Trigone ventricular meningioma case series

2022

Three patients with meningiomas in the lateral ventricle trigone were treated by a novel intraoperative method of PIP just after tumor removal to prevent ETH. Silicone catheters normally used as ventricular drainage catheters were cut to 5- to 6-cm length and inserted into the tumor cavity to ensure communication between the temporal horn and the atrium or the body of the lateral ventricle through the piping straddling the trigone.

Results: None of our patients developed ETH during the follow-up period without complications caused by the tube placement.

Conclusions: PIP might be beneficial to prevent ETH because constant osmotic pressure and constant cerebrospinal fluid pulse wave transmission are maintained between each compartment of the lateral ventricle [1)].

Daza-Ovalle et al. retrospectively reviewed the GKRS database identifying 2501 meningiomas treated at the University of Pittsburgh Medical Center over the last 35 years. Nineteen patients with (12 males, mean age = 53.2 years, range 14-84) 20 IVMs were identified. Headache was the most frequent presenting symptom (N = 12), and the trigone of the lateral ventricle was the most common location (N = 18). GKRS is an effective and safe management option for intraventricular meningiomas. Early GKRS should be considered as a primary management modality for small and medium sized IVM and adjuvant management for residual IVMs. [2)].

The clinical features of 64 patients with LVTMs were analyzed. Age, gender, body mass index, medical history, intraoperative blood loss (IBL), intraventricular drainage placement, surgical duration, tumor grade, postoperative tumor cavity hemorrhage, and tumor size were included in univariate and multivariate analyses of POM.

Results: Of the 64 patients, 14 patients (21.9%) received a diagnosis of POM. The univariate analysis revealed IBL ≥400 mL (odds ratio [OR], 9.012; $p = 0.003$), tumor size ≥50 cm3 (OR, 3.071; $p = 0.080$), and surgical duration ≥5 h (OR, 2.970; $p = 0.085$) were considered possible risk factors for POM ($p < 0.10$). Tumor size ($R = 0.514$) and surgical duration ($R = 0.624$) were significantly correlated with IBL ($p < 0.05$). In the multivariate analysis, only IBL was found to be an independent risk factor for POM.

The IBL ≥400 mL is independently associated with the increased risk of POM in LVTM patients. Our results demonstrate the importance of controlling IBL for preventing POM, especially in large tumors and long surgeries [3)].

Thirty patients with trigone meningiomas were enrolled in this retrospective study. Conventional MRI was performed in all patients; SWI (17 cases), dynamic contrast-enhanced PWI (10 cases), and

dynamic susceptibility contrast PWI (6 cases) were performed. Demographics, conventional MRI features, SWI- and PWI-derived parameters were compared between different grades of trigone meningiomas.

On conventional MRI, the irregularity of tumor shape (ρ = 0.497, P = 0.005) and the extent of peritumoral edema (ρ = 0.187, P = 0.022) might help distinguish low-grade and high-grade trigone meningiomas. On multiparametric functional MRI, rTTPmax (1.17 ± 0.06 vs 1.30 ± 0.05, P = 0.048), Kep, Ve, and iAUC demonstrated their potentiality to predict World Health Organization grades I, II, and III trigone meningiomas.

Conventional MRI combined with dynamic susceptibility contrast and dynamic contrast-enhanced can help predict the World Health Organization grade of trigone meningiomas [4].

2021

Schwartz et al. retrospectively assessed 27 neurosurgically treated patients (median age 63 years, range 15-84) between 1999 and 2019. The median preoperative Karnofsky Performance Scale (KPS) was 80 (range 20-100), and the majority (78%) suffered from tumor-specific symptoms. The most frequent symptoms were aphasia (n = 6), visual field deficits (n = 5), and increased intracranial pressure (n = 5). The median tumor volume was 11.2 cm3 (range 3.9-220.5). The most common approaches were the transtemporal (n = 17) and transparietal routes (n = 5).

At the last follow-up (median follow-up 35 months, range 3-127), the median KPS was 90 (range 30-100); eleven (42%) patients had improved, nine (35%) were unchanged, six (23%) had worsened, and one was lost to follow-up. One year after surgery, 18/21 (86%) patients had retained an activity level similar to or improved compared with preoperatively. No surgery-related mortality was recorded. Postoperative new neurological deficits were seen in 13 (48%) patients; eight suffered from permanent, most commonly motor deficits (n = 4), and five from transient deficits. Permanent new motor deficits improved in the majority of affected patients (3/4) over time. New deficits were more often seen for transtemporal (8/17) than transparietal approaches (1/5). Patients with postoperative permanent new deficits had a significantly worse KPS at last follow-up (p < 0.001).

The transtemporal and transparietal approaches provide good access, but the latter might provide a better risk profile. Patients show favorable outcomes, but there is a considerable risk of new neurological deficits. This must be taken into consideration for oligosymptomatic patients [5].

2020

A total of 110 cases were included in the analysis. Thirteen (11.8%) cases developed dTTH following surgery. Multivariable logistic regression demonstrated an association of longer operative duration with higher incidence of dTTH (OR, 1.34; 95% CI, 1.00-1.80; p = 0.049). As surgical duration prolonged from less than 3 hours to 5 hours or more, the incidence of dTTH increