Unusual case of elevator deficit: looking beyond the extraocular muscles

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DESCRIPTION

A 70-year-old man, a non-smoker, presented with diplopia in upgaze for the past 4 months. There was no history of trauma, fever, nasal congestion, discharge or thyroid-related symptoms or no history of sinus surgery. On examination, anterior and posterior segment including pupillary reaction and visual acuity were normal. Slight limitation of upgaze was noted in the right eye with associated vertical diplopia (figures 1 and 2). Hirschberg test showed 5–10 degrees of hypotropia in upgaze, and diplopia charting documented the diplopia (figure 1G). There was no enophthalmos or hypoglobus. The thyroid profile was normal. Non-contrast CT of the orbit and paranasal sinuses revealed right chronic maxillary sinusitis with blockage of the ostium, deviation of the nasal septum and atelectasis of maxillary sinus leading to sagging of the inferior orbital wall. These findings were suggestive of 'silent sinus syndrome' (figures 3 and 4), causing sagging of the inferior rectus and the surrounding soft tissue, thus causing upgaze limitation and diplopia. The patient was referred to the Otorhinolaryngology department where he was managed conservatively.

Vertical diplopia occurs due to an abnormality in either the extraocular muscles or the nerve supplying it. Common differentials are thyroid ophthalmopathy, blow-out fracture with inferior rectus entrapment, neurological causes like superior oblique palsy, neuromuscular junction abnormalities like myasthenia gravis or, in some cases, cysticercosis of the extraocular muscles.¹

'Silent sinus syndrome' is a rare condition where chronic maxillary sinusitis presents with progressive enophthalmos and hypoglobus in the absence of any symptoms of a sino-inflammatory disease.² Kass *et*

Figure 1 Clinical photograph in gazes (A) dextroversion, (B) sursumversion (C) levoelevation (D) dextroversion, (E) primary gaze, (F) levoversion showing limitation of elevation in right eye in gazes (A), (B), (C). Diplopia charting showing vertical diplopia (G).

Figure 2 Hess chart showing limitation of movement in the right eye.

al reported 22 cases of the syndrome, of which 5 had ocular signs.³ Babar-Craig *et al* reported 16 patients, of which diplopia was present in 32% and hypoglobus in 44%.⁴ These ocular features are attributed to long-term ongoing inflammation in the sinus that blocks the osteomeatal complex creating a negative pressure, leading to the collapse of the orbital floor.⁵ Diplopia, if present, is often associated with enophthalmos or hypoglobus. It is

Figure 3 (A) Coronal non-contrast CT of paranasal sinuses and orbit showing contracted right maxillary sinus with inspissated secretions causing sagging of the right inferior orbital wall. Features represent right silent sinus syndrome due to long-standing chronic maxillary sinusitis. (B) Coronal section showing opaque right maxillary sinus with sinking of the inferior orbital wall. (C) Axial section showing deviation of the nasal septum. (D) Sagittal section showing bowing of the inferior orbital wall.

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Figure 4 Axial non-contrast CT of paranasal sinus showing deviation of the nasal septum to the left side (white arrow) and mild inward bowing of the posterolateral wall of the maxillary sinus (yellow arrow).

more commonly seen in middle-aged population with a mean age of presentation of 38.3 years.³ The occurrence in children is rarely encountered as seen in few case reports.^{4,6} Management involves endoscopic sinus surgery to establish free ventilation to the sinus along with orbital reconstruction with implants. Some cases also have spontaneous resolution of ocular symptoms after sinus surgery.⁴ Our patient presented early in the disease process with diplopia due to inferior sagging of the orbital floor

along with inferior rectus and its sheath without hypoglobus or enophthalmos.

Learning points

- All cases of diplopia might not be explained by nerve palsy or extraocular muscle abnormalities.
- Imaging plays an important role in diagnosing certain unusual cases of diplopia.

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