysis allowed us to confidently assess severity of any maculopathy and associated intra retinal oedema/fluid.
- We were confident that any M1 referrals to HES, based on OCT were justified, and equally confident about retaining those in the DS pathway, even with intra retinal fluid/oedema.
- Overall, in our pilot project cohort, when using OCT analysis there was a reduction in HES referrals of 22 (9%).
- There was a significant increase in the DS interval time mainly from 3 month to 6 month DS when using OCT analysis.
- Utilising OCT freed up much needed capacity in HES units and also created more capacity in DESP DS pathways.**