

Orbital floor fractures

- aspects of diagnostic methods, treatment and sequelae

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This thesis is based on the following papers:

- I. Folkestad L, Westin T.
Long-term sequelae after surgery for orbital floor fractures
Otolaryngology and Head & Neck Surgery 1999, vol 120, no 6, p 914-21
- II. Folkestad L, Granström G.
A prospective study of orbital fracture sequelae after change of surgical routines
J Oral Maxillofac Surg 2003, vol 61 : 1038-44
- III. Folkestad L, Åberg-Bengtsson L, Granström G.
Recovery from orbital floor fractures: a prospective study of patients' and doctors' experiences
Int J Oral MaxFac Surg 2006, available on line at www.sciencedirect.com
- IV. Folkestad L, Lindgren G, Möller C, Granström G
Diplopia in orbital fractures: a simple method to evaluate eye motility
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Abstract

Despite surgical intervention, orbital floor fractures are associated with risks of persisting sensibility disturbances, enophthalmos and diplopia. Cheek asymmetry and trismus may result when the zygoma is dislocated. In evaluating the surgical results patients' experiences of the outcomes have to be investigated.

To investigate sequelae a questionnaire was sent to 107 patients previously treated for an orbital floor fracture (Paper I). Visual analogue scales (VASs) were used in a prospective study (Papers II and III) to assess patients' experiences of persisting signs and symptoms. The possibility of using electronystagmography (ENG) equipment, normally employed in vestibular testing in ENT practice, for measuring bilateral vertical eye motility was investigated in a methodological study (Paper IV).

Fractures were mainly due to assaults and falls. Sequelae were common (83%). A high frequency of diplopia (36%) was associated with antral packing. When stable floor implants replaced this technique, the subsequent prospective study revealed absence of severe cases of diplopia as well as a lower occurrence of diplopia (9.5%).

Patients and doctors agreed on the presence of 'objective' signs (affected physical appearance and diplopia). Sensibility disturbances and reduced mouth opening capacity were not sufficiently reflected by the diagnostic assessment methods used, and these symptoms were underestimated by the clinicians.

Surgery of the internal orbit involves risks. For this reason, operations for purely diagnostic purposes must be avoided. However, 21% of the orbital floor operations in the present study were performed for purely diagnostic purposes. Surgeons did not apprehend the CT scans as being representative of the fracture. No test is at present available that can objectively establish entrapment of soft tissues as a cause of diplopia, although this is an absolute indication for surgery.

However, vertical electro-oculography (vEOG) was shown to (i) objectively measure vertical eye motility; (ii) detect and verify mechanical restriction of vertical eye motility; and (iii) distinguish patients experiencing vertical diplopia from healthy test subjects with 'normal' eye motility.

Both recognition of patients' experiences and prolonged follow-ups in selected cases are important for treatment feedback, and are prerequisites for improvement of future surgical outcomes. Current diagnostic methods appear to be insufficient. Vertical electro-oculography is suggested as a simple, objective and non-invasive eye motility test with the potential of helping predict which patients will benefit or not benefit from orbital floor surgery.

Key words: orbital floor fracture, sequelae, patients' experience, diplopia, entrapment, vertical eye motility, vertical electro-oculography (vEOG)