Trigeminal schwannoma case series

2023

Eleven patients with trigeminal schwannoma who were treated in the Department of Otorhinolaryngology, Qilu Hospital of Shandong University from December 2014 to August 2021 were analyzed retrospectively in this study. There were 7 males and 4 females, aged (47.5±13.5) years (range: 12 to 64 years). The neoplasm involved the pterygopalatine fossa, infratemporal fossa, ethmoidal sinus, sphenoid sinus, cavernous sinus, and middle cranial fossa. The size of tumors were between 1.6 cm×2.0 cm×2.0 cm and 5.7 cm×6.0 cm×6.0 cm. Under general anesthesia, the tumors were resected through the transpterygoid approach in 4 cases, through the prelacrimal recess approach in 4 cases, through the extended prelacrimal recess approach in 2 cases, and through the endoscopic medial maxillectomy approach in 1 case. The nasal endoscopy and imaging examination were conducted in 2 weeks, 3 months, 1 year and subsequent every year to detect whether neoplasm recurred or not, meanwhile, the main clinical symptoms were also closely observed during follow-up. Results: All the surgical procedures were performed under endonasal endoscope, including Gross total resection in 10 patients. The tumor of a 12-year-old patient was not resected completely due to huge tumor size and limited operation space. One patient was accompanied by two other schwannomas located in the occipital region and the ipsilateral parotid gland region originating from the zygomatic branch of the facial nerve, both of which were removed concurrently. After tumor resection, the dura mater of middle cranial fossa was directly exposed in the nasal sinus in 2 cases, including 1 case accompanied by cerebrospinal fluid leakage which was reconstructed by a free mucosal flap obtained from the middle turbinate, the other case was packed by the autologous fat to protect the dura mater. The operation time was 180 (160) minutes (range: 120 to 485 minutes). No complications and deaths were observed. No recurrence was observed in the 10 patients with total tumor resection during a 58 (68) months' (range: 10 to 90 months) follow-up. The symptoms No obvious change was observed in the facial appearance of all patients during the follow-up. Conclusion: Type D trigeminal schwannoma involving pterygopalatine fossa and infratemporal fossa can be removed safely through purely endoscopic endonasal approach by selecting the appropriate approach according to the size and involvement of the tumor. [1)]

2022

A retrospective analysis was performed on 32 patients with TS who underwent GKRS between May 1994 and December 2016. Clinical charts, radiographic results, and surgical records were reviewed. To evaluate whether symptoms improved after GKRS, patient demographics, GKRS profile, radiological tumor size change, and tumor location were analyzed.

Results: Tumor control after GKRS for symptomatic TS was 87%. The improvement rates for facial pain at 6, 12, and 24 months after GKRS were 46%, 72%, and 86%, respectively. For the same time intervals, facial hypesthesia improved by 12%, 46%, and 52%, respectively. Of the patients with diplopia, 17% had improved symptoms 12 months after GKRS, and 50% of the patients improved after 24 months.

GKRS can be an effective treatment modality for TS tumor control and shows favorable results in improving TS-related symptom, especially facial pain [2)].

2019

A retrospective multicenter analysis was performed on 25 patients who underwent endoscopic surgical treatment for trigeminal schwannomas between September 2011 and February 2019. Thirteen patients (52%) underwent EEA and 12 (48%) had endoscopic transorbital superior eyelid approach (ETOA), one of whom underwent a combined approach with retrosigmoid craniotomy. The extent of resection, clinical outcome, and surgical morbidity were analyzed to evaluate the feasibility and selection of surgical approach between EEA and ETOA based on predominant location of trigeminal schwannomas.

According to predominant tumor location, 9 patients (36%) had middle fossa tumors (Samii type A), 8 patients (32%) had dumbbell-shaped tumors located in the middle and posterior cranial fossae (Samii type C), and another 8 patients (32%) had extracranial tumors (Samii type D). Gross-total resection (GTR, n = 12) and near-total resection (NTR, n = 7) were achieved in 19 patients (76%). The GTR/NTR rates were 81.8% for ETOA and 69.2% for EEA. The GTR/NTR rates of ETOA and EEA according to the classifications were 100% and 50% for tumors confined to the middle cranial fossa, 75% and 33% for dumbbell-shaped tumors located in the middle and posterior cranial fossae, and 50% and 100% for extracranial tumors. There were no postoperative CSF leaks. The most common preoperative symptom was trigeminal sensory dysfunction, which improved in 15 of 21 patients (71.4%). Three patients experienced new postoperative complications such as vasospasm (n = 1), wound infection (n = 1), and medial gaze palsy (n = 1).

ETOA provides adequate access and resectability for trigeminal schwannomas limited in the middle fossa or dumbbell-shaped tumors located in the middle and posterior fossae, as does EEA for extracranial tumors. Tumors predominantly involving the posterior fossa still remain a challenge in endoscopic surgery [3)].

2014

A retrospective study of all patients with trigeminal schwannomas was performed with a focus on dumbbell tumors. Tumors were classified according to a modified Samii classification. Extent of tumor removal, outcome, and morbidity rates in the 2 subgroups were compared.

Twenty patients were enrolled: 8 had dumbbell-shaped tumors (type C1), 8 had middle fossa tumors (A1-3), 3 had extracranial extension (D2), and 1 had posterior fossa tumor. Gross total resection was achieved in 15 and near-total resection in 5 patients. In 4 patients with dumbbell tumors, the classic RISA (Samii approach) was used; EA-RISA was used in the other 4 patients. The extent of petrous apex drilling was determined individually on the basis of the anatomic variability of suprameatal tubercle and degree of tumor-induced petrous apex erosion; in 2 patients, only minimal drilling was needed. The endoscope was applied after microsurgical tumor removal and in 3 of 4 patients revealed a significant unrecognized tumor remnant in the anterolateral and superolateral aspects of the Meckel cave. Thus, the endoscope assisted retrosigmoid intradural suprameatal approach (EA-RISA) technique allowed gross total resection of the tumor.

The EA-RISA enlarges the exposure obtained with the classic RISA. Its judicious use can help achieve safe and radical removal of dumbbell-shaped trigeminal schwannomas (C1 type) [4)].

2008

From 1984 to 2006, of 23 patients with trigeminal schwannoma (10 males and 13 females, ages 14-77 years), 15 patients underwent combined transpetrosal extirpation, 5 patients underwent stereotactic radiation, and 3 were followed without intervention. Of the 15 who underwent surgery, total tumor removal was achieved in 9 patients. Cytoreductive surgery was performed in six patients; of these, four received postoperative radiation. One patient who underwent primary radiation therapy required subsequent surgery. There were no deaths in this series. Cranial neuropathies were present in 14 patients pretreatment and observed in 17 patients posttreatment. Major complications included meningitis (1), cerebrospinal fluid leakage (2), major venous occlusion (1), and temporal lobe infarction (1).

Trigeminal schwannomas are uncommon lesions of the skull base that may occur in the middle fossa, posterior fossa, or both. Moreover, caudal extension results in their presentation in the infratemporal fossa. Contemporary diagnostic imaging, coupled with selective use of both surgery and radiation will limit morbidity and allow for the safe and prudent management of this uncommon lesion [5].

1)
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