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Case report of acquired Brown's syndrome due to a mucocoele

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Abstract

***Aim*: To present a case of acquired Brown's syndrome, subsequently found to be caused by the presence of a left fronto-ethmoidal mucocoele.**
***Method:* The clinical details of a woman aged 56 years with sudden-onset diplopia are documented from initial presentation to final results.**
***Results:* An apparent acquired Brown's syndrome was found to be due to a mucocoele in the left fronto-ethmoidal sinus. Surgery to remove the mucocoele was undertaken. A small prism was incorporated into reading glasses for use in the evenings when required.**
***Conclusion:* Binocular single vision was restored following excision of the mucocoele.**

Key words: Brown's syndrome, Diplopia, Mucocoele

Introduction

This report describes a patient with sudden-onset diplopia and a history of a right ear infection who was subsequently found to have a mucocoele in the left fronto-ethmoidal sinus.

Case report

A 56-year-old woman attended the orthoptic department with a history of horizontal and vertical diplopia over the previous few days. A chronic right ear infection had been present for 9–10 weeks prior to the onset of the diplopia and had been treated with antibiotics. The patient reported frequent ear infections over the years and as a child had had a perforated ear drum. Otherwise her general health was reported to be good apart from regular medication for hypertension. The patient was slightly myopic and required a reading addition.

First orthoptic report

Corrected visual acuity was 6/5 either eye. Cover test revealed a small left exotropia with left hypotropia with diplopia. There was moderate restriction of the left eye on direct and dextro-elevation associated with pain on attempted elevation in adduction and an underaction of the right eye on dextro-depression was noted. The deviation was maximum in dextro-elevation. The Lees chart is shown in Fig. 1. A 5^{Δ} Fresnel prism was applied base-up to the left lens of her glasses to relieve the diplopia.

An initial diagnosis of acquired left Brown's syndrome/mechanical restriction was made. The patient did not have symptoms of sinus problems and no proptosis was present. A forced duction test to ascertain a mechanical restriction was not performed in the clinic because the patient felt unable to cope with this procedure at the time.

Further investigation

A CT scan was performed 1 week later. This revealed the presence of a mucocoele from a superior anterior left ethmoid air cell. The mucocoele was extending into the left orbit with erosion of the medial orbital wall and erosion of the floor of the anterior cranial fossa on its supero-medial aspect. No other significant abnormality was seen.

Surgical treatment

The patient underwent left endoscopic surgery 2 months later under the care of an ear, nose and throat surgeon. Unfortunately this procedure could not access the mass. Therefore, 2 weeks later the patient underwent a left orbital exploration performed jointly by an ear, nose and throat surgeon and an ophthalmic surgeon. The mass was successfully excised and confirmed as a mucocoele.

A CT scan post-operatively showed the sinus to be clear of any mass but some bony changes had occurred to the sinus walls.

Three months post-operative orthoptic report

Visual acuity remained 6/5 in each eye with correction. Cover test showed a small exophoria with slight left hyperphoria with moderate recovery. There was L/R in all positions of gaze increasing on depression with diplopia. This was measured at $1–2^{\Delta}$ in most positions increasing to 4^{Δ} in laevo-depression and 5^{Δ} in dextro-depression. Binocular single vision was now present in most areas. Convergence failed at 16 cm. The post-operative Lees chart is shown in Fig. 2.

The patient reported intermittent vertical diplopia, which occurred in the evenings, and a 3^{Δ} Fresnel was applied base-down to the left lens of her glasses. Convergence exercises were also commenced.

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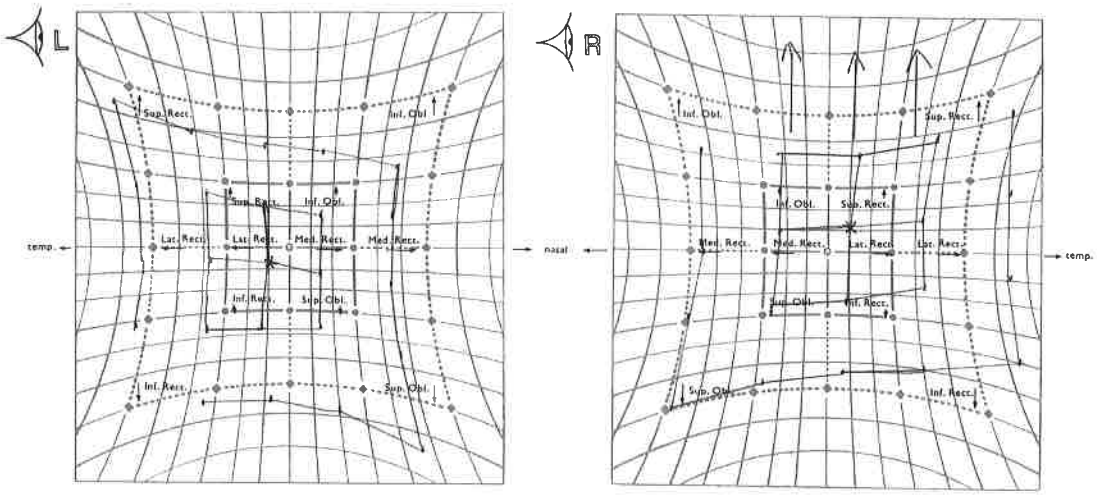

Fig. 1. Lees chart at initial presentation.

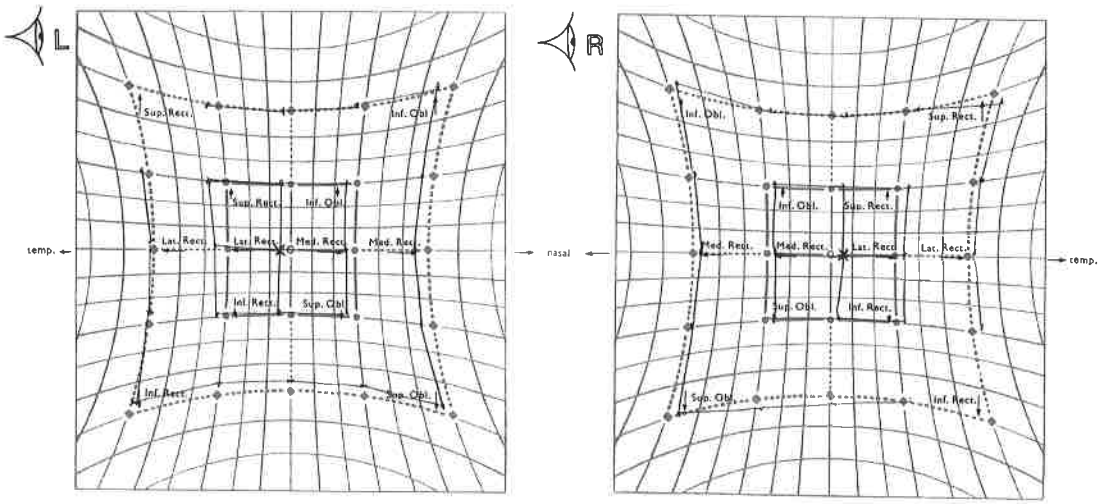

Fig. 2. Lees chart 3 months post-operatively.

Twelve months post-operative orthoptic report

Visual acuity remained good. Cover test showed an exophoria at near and distance, with a minimal left hyperphoria for near. The hyperphoria increased slightly on laevo-depression. Convergence had improved. The Lees chart is shown in Fig. 3. A follow-up CT scan 12 months after surgery showed no sign of any mucocoele.

The patient reported rare vertical diplopia in the evenings when reading. A prism of 2^{Δ} base-down was incorporated in to a pair of reading glasses and was discontinued 18 months later.

Discussion

Brown's syndrome was first described in 1950 by Harold Whaley Brown.[1] Elevation in adduction is limited and can be as a result of a tight or short tendon of the superior oblique muscle. There is normal depression in adduction of the affected eye[2] but cases of limited depression have been noted.[3]

Brown's syndrome can be divided into congenital and acquired groups. Most cases of congenital Brown's syndrome are caused by developmental anomalies of the superior oblique tendon and/or trochlea. Acquired Brown's syndrome can develop secondary to inflammatory conditions such as rheumatoid arthritis; post-operatively following surgery on the superior oblique tendon, orbit, retina or sinus; following trauma to the supero-medial orbit; or as a result of mass lesions of the supero-medial orbit. Examination of this patient suggested a diagnosis of a left Brown's syndrome. From the CT scan this was found to be due to an ethmoidal mucocoele, which encroached into the orbit with erosion of the medial orbital wall.

