

CEHJ report on the Rb-NET Challenges meeting 2023

The “Rb-NET Challenges meeting 2023” online webinar was held on Nov 10th and attracted over 200 participants who had registered on the Rb-NET website (<https://www.rb-net-mdt.org/>).

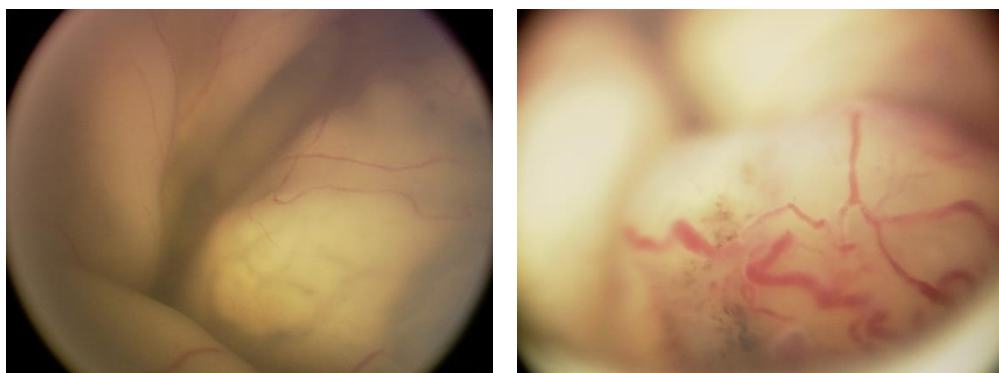
Cases were presented by Ashwin Reddy, Vera Essuman, Francis Munier, Purnima Rajkarnikar Sthapit and Andrew Stacey. The meeting was led by Didi Fabian and moderated by Laurence Desjardins and Nick Astbury.

Guest Speaker Prof Alfred Sommer gave a short presentation on his landmark work proving that Vitamin A supplements not only prevent blinding eye disease but dramatically reduce mortality from childhood diseases such as measles and diarrhoea. UNICEF estimates that between 1998 and 2000 as many as 1 million child deaths may have been prevented because of the global vitamin A supplementation program. His work is described in this recent article from Johns Hopkins (Ref: [Johns Hopkins 2022](#)).

Five challenging cases were presented and participants were asked to anonymously vote by zoom poll to answer questions on diagnosis and management.

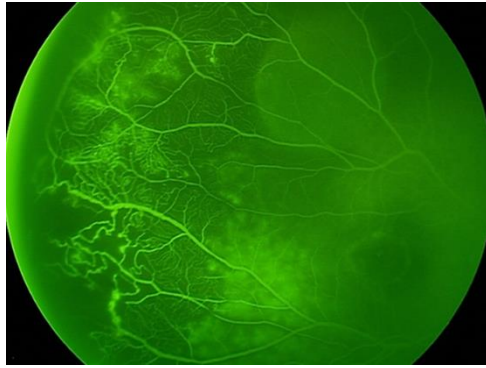
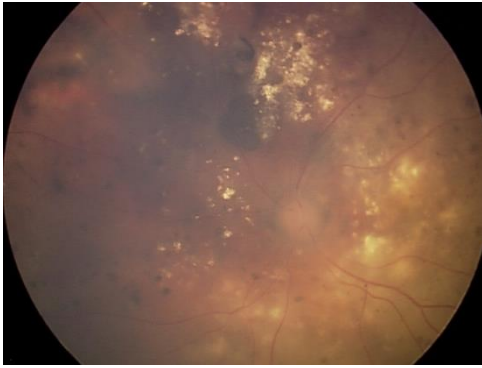
Case 1 was presented by Ashwin Reddy from the Royal London Hospital and Moorfields, London.

A 2-year-old boy when examined under anaesthetic was found to have this appearance in his right eye. The left eye was normal. The lesion was yellowish. The ultrasound showed no calcification and MRI showed a fluid filled eye.



