study aimed to evaluate the safety and accuracy of the endoscopic transethmoid-sphenoid approach for optic canal decompression. Twelve sides of 6 adult cadaveric heads fixed in formalin were selected to simulate optic canal decompression using the endoscopic transethmoid-sphenoid approach. Furthermore, this approach was used for optic canal decompression in 10 patients (11 eyes) with optic nerve canal injury. Related anatomical structures were observed using a 0-degree endoscope, and the anatomical characteristics as well as the surgical data were collected. The maximum effective widths of the cranial opening, orbital opening, and middle segment of the canal that could be drilled open endoscopically were 7.82±2.63, 8.05±2.77, and 6.92±2.01 mm, respectively. The angle between the line linking the center point of the tubercular recess with the midpoint of the cranial opening of the optic canal and the horizontal coordinate was 17.23±1.34 degrees. At the orbital opening of the optic canal, the ophthalmic artery was located directly inferior to the optic nerve in 2 cases (16.7%) and laterally inferior to the optic nerve in 10 cases (83.3%). Six of the operational eyes were effective while the remaining 5 were ineffective. No postoperative complications such as bleeding, infection, or cerebrospinal fluid leakage were observed during the follow-up period (6-12 mo). In conclusion, optic canal decompression positively impacts the prognosis of partial traumatic optic neuropathy. Furthermore, the endoscopic transethmoid-sphenoid approach for optic canal decompression is a minimally invasive procedure that provides direct access and adequate decompression. This technique is easy to master and suitable for clinical applications [1)].

Nasal and sphenoidal anatomies determine the feasibility and risks for doing an efficient medial optic or orbit decompression. • Techniques and tools used are those developed for pituitary surgery. • A middle turbinectomy and posterior ethmoidectomy are mandatory to expose the medial wall of the orbit. • The Onodi cell is a key marker for the optic canal and must be opened up with caution. • The lamina papyracea is opened first with a spatula and the optic canal opened up by a gentle drilling under continuous irrigation from distal to proximal. • Drilling might always be used under continuous irrigation to avoid overheating of the optic nerve. An ultrasonic device can be used as well. • The nasal corridor is narrow and instruments may hide the infrared neuronavigation probe. To overcome this issue, a magnetic device could be useful. • Doppler control could be useful to locate the ICA. • The optic canal must be opened up from the tuberculum of the sella to the orbital apex and from the planum (anterior cranial fossa) to the lateral OCR or ICA canal • At the end of the procedure, the optic nerve becomes frequently pulsatile, which is a good marker of decompression [2)].

The usual technique to decompress the canal is through a craniotomy, but recently endoscopic endonasal approaches (EEAs) have surfaced as an interesting alternative due to direct access to the canal without the need for manipulation of neurovascular structures.

Six specimens were dissected. The right optic canal was drilled on the right side via the EEA, and the left optic canal was drilled via frontotemporal craniotomy. The amount of decompression was measured using a 3-dimensional reconstruction on computed tomography scans and compared.

The EEA generated an average of 267.8 (221-294) degrees of decompression in the anterior portion of the canal versus 258.3 (219-300) degrees of decompression in the posterior portion of the canal, whereas the craniotomy generated an average of 229.3 (101-289) degrees of decompression in the anterior portion of the canal versus 250.3 (76-300) degrees of decompression in the posterior portion of the canal. There was no significant difference statistically.

The decision for an approach for optic canal decompression should be based on the site of the pathology and localization of canal involvement. Both techniques are equivalent in terms of the proportion of nerve decompression [3].

Hokazono et al. approached the right optic canal laterally from a coronal incision in front of the right ear, cutting along the border of the sphenoid bone, and scraping away some of the sphenoid wing and zygomatic bone. Steroid pulse therapy was added. Eventually, the visual acuity improved to 0.2 and the intraocular pressure decreased to 16.0 mm Hg. Compared with conventional methods, this method associates with better safety because (1) it causes relatively little bleeding and Cerebrospinal fluid fistula; (2) once the sphenozygomatic suture is identified, the distance to the optic canal is relatively short; and (3) if the fracture point is on the outer optic canal, the fracture line can be observed directly. Steroid pulse therapy may also have contributed to the good visual outcome. This is the first report of a novel lateral approach to OCF that is safe, effective, and only requires plastic surgery skills [4].

A review of available studies shows that the visual acuity of patients with TON can be significantly improved after OC decompression surgery (especially endoscopic transnasal transseptal optic canal decompression (ETOCD)) with or without the use of corticosteroids. And new findings of laboratory studies such as mitochondrial therapy, lipid change studies, and other studies in favor of TON therapy have also been identified [5].

VEP could be used as an important reference for preoperative and prognosis evaluation. Operative time after trauma is only a relative condition that may affect the therapeutic effect of optic canal decompression. Poor results of this procedure may be related to the severity of the optic nerve injury [6].

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