A mucocoele is a slowly expanding accumulation of mucus secretions and epithelial debris. This formation gradually erodes the bony walls of the sinus and causes symptoms by encroaching on surrounding tissue. The expansion may invade the intracranial space or the orbit.[4] A mucocoele develops when the drainage of

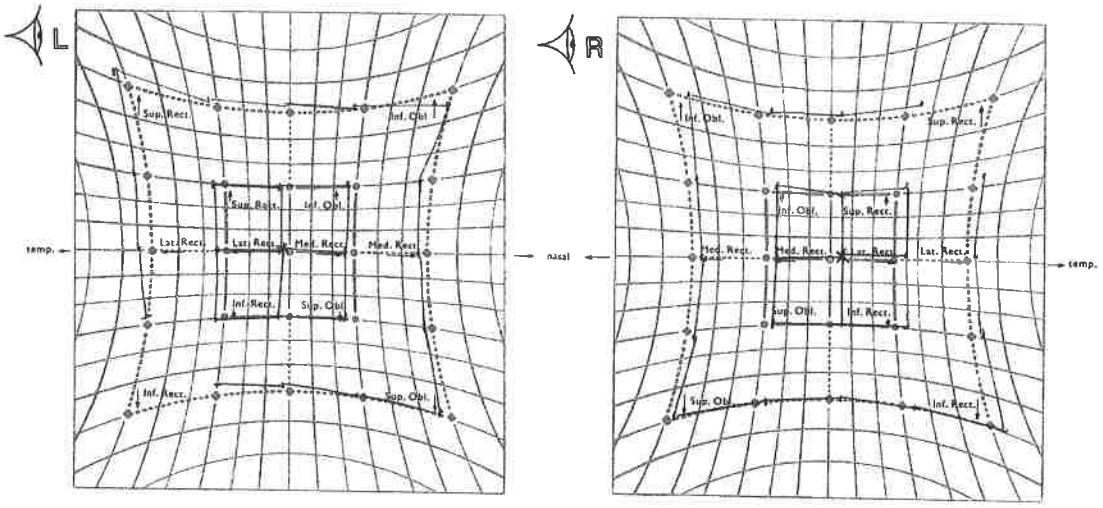

Fig. 3. Lees chart 12 months post-operatively.

normal sinus secretions is obstructed. Orbital invasion usually occurs from frontal or ethmoidal mucocoeles but rarely from maxillary mucocoeles.[4] In the case of ethmoidal mucocoeles, there is a likelihood of proptosis, lateral displacement of the globe and diplopia, visual loss and ptosis.[3]

The orthoptic findings in this case gave the appearance of an acquired Brown's syndrome on the affected side. It has been reported that acquired Brown's syndrome associated with ethmoidal mucocoeles is rare.[1] This patient did not have proptosis or the appearance of globe displacement. The visual acuity remained normal in both eyes, but cases have been reported with severe permanent visual loss due to ethmoidal mucocoeles.[5] The associated history of right ear infection was not significant in this case, though could be an indication of general ear, nose and throat problems, both past and present.

The patient underwent initial endoscopic surgery in an attempt to remove the mass. This is a minimally invasive procedure advocated as the best approach in the first instance,[6] which in this case was not successful in gaining access to the mucocoele. The patient then underwent successful excision by an external approach with limited side-effects. The vertical deviation reversed, requiring a small prism to aid any symptoms of persisting diplopia. The patient's nose was bruised and scarred for some time, necessitating a wider bridged pair of glasses.

Conclusion

The patient regained binocular single vision after an external approach to remove a mucocoele from the left fronto-ethmoidal sinus. The presenting orthoptic signs gave the impression of an acquired Brown's syndrome. The accompanying history of chronic right ear infection was not associated with the aetiology of the mechanical restriction of left elevation.

I would like to thank the patient for giving her permission to report this case.

There are no competing interests.

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