Participants were asked whether they would 1. Enucleate for pathological diagnosis, 2. Give systemic chemotherapy, then enucleate, 3. Continue follow-up as not retinoblastoma clinically or 4. Discharge as there is no need for further examinations under anaesthesia?

The correct answer was 3 as clinically the lesion was characteristic of Coats disease. This photograph was taken 3 months later and shows a shallow retinal detachment and exudates, whilst the fluorescein (IV 0.1 ml/Kg of 10% and blue filter on indirect ophthalmoscopy) demonstrates telangiectatic retinal vessels.



Case 2 was presented by Vera Essuman from Korle Bu teaching Hospital, Accra, Ghana.

A 5-year-old girl presented with a history of whitish colouration in her left eye. She had been coughing with a fever in the preceding two weeks when she was on the paediatric ward. She had received some intravenous drugs during the admission but currently has no systemic symptoms. She gives a history of having an eye condition which had been going on for the past 3 years which needed repeated treatment including surgery in her other eye.

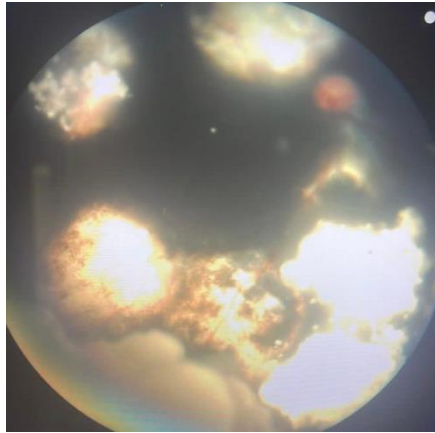


Participants were asked their opinion on a working diagnosis: 1. Endophthalmitis, 2. Suppurative Keratitis 3. Anterior Uveitis or 4. Retinoblastoma

Given that the correct answer was retinoblastoma, the next questions were on the next steps:

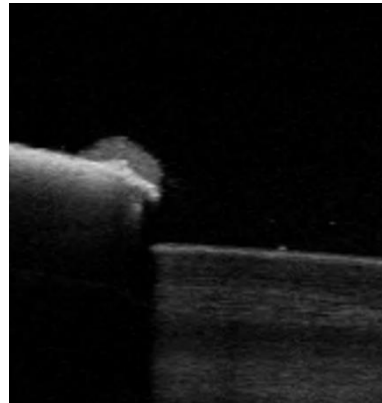
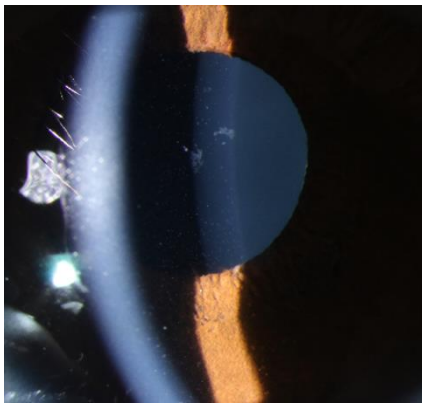
1. Do a full eye examination, including dilated funduscopy, 2. Administer topical antibiotics ± steroids, 3. Perform an anterior chamber tap for cytology, culture and sensitivity, or 4. Carry out a systemic evaluation with the involvement of a paediatrician?

The first option was correct - Do a full eye examination, including dilated funduscopy. She has a left pseudohypopyon due to retinoblastoma. Her right eye was enucleated three years earlier and she received multiple intravenous chemotherapy and focal treatments including transpupillary thermotherapy, intravitreal chemotherapy and intra-arterial chemotherapy. She had developed a chest infection due to neutropaenia explaining the cough. Her diagnosis was confirmed on examination of the posterior segment reinforcing the importance of a full eye examination. Endophthalmitis and suppurative keratitis are ruled out because the anterior segment of the eye is quiet, with no hyperaemia of the conjunctiva. The iris of this child also showed neovascularization and tumour deposits.



