Vertical Strabismus and Positive Bielschowsky Head-Tilt Test: Atypical Presentation of a Maxillary Mucocele

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Abstract

Test of skew has become a cornerstone in the approach of a patient with vestibular symptoms but a detected vertical misalignment may be caused by an oculomotor disturbance and not a skew deviation. We report the case of an elderly patient with a 1-month history of dizziness and visual disturbance that revealed on bedside examination a spontaneous left head-tilt and a pathologic alternate cover test, with right eye hypertropia and excyclotorsion, worse with right head-tilt. Dizziness was assumed to have a visual origin with unrecognized binocular diplopia, caused by an acquired right eye superior oblique muscle palsy. However, imaging revealed a right maxillary mucocele that eroded the orbit floor into the orbit. The change of the intraorbital component of the maxillary fluid-filled mass with head-tilt through a dehiscent orbital floor may explain the findings of vertical strabismus and positive Bielschowsky head-tilt test in this case. Endoscopic treatment improved symptoms and findings.

Keywords

► vertical strabismus
► test of skew
► superior oblique muscle palsy
► skew deviation
► Parks–Bielschowsky test

Introduction

Test of skew has become a cornerstone in the approach of a patient with vestibular symptoms, since the advent of the three-step bedside oculomotor exam (H.I.N.T.S.) and due to its high sensitivity in detecting acute posterior fossae disorders causing dizziness. However, a vertical misalignment detected may be caused by an oculomotor disturbance and not a skew deviation. This clinical report reviews the diagnostic approach and explains the physiopathology of a positive Bielschowsky head-tilt test caused by a maxillary mucocele.

Case Presentation

Eighty-one-year-old patient presented to the emergency department, with a clinical picture of dizziness and unspecific visual disturbance that has started and remained stable over the past month. Past medical history included controlled arterial hypertension and sinus surgery years ago. Bedside examination revealed a pathologic alternate cover test, with right eye hypertropia, worse with right head-tilt. A spontaneous left head-tilt was noted. Right eye excyclotorsion was detected in the fundoscopic examination. Prism and alternate cover test established a vertical misalignment of 14, 26, 6 prism diopters.

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in centered, right, and left head-tilt positions, respectively. With no head-tilt, prism diopters were the same in right and left gaze. No other pathologic signs were detected.

Clinical history and physical examination, with right eye hypertropia and excyclotorsion and positive Bielschowsky head-tilt test, suggested an acquired fourth nerve palsy. Dizziness was assumed to have a visual origin with unrecognized binocular diplopia. The computed tomography (CT) scan showed a right eye subtle hypertropia, caused by a soft tissue density homogeneous mass with a maxillary sinus origin that eroded the orbit floor and had a relevant intraorbital component (►Fig. 1A and 1B). The magnetic resonance imaging (MRI) confirmed the mass as a maxillary mucocele (►Fig. 1C and 1D). No posterior fossae disorders were detected on brain MRI. An endoscopic surgical approach to the mucocele was performed and dizziness and diplopia disappeared 1 week after treatment.

►Fig. 2 displays three-step Parks–Bielschowsky test before and 1 week after surgery. After 1 year of follow-up, there was no recurrence of disease and the patient remained asymptomatic.

An informed consent has been signed by the patient, agreeing with the completion and dissemination of the findings and its results.

Discussion

Vertical strabismus is an important sign to detect in the neurotology practice but differential diagnosis between fourth nerve palsy and skew deviation may be challenging. While skew deviation may represent an initial manifestation of a life-threatening brain stem stroke, an acquired isolated forth nerve palsy rarely represents an emergency. Parks–Bielschowsky three-step test\(^1\)\(^2\)\(^3\)\(^4\) has been described to differentiate them, but major drawbacks have been described. A positive Parks–Bielschowsky test, with increased hypertropia in contralateral gaze and ipsilateral head-tilt, while suggesting fourth nerve palsy, can also be present in patients with skew deviation.\(^5\)\(^6\) Besides, the complete three-step test fails to detect 30% of superior oblique muscle palsy cases, suggesting that a combination of a positive first and third steps may be more helpful.\(^7\) The upright-supine test, highly specific in chronic findings,\(^8\) has been proved useless in the acute and subacute context.\(^9\) In this setting, indirect ophthalmoscopy can help differentiating the two conditions, by measuring the cyclotorsion of the hypertropic eye: typically, the hypertropic eye is excyclotorted in fourth nerve palsy and incyclotorted in skew deviation.\(^10\)

In the reported case, the right eye excyclotorsion and hypertropia, evident on alternate cover test, increased with right head-tilt. The patient presented with a spontaneous left
A maxillary fluid-filled mass may present with vertical strabismus and a positive Bielschowsky head-tilt test due to changes of the intraorbital component with head-tilt through a dehiscent orbital floor.