

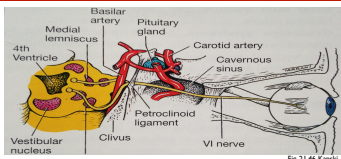


# Abducens Nerve Palsy After Surgical Removal of Acoustic Neuroma

Pamela J. Wendlandt, OD  
 Pediatric/Vision Therapy/Rehabilitation Resident  
 Pacific University College of Optometry



## Abducens Nerve Palsy



- AKA :Cranial Nerve VI
- Innervates the ipsilateral lateral rectus
- Susceptible to damage due to its long anatomical course
- Signs:
  - Esotropia in primary gaze
  - Restricted Abduction of affected eye
  - Compensatory head turn in field of action of paralyzed muscle
- Symptoms:
  - Diplopia
- Causes:
  - Ischemia, trauma, compression, inflammation, demyelination and infection

## Acoustic Neuroma

- AKA: Vestibular Schwannoma
- Benign primary tumor of the Schwann cells of the vestibulocochlear nerve (CN VIII).
- 3,000 Cases diagnosed each year in U.S.
- Cause:
  - Idiopathic
  - Neurofibromatosis Type 1 & 2
- Compression of large tumor can affect:

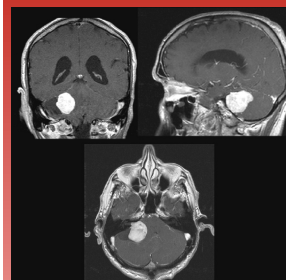
Trigeminal Nerve (CN V)	-Facial Numbness -Reduced Corneal Sensitivity
Abducens Nerve (CN VI)	-Esotropia
Facial Nerve (CN VII) *rare*	-Sublingual & lacrimal Glands -Muscles of facial expression -Taste

- Diagnosed with: MRI with gadolinium or contrast enhanced CT
- Treatment: Surgical resection or radiotherapy

## Case Presentation

### History

- RK, a 29 year-old Caucasian male was referred for visual evaluation due to diplopia.
- CC: Constant horizontal double vision, worse in right gaze. Unable to return to work due to diplopia.
- Medical History: Significant for ipsilateral facial numbness and hearing loss x 5 years.
- MRI revealed a 3.8 cm right sided acoustic neuroma with associated compression of brainstem.
- RK underwent sub occipital craniotomy to remove acoustic neuroma on 11-13-2013.
- Post-operative symptoms included:
  - Reduced salivation and lacrimation (both resolved before ocular examination).
  - Right-sided hearing loss with associated right sided facial weakness and diplopia.
  - Recommended treatment for diplopia by medical team:
    - Wait 6 months and consider strabismus surgery if not resolved.



[http://www.abducensnerve.com/arge\\_right\\_acoustic\\_neuroma\\_011.jpg](http://www.abducensnerve.com/arge_right_acoustic_neuroma_011.jpg)

### Ocular Examination:

01/14/2014: Sensorimotor Examination  
 BCVA: 20/20 OD/OS/OU  
 Stereopsis: RDS: None, LDS: None  
 CT: Distance: Noncomitant 20pd CRET  
       Near: Noncomitant 18pd CRET  
 EOM: OD: Abduction limited to 50 degrees past midline  
       OS: No restriction  
 Saccades/Pursuits: Jerky  
 Ocular health: Unremarkable



01/23/2014: Neuro-Rehabilitation Therapy: See Treatment

02/10/14: Binocular Vision Progress Evaluation  
 BCVA: 20/20 OD/OS/OU  
 Stereopsis: RDS: None, LDS: None  
 CT: Distance: Noncomitant 16pd CRET  
       Near: Noncomitant 14pd CRET  
 EOM: OD: Abduction limited to 65-70 degrees past midline  
       OS: No restriction  
 Saccades/Pursuits: Smooth  
 Ocular health: Unremarkable



## Diagnosis/Treatment

### Diagnosis:

- Acquired right lateral rectus palsy secondary to acoustic neuroma and/or surgical intervention.

### Treatment:

- 20 pd BO Fresnel prism OD: Relieve diplopia in primary gaze
- Neuro-Rehabilitative Therapy

Technique	Purpose
Vestibular Ocular Reflex Therapy (Doll's Eye Technique)	Stimulate vestibular system to increase range of motion of the visual system
Eye stretches with finger touches	Increase range of motion of the visual system
Pursuit Therapy	Develop accuracy of smooth pursuits
Greenwald Eye Movements	Integrate/match vestibular and ocular input

## Conclusion

As demonstrated by this case, diplopia is a debilitating consequence of trauma to the brain. Neuro-Optometric Rehabilitation (NOR) therapy can decrease the amount of time patient experience diplopia. NOR includes use of lenses, prisms, vision therapy and vestibular-ocular therapies. RK was able to return to work after application of Fresnel prism. Understanding the concepts of neuro-plasticity, timely treatment of diplopia can provide better long term outcomes and improve quality of life for patients.

## References

- Kanski, Jack J. "Neuro-Ophthalmology." *Clinical Ophthalmology: A Systematic Approach*. Sixth ed. Edinburgh: Butterworth-Heinemann/Elsevier, 2007. 822-24. Print.
- Leigh, R. John, and David S. Zee. *The Neurology of Eye Movements*. Fourth ed. New York: Oxford UP, 2006. Print.
- Wong, Agnes M. F. *Eye Movement Disorders*. Oxford: Oxford UP, 2008. Print.

Special Thanks to Jill Schultz, OD, FCOVD, FAAO for her contributions to this poster.