Case 3 was presented by Francis Munier from the Jules-Gonin Eye Hospital, Lausanne, Switzerland. Late isolated relapsing aqueous seeding in an only eye

A one-year-old child was diagnosed with bilateral retinoblastoma, Group D in the right eye and Group B in the left. The child had multiple treatments including 18 intra-venous and 11 intra-arterial courses of chemotherapy plus proton therapy. The right eye had to be enucleated because of a relapse. The child was referred to Lausanne with persistent cells in the aqueous of the left eye and deposits on the lens, iris and angle. However the retina and vitreous were entirely tumour free. The left vision was 20/20, the intraocular pressure was normal and there was no neovascularisation of the iris. So what to do next? 1. Secondary enucleation + adjuvant chemotherapy, 2. Brachytherapy to the anterior segment, 3. Proton-therapy to anterior segment or 4. Intracameral chemotherapy?

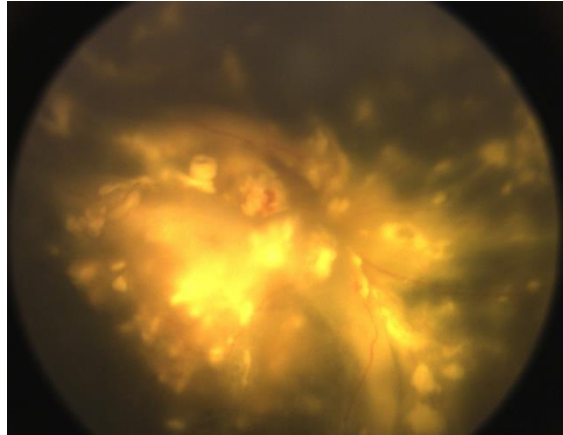


The correct answer was 4. Intracameral chemotherapy. Enucleation was not indicated for an only eye and Intracameral chemotherapy has been used successfully for aqueous seeding. In this case the child required 4 injections in the left anterior chamber with intravitreal cover as well. After 17 months there was no recurrence nor complications such as cataract and the vision remained good.

Case 4 was presented by Purnima Rajkarnikar from the Tilganga Institute of Ophthalmology, Kathmandu, Nepal

A one-year-old boy was brought in with an 8 month history of a white reflex in the right eye. The anterior segment was normal but there was a large white mass in the vitreous cavity with a total retinal detachment. The optic disc was not visible. A CT scan showed calcification but no invasion of the optic nerve. The left eye was normal. A diagnosis was made of right retinoblastoma Group E, stage 0. The child received standard dose neo adjuvant chemotherapy with VEC before a

planned enucleation. This image taken after the second cycle of VEC showed considerable improvement with 50% of the tumour calcified and reduction of the retinal detachment.



An EUA after the fourth cycle showed further regression but the optic disc was not visible behind the tumour. However after the 6th cycle the tumour had increased in size significantly and there was localised vitreous haemorrhage.

So what to do next? 1. External beam radiotherapy, 2. Give higher dose of intravenous chemotherapy, 3. Refer to India for intra-arterial chemotherapy, or 4. Convince the parents that the child required an enucleation?

The parents were convinced that enucleation was necessary. At surgery the optic nerve was inelastic and tight and there was a bulbous swelling near the insertion. Histology confirmed retinoblastoma, focal choroidal invasion and the optic nerve head and cut margin invaded by tumour. The IRSS staging was upgraded to IIIa (orbital involvement) but no atypical cells were seen in the CSF. The child received 12 cycles of high dose chemotherapy and orbital radiation.

