Tumour-associated retinal pigmentation in Choroidal melanoma

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Introduction:

Choroidal melanoma (CM) is the most common primary intraocular malignant tumour.

Tumour-associated retinal pigmentation (TARP) is a previously unrecognised clinical feature seen via fundoscopy as scattered dark-pigmented cells disassociated from the main melanoma mass (Figure 1A&B). It has not been possible to assess clinically if TARP consists of benign or malignant cells.

This study aims to determine the nature of TARP and its therapeutic and prognostic implications.

Methods:

Retrospective data collection of all CM patients at the Liverpool Ocular Oncology Centre (LOOC) with TARP on fundoscopy between 12/01/2020 – 20/01/2023.

The main outcomes and measures included:

- Clinical details of the tumours and the image and scan findings.
- Histopathology and molecular genetic report results including the tumours' chromosome 3 status and the nature of TARP using CD68PG and MelanA immunohistochemical staining.

Results:

23 patients were identified with TARP. The incidence rate was **7.47 per 100 cases** of CMs.

TARP was hypofluorescent on all patients' Fundus Autofluorescence. On OCT scans TARP was present in the retinal and subretinal spaces (Figure 2).

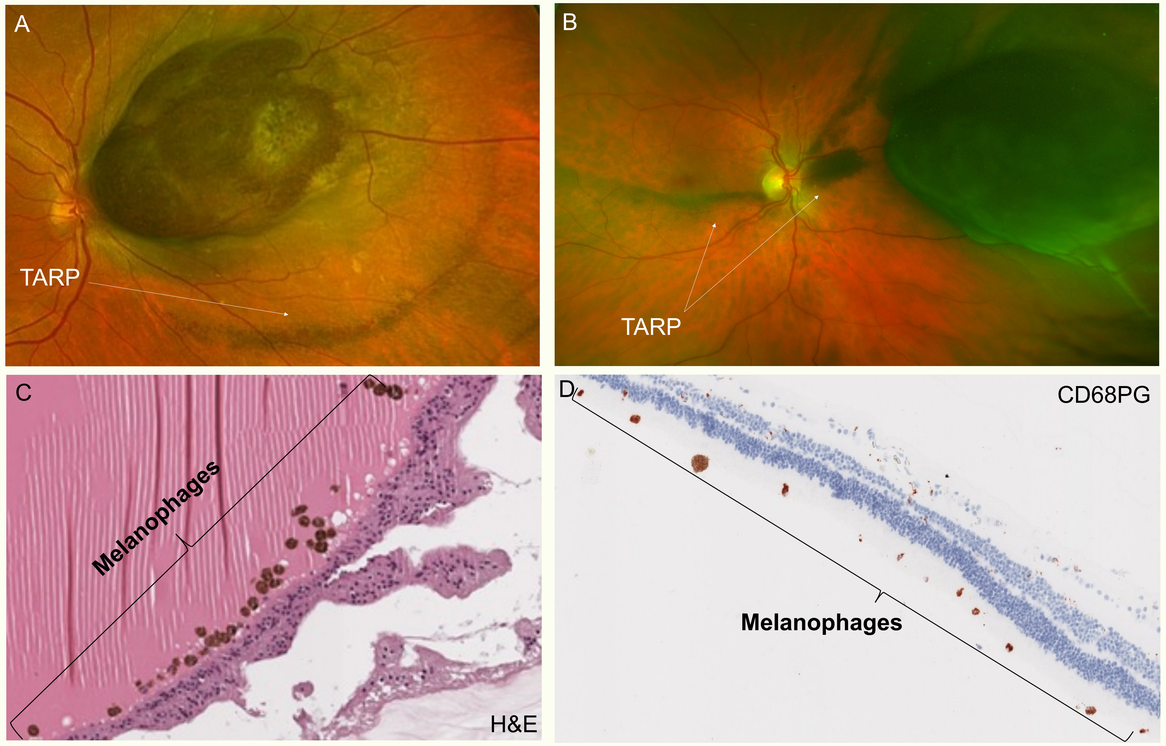


Figure 1. A&B colour fundus images. **C** H&E showing melanophages seen clinically as TARP. **D** CD68PG immunochemical stain confirming intraretinal and subretinal melanophages. MelanA immunostaining is negative for the melanophages (i.e., the TARP area is negative for infiltrating melanoma cells).

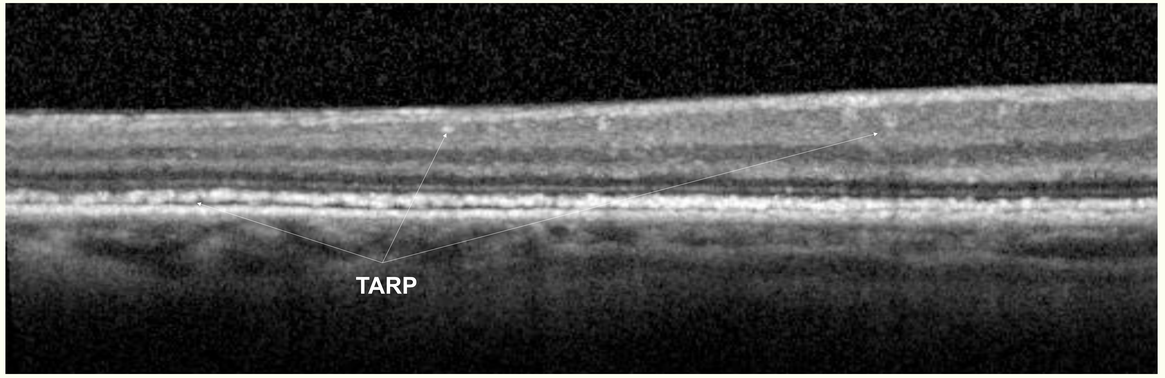


Figure 2. OCT scan demonstrating intraretinal and subretinal cells.

Total patients = 23		
Largest Basal Diameter mean (mm)		16.10
Tumour thickness mean (mm)		8.04
TNM AJCC stage	T1	n = 1
	T2	n = 8
	T3	n = 6
	T4	n = 8
Treatment Received	Enucleation	n = 17
	Radiotherapy	n = 6

Total patients = 20		
Cell type	Epithelioid	n = 15
	Spindle	n = 4
	Mixed	n = 1
Chromosome 3 gain (Monosomy 3)	Yes	n = 18
	No	n = 2
nBAP1 negative	Yes	n = 16
	No	n = 4

Discussion:

We describe in detail the features of TARP in CM for the first time. It is comprised of benign melanophages and over time does not progress; radiation treatments need not involve the TARP area in the treatment plan minimising radiation-related complications.

TARP seems to be associated with larger tumour groups and a more advanced TNM. A high percentage of tumours were monosomy 3 and an epithelioid cell type. All these clinical, histological, and genetic factors are associated with a **poor prognosis**[1,2,3].

TARP represent a subgroup of TAMs, which are cells that have been well-identified as a poor prognostic indicator for metastatic disease in CM[4].

References:

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(3) Jager MJ, Shields CL, Cebulla CM, et al. Uveal melanoma. *Nat Rev Dis Primers.* 2020;6:24.
(4) Bronkhorst IH, Ly LV, Jordanova ES, et al. Detection of M2-macrophages in uveal melanoma and relation with survival. *Invest Ophthalmol Vis Sci.* 2011;52:643-650.