

Advances in retinitis pigmentosa and allied diseases

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This presentation will review the published histopathologic findings of patients with retinitis pigmentosa or an allied disease in whom the responsible gene defect was identified, with the outline as follows.

1. Mutations at any of over 150 genes cause forms of retinitis pigmentosa and allied retinal degenerations in humans.

2. Retinitis pigmentosa can be inherited as a dominant, recessive, or X-linked trait. Different genes can cause retinal degeneration with the same inheritance pattern.

3. The classic fundusoscopic features of retinitis pigmentosa can occur in patients with different gene defects because the fundamental histopathologic abnormality is the loss of rod and cone photoreceptors. Associated with these neurons' loss are attenuated retinal vessels (due to a reduction in oxygen needs when fewer neurons are present) and intraretinal pigment deposits (from pigmented macrophages accumulating in the retina in response to the cell death).

4. A survey of cases of photoreceptor degeneration in which both histopathology was available as well as knowledge of the responsible gene defect found 24 cases with defects in a total of 12 different genes.

5. Remarkably, no reports could be found of the histopathology of recessive retinitis pigmentosa with a known gene defect, nor of an individual with common color vision deficiencies (red/green color blindness).

6. The histopathology of 8 patients with dominant retinitis pigmentosa due to rhodopsin gene mutations has been reported. Membranous swirls in the remaining rod

photoreceptors has been observed, as well as inclusion bodies possibly containing aggregates of misfolded proteins.

7. An example is provided of the histopathology of the retina and the cerebellum in a patient with spinocerebellar ataxia 7 and a defect in the SCA7 gene

8. Three cases demonstrating persistent survival of some photoreceptor cells in patients with retinitis pigmentosa. These are the types of patients in whom therapies have a chance of preserving or restoring visual function long after symptoms of reduced vision.

9. Additional studies of the histopathology of patients with retinal degeneration with known gene defects are to be encouraged to learn at which age photoreceptors or other neurons are still available for rescue. The disease is not so rare that cases are not available (1.7 patients with retinitis pigmentosa die each day in the U.S).