Int. J. Oral Maxillofac. Surg. 2018; xxx: xxx–xxx
https://doi.org/10.1016/j.ijom.2018.04.004, available online at https://www.sciencedirect.com

International Journal of Oral & Maxillofacial Surgery

Case Report
Clinical Pathology

Combining midfacial degloving, LeFort-I osteotomy and inferiorly extended lateral orbitotomy (Krönlein) for removal of an orbital cavernous haemangioma: a new approach

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M. Schwaiger, J. Wallner, W. Zemann, M. Feichtinger: Combining midfacial degloving, LeFort-I osteotomy and inferiorly extended lateral orbitotomy (Krönlein) for removal of an orbital cavernous haemangioma: a new approach. Int. J. Oral Maxillofac. Surg. 2018; xxx: xxx–xxx.

Abstract. Orbital tumours, located in the medial extraconal and intraconal compartment of the orbit, represent a challenge, with regard to surgical exposure. In the present paper removal of a cavernous haemangioma, located in the medial intraconal compartment was accomplished by combining lateral orbitotomy, midfacial degloving and LeFort-I osteotomy. Resection of the tumour could be performed under direct vision. Surgical exposure and removal of the lesion were obtained, without causing damage to surrounding tissues. Aesthetical results and postoperative eye function proved to be highly satisfactorily. With regard to limitations, concerning the combination of these methods, extended surgery duration and invasiveness have to be named. According to the technical feasibility and postoperative results, this new surgical approach represents a reliable and fully viable alternative method for the removal of medial orbital tumours.

Key words: lateral orbitotomy; midfacial degloving; LeFort-I osteotomy; cavernous haemangioma.

Accepted for publication 9 April 2018

The orbit represents a complex anatomical unit. Despite the small size of this anatomical space, it is composed of a great diversity of different structures and tissues[1]. On grounds of the orbital structure alignment a subdivision into different orbital compartments was implemented. The muscle cone, comprising the four rectus muscles, delimits the intraconal from the extraconal compartment[1]. Intraorbital tumours may basically originate from any kind of orbital tissue. Consequently, intraconal and extraconal compartments are potentially affected. Corresponding to localization and size of the intraorbital

0901-5027/000001+07

Fig. 1. Preoperative photographs, showing a slight exophthalmos of the left eyeball, as well as an ocular motility disorder.

tumour, surgical removal can be challenging[2,3]. The difficulty of surgical exposure particularly concerns tumours located medially. This is due to the anatomical course of delicate structures, often substantially attached to the tumour, little space and poor visibility of the operating field[3]. Different surgical approaches were proposed for the removal of medial intra- and extraconal lesions. Among others, circumferential pan-orbitotomy, the transcaruncular approach and the vertical lid split orbitotomy are surgical methods worth considering, in relation to a medial tumour localization[3–5]. Additionally, endoscopic approaches have been elaborated recently[6]. Regarding the histologic origin of intraorbital tumours, great differences of incidence were observed. The orbital tumour most commonly occurring in adults is the cavernous haemangioma[7]. This benign vascular malformation is typically located intraconally, largely in the lateral sector[1]. In the present case, an unfavourable medial intraconal localization of a cavernous haemangioma was found. In this contribution, we present the combination of three different surgical approaches to ensure surgical exposure, clear intraoperative visibility and complete resection of the tumour. To the best of the authors' knowledge this surgical approach has not been described before.

Case report

A 60-year-old woman presented at the department of ophthalmology suffering from progressive diplopia for 2 months. Within the ophthalmic examination an ocular motility disorder and a slight exophthalmos of the left eyeball were diagnosed (Fig. 1). Subsequently, a magnetic resonance scan was performed, where an encapsulated, space-occupying lesion in the lower medial intraconal compartment of the left orbital cavity was detected. There was no infiltrating growth of the surrounding intraorbital tissue, though incarceration of the inferior rectus muscle and displacement of the optic nerve were found (Fig. 2). In synopsis of the radiological findings and clinical symptoms, a cavernous haemangioma was highly probable. By reason of progression of clinical symptoms, surgical removal was indicated.

Surgical procedure

Due to the unfavourable location of the tumour a combination of three surgical techniques was applied. Foremost, a modified, inferiorly extended lateral orbitotomy was performed: surgical access to the orbital rim was provided, applying the swinging eyelid approach. After sufficient layout of the operating field, ranging from the inferior orbital rim to the frontozygomatic suture, osteotomy lines were marked. Osteosynthesis materials were adapted and pre-drilled, prior to cutting the bone. Lateral osteotomy lines were set in conformity with the classic lateral orbitotomy. The inferior orbital rim was osteotomized medially of the exit point of the infraorbital nerve in the vertical direction. Additionally, a zygomatic osteotomy in vicinity of the zygomaticotemporal suture was performed (Fig. 3). Intermaxillary fixation with the aid of Schuchardt splints was implemented. Subsequently, midfacial degloving was initiated. Sublabial vestibular incision was chosen to expose the anterior maxilla. The nasal skeleton was dismantled from overlying soft tissue, connecting nasal transfixation incision, bilateral intercartilaginous incisions and bilateral circumvestibular incisions. The soft tissue was mobilized in an upward direction. By tunnelling the soft tissue on the left side, connection to the transconjunctival incision was established. The infraorbital nerve was neurolysed and preserved. The maxilla was osteotomized in a horizontal plane, in terms of a LeFort-I osteotomy. Vertical infraorbital osteotomy was finalized, connecting it to the horizontal maxillary osteotomy line. Again, adaption of osteosynthesis materials was carried out prior to performing the osteotomies. To ensure sufficient ac-

Please cite this article in press as: Schwaiger M, et al. Combining midfacial degloving, LeFort-I osteotomy and inferiorly extended lateral orbitotomy (Krönlein) for removal of an orbital cavernous haemangioma: a new approach, *Int J Oral Maxillofac Surg* (2018),