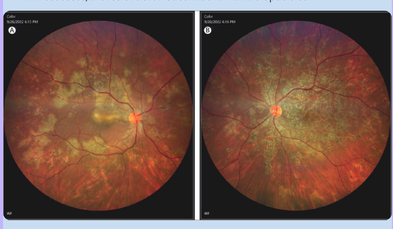
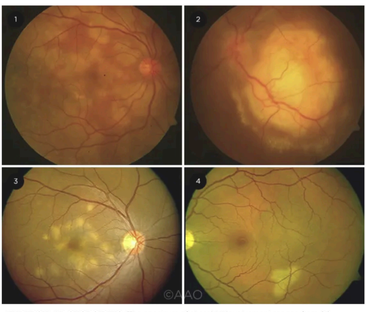
- **Tubercular Posterior Uveitis**
  - The most common variant of ocular TB is tubercular posterior uveitis.
  - The COTS-1 trial demonstrated that approximately 36% of participants had disease isolated to the posterior pole.
  - A more precise term to describe this constellation of diagnoses is tubercular choroiditis.
  - There are a variety of different choroiditis phenotypes discussed below.

- **Serpiginous-like Choroiditis (TB SLC)**
  - This diagnosis describes single to multiple discrete yellowish-white fuzzy choroidal lesions with slightly raised edges that show a wave-like progression of disease.
  - On fluorescein angiography (FA), there is a hyper-fluorescent serpiginous-like edge with central healing.
  - In most cases, the lesions are not confluent with the optic disc.



- **Tubercular Multifocal Choroiditis (TMC)**
  - This diagnosis describes multifocal choroiditis lesions with a phenotype like idiopathic multifocal choroiditis, acute posterior multifocal placoid pigment epitheliopathy (APMPPE), and other phenotypes that do not resemble TB SLC.
  - Within the TMC phenotype, the COTS group has included choroidal tubercles.
  - Tubercles are single/multiple, small (<0.5-disc diameter), discrete grayish-white lesions with a central core and surrounding rim of inflammation caused by hematogenous spread typically in a patient with miliary disease.
  - During periods of active inflammation, the tubercules have indistinct borders due to a rim of inflammation but become pigmented scars once inflammation subsides.
  - When evaluated via optical coherence tomography (OCT), commonly you will see a hypo-reflective choroidal granuloma with overlying subretinal fluid.

- **Tubercular Focal Choroiditis (TFC)**
  - This name describes unifocal choroiditis lesions that do not resemble TB SLC.
  - The lesions of TFC resemble those of TMC and tuberculomas but are differentiated based on the quantity of lesion.



TUBERCULAR CHOROIDITIS. The spectrum of choroidal involvement ranges from (1) tubercular serpiginous-like choroiditis to (2) tubercular multifocal choroiditis, (3) tuberculoma, and (4) tubercular unifocal choroiditis.

- **Tuberculoma**
  - A tuberculoma is a single or multiple yellowish subretinal lesion(s) with indistinct borders and surrounding exudative fluid typically in the posterior pole or mid-periphery.
  - Additionally, there will be an oval/round lesion in the choroidal stroma.
  - On OCT, these lesions appear like TMC with a hypo-reflective choroidal granuloma with overlying subretinal fluid.
  - Classically, the 'contact sign' is seen where a connection between retinal pigment epithelium and choriocapillaris is seen in 20.5% of the patients.
  - Currently, it's unknown if the optic neuropathy develops as a result of direct bacterial infection or an immune reaction to bacterial antigens.

- **DIAGNOSIS OF OCULAR TUBERCULOSIS**
  - Due to the vast phenotypes associated with OTB, establishing a definitive diagnosis is challenging.
  - The four most predictive clinical signs (broad-based posterior synechiae, retinal vasculitis without choroiditis, retinal vasculitis with choroiditis, and serpiginous-like choroiditis) demonstrated sensitivities of 32%, 25%, 10%, and 14%, respectively.
  - The low sensitivities of these exam findings make it difficult to rule out OTB in their absence.
  - The gold standard for definitively diagnosing OTB is via direct staining or culture growth of the MTB obtained from ocular fluid or tissue biopsy.
  - Unfortunately, these samples are difficult to obtain, commonly yield low bacterial counts, and culture growth can take 4–6 weeks at a minimum.
  - Nucleic acid amplification tests (NAAT) have been used to increase diagnostic yield of fluid samples.
  - One example is multitargeted polymerase chain reaction (PCR) assays.
  - Sharma et al. developed a PCR assay that targets IS6110, MPB64, and protein b.
  - They reported a sensitivity of 77.77% and specificity of 100% on a cohort of 25 participants.
  - Other variants of NAATs such as the commercially available Gene Xpert MTB/RIF (GX) and GeneXpert MTB/RIF Ultra assays are commonly used for suspected pulmonary TB to assess for disease presence and rifampicin resistance and on a test on vitreous fluid had a sensitivity of 22.3% and specificity of 100%.

- **Immunological Tests and Radiology**
  - Commonly, clinicians utilize the results of serum testing and radiography to suggest MTB as the diagnosis.
  - Frequently used tests include Tuberculin Skin Test (TST) and/or interferon-gamma assay (IGRA; T-Spot and QuantiFERON-TB Gold).
  - Both tests are not perfect.
  - For example, they are unable to distinguish between active and latent TB.
  - TST tests have low positive predictive value and high false-negative rate in the absence of systemic disease.
  - Studies like T-Spot and QuantiFERON-TB Gold have better specificity but possess high false-positive rates in low TB risk individuals.
  - The diagnostic utility of these immunological tests can be increased with the use of radiological studies.
  - Chest radiographs and chest computed tomography (CT) have been used to evaluate for the presence of active or inactive/healed pulmonary TB disease.
  - Ninety-two percentage of patients in the COTS-1 trial did not endorse symptoms of active TB disease.
  - Interestingly, radiological studies obtained on this group showed inactive or healed pulmonary TB in 26.9% of chest X-rays and 68.8% of chest CTs.
  - To summarize, definitively diagnosing TB with tissue or fluid samples is difficult.
  - Most clinicians establish a presumptive OTB diagnosis with exam findings, immunological test results, and radiology assessment.