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Functional outcome after non-surgically management of orbital fractures – the bias of decision-making due to defect size: critical review of 48 patients

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The treatment of mild and moderate orbital wall fractures is controversially discussed in literature. Apart from clinical signs, defect size is an often used decision-making parameter to determine the therapeutic algorithm. Based on retrospective findings we hypothesized the presence of parameters with impact on position and motility of the globe but independent from defect size, preventing an unfavorable outcome of conservative treatment of mild and moderate orbital wall defects.

Between January 2000 and December 2007, 48 out of 127 patients were included in a retrospective study analyzing the functional outcome of non-surgically managed orbital fractures. Selection was dependent on the availability of complete clinical records, posttraumatic CT scans (axial and coronal sections) and ophthalmologic examination. All 48 defects were analyzed and allocated to the corresponding categories of a semi-quantitative classification. The fracture area of each defect was calculated with an integral calculus or geometrical formula and correlated to the associated class. Class A includes all orbital walls as a single unit (A1) as well as combined fracture patterns (A2 and higher). Class B categorizes isolated medial wall fractures. There was a statistically significant ($p<0.01$) correlation between classes (A1 and A2) and absolute fracture area ($0.98\pm0.4 cm^2$ and $2.42\pm0.8 cm^2$). Diplopia was most often seen in fractures of category B 1 (anterior third of medial wall) and posttraumatic globe position had a positive correlation ($p=0.044$) with fracture area. The degree of diplopia was less severe in fractures of the posterior portion of the orbit (zone 2 and 3) even if the defect size increased, compared with fractures of the anterior orbit.

The conservative management of orbital fractures class A1-3 and/or B1-3 up to 2.42 (3.15) cm^2 showed an outcome without functional impairment, provided that enophthalmos was less than 2 mm and there was no entrapment of periorbital tissue or extraocular muscles. In this study, a positive correlation between diplopia, eye motility, enophthalmos and fracture size has only been demonstrated for enopthalmos. We conclude that conservative management of an orbital fracture with defects up to 3 cm^2 has a very low risk for functional restrictions, when enophthalmos is less than 2 mm and entrapment of soft tissue or muscles is excluded. The defect size, however, seems to have less impact than localization indicating the importance of an intact musculofibrous ligament system as a supportive framework for the eye.