

Summary: Orbital floor fractures

This work aimed to assess the impact of the implant material, the size of the defect, and the type of fracture on postoperative complications of surgically treated base orbit fractures. The monitored complications were enophthalmos, diplopia, innervation disorders of the infraorbital nerve. A total of 67 patients with "pure" and "impure" orbital fractures were enrolled in this study. The patients were examined, indicated for surgery, and operated at the Dentistry Clinic of the University Hospital in Hradec Kralove at the Department of Oral, Maxillofacial and Facial Surgery between 2009 and 2020. The group of patients included 41 men and 26 women.

In the study, we compared several types of implant materials, i.e., 0.5 mm thick poly-p-dioxanone PDS foil (Ethicon, Johnson & Johnson, Germany), 0.4 mm thick titanium mesh (Synthes GmbH, Oberdorf, Switzerland), 1.5 mm thick Medpor (Porex Surgical Products Group, Newnan, USA), an individually made Toman column, and a Foley catheter balloon filled with saline.

This study showed that the use of titanium mesh for the reconstruction of the orbit base led to a higher incidence of innervation disorders in the infraorbital nerve area ($p=0.0245$), compared to the use of other implant materials. Furthermore, a difference in the incidence of enophthalmos 2 mm and more depending on the relative size of the orbital defect was detected. The occurrence of enophthalmos 2 mm and more was statistically significantly more frequent in patients with a defect of $53.1\pm 8.9\%$ of the orbital area than in patients with a smaller defect area. The difference was compared 6 months after the operation ($p<0,001$) and 1 year after the operation ($p<0,001$). The incidence of innervation disorder in the infraorbital nerve region was also dependent on the relative size of the orbital defect. Six months after the operation, the innervation disorder in the infraorbital nerve area was statistically significantly more frequent in patients with a defect of $43.5\pm 9.8\%$ of the orbital area than in patients with a smaller defect area ($p=0.0117$). One year after the operation, this complication was present statistically significantly more often in patients with a defect of $44.8\pm 10.8\%$ of the orbital area than in patients with a smaller defect area ($p=0.0078$).

In conclusion, the risk of postoperative complications, i.e., enophthalmos and innervation disorders of the infraorbital nerve, is increased in orbit base defects greater than 40% of its area.