IgG4-related disease causing ocular nerve palsies and orbital apex syndrome

Chung Shen Chean[1], Farhan Javed[2], Aneesa Rahim[1], Rachel Jeffery[2]

[1]*Department of Ophthalmology, Northampton General Hospital, Northampton, United Kingdom*

[2]*Department of Rheumatology, Northampton General Hospital, Northampton, United Kingdom*

Northampton General Hospital NHS Trust

Background

- IgG4-Related Disease (IgG4-RD) is a systemic immune-mediated fibro-inflammatory condition.
- IgG4-RD affecting the head and neck is relatively rare, and can implicate all extra-ocular muscles, structures emerging from the orbital apex, optic canal, or superior and inferior orbital fissure.
- Depending on the structures involved, it can produce different or sometimes subtle clinical presentations, posing diagnostic challenge.

Case presentation

- 36-year-old gentleman
- 2-month history of left sided headache, recurrent ear infections, otalgia, hearing loss and worsening diplopia.
- Initially treated as otomastoiditis (Figure 1) with intravenous antibiotics.
- There was also right partial third nerve palsy confirmed on eye casualty review with MRI and MRA neck requested (Figure 2).
- 2 months later, there was worsening right eye ptosis, proptosis, right relative afferent pupillary defect, reduced visual acuity and colour vision as well as a near-complete ophthalmoplegia. (Figure 3)
- Past medical and ocular history: Nil
- Social history: Cocaine and alcohol misuse

Investigations

Relevant blood tests:

- Mildly raised inflammatory markers. No neutrophilia
- Infective causes excluded, Autoimmune blood tests were all negative.
- No evidence of paraproteinaemia
- IgG subclasses showed raised IgG4 2.082g/L (0.039-0.864)

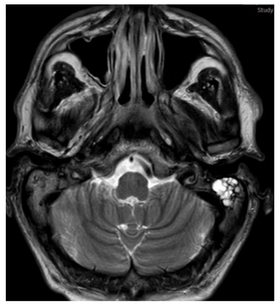


Figure 1: CT head showing opacification of left mastoid air cells and middle ear cavity suggestive of otomastoiditis

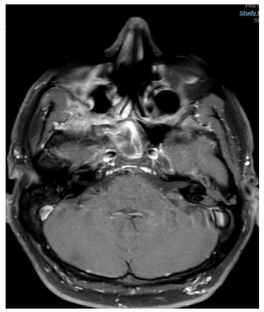


Figure 2: MRI and MRA neck showing multiple perineural enhancement, abnormalities at right inferior orbital fissure, left nasopharyngeal deep tissue and bilateral masticator space

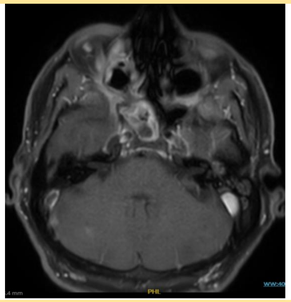


Figure 3:

- MRI head and orbits with contrast showing progression in the volume of the enhancing tissue at right orbital apex and orbital fissures.
- New right optic nerve compression and right eye proptosis.
- Left masticator space and parapharyngeal space swelling at nasopharyngeal level appears mildly more prominent

Differential diagnoses

- Granulomatosis with polyangiitis
- Sarcoidosis
- Lymphoma
- Mucormycosis
- Nasopharyngeal malignancy
- Cocaine-related midline destructive lesions
- IgG4-related disease

Interventions and Outcome

- Significant improvement with tapering regime of oral Prednisolone and antibiotics
- Azathioprine as long term immunosuppression

Histology

- Left nasal mass biopsy performed showing lymphoplasmacytic proliferation but no storiform fibrosis or obliterative phlebitis. (Figure 4)
- IgG4 immunostaining on two assessable fields revealed IgG4: IgG ratio of <10%, and 50% in the other assessable fields. (Figure 5)

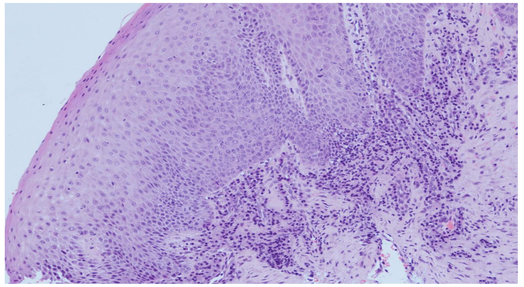


Figure 4: Microphotograph showing plasma cell-rich inflammation in the subepithelial stroma (H&E x10)

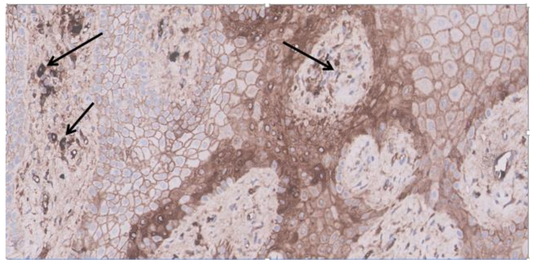


Figure 5: Microphotograph of IgG4 immunohistochemistry staining with arrows pointing towards IgG4 positive plasma cells (x400 magnification)

Conclusion

- IgG4-RD affecting the head and neck region rarely involves skull base
- A high degree of clinical suspicion is necessary to diagnose IgG4-RD when presenting with orbital apex syndrome and ocular nerve palsies
- Its diagnosis should be deliberated on by a multidisciplinary group, with the exclusion of an infectious aetiology before embarking on immunosuppressive therapy

References

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