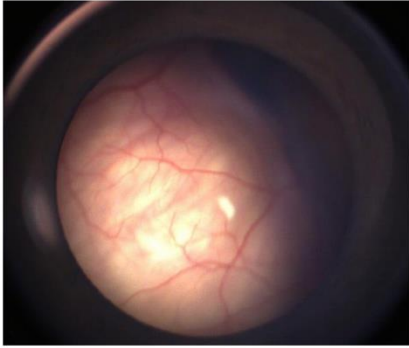
The clinical pearls from this case were:

- There can be a grey line between group E and orbital RB (optic nerve invasion); hence don't hesitate to overtreat
- If the optic disc is not visible on examination, even if the main tumor appears to be regressing, be cautious of optic nerve invasion
- Consider repeated MRI scans when needed.

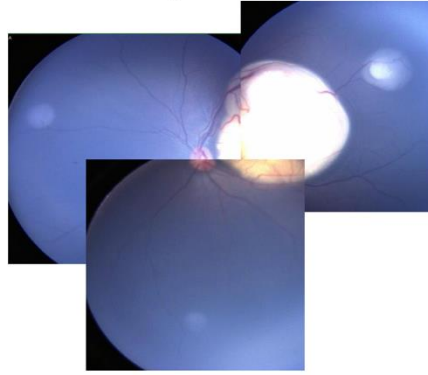
Case 5 was presented by Andrew W. Stacey, University of Washington, and Seattle Children's Hospital, Seattle, US

A 4-month old girl with no family history presented with right leucocoria and a large anterior/equatorial tumour. The left eye had multiple tumours including a large lesion at the macula. The right optic nerve head and macula appeared uninvolved. After discussion it was decided to opt for intra-arterial treatment (IAC) with Melphelan, Topotecan and Carboplatin.

Right Eye



Left Eye



However unexpectedly 3 weeks after the first IAC, the right eye underwent sudden phthisis with the globe shrinking from 20mm to 13mm. The globe was disorganised but the sclera not invaded.

So what to do next? 1. Continue intra-arterial chemotherapy to both eyes, 2. Observe the right eye, continue intra-arterial chemotherapy to the left eye, 3. Enucleate the right eye, continue intra-arterial chemotherapy to the left eye, or 4. Enucleate the right eye and switch to intravenous chemotherapy.

The suggested answer was to enucleate the right eye and switch to intravenous chemotherapy. In the event the right eye was enucleated. It was disorganised but there were no active Rb cells or ON invasion. There were two concerns – firstly why had phthisis occurred? Could there be high risk features that had not been recognised? Secondly with a phthisical eye histology cannot be relied upon. There still could be high risk features. Regression could be incomplete. It was decided to precede with IVC because high risk features could not be ruled out completely and secondly there was no explanation why the IAC had caused phthisis in the first place. So best not to do any more. The patient had 6 cycles of IVC and a year later the left eye was stable. If in the future the left eye recurs a decision would have to be made whether to (risk) using IAC again.

The Rb-NET

The International Centre for Eye Health (ICEH) based at the London School of Hygiene & Tropical Medicine (LSHTM) has established the Retinoblastoma Network (Rb-NET) in order to improve survival, salvage of the eye, preservation of vision and improvement of quality of life of children diagnosed with retinoblastoma.

One of its main projects is the Rb-NET Multidisciplinary Team (MDT) that hosts regular virtual meetings. This year 23 MDT meetings have been held for eight countries. Following each presentation, there is a full and open discussion about the case, with an international panel contributing suggestions as to how best each child can be managed, within the limitations of the options available in the country.

Rb-NET MDT project goals

- To improve the quality of care of children diagnosed with retinoblastoma at remote and rural areas.
- To support global eye health during the COVID-19 pandemic.
- To improve collaboration between health centres within a country and across countries.

- To enable effective dissemination of knowledge on retinoblastoma disease.
 - To enable an educational platform for all healthcare providers (interns, residents, fellows, and consultants).
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The Rb-NET Challenges meeting 2023 is available to view on <https://www.youtube.com/watch?v=kFK3F2dzmlU>

Nick Astbury 12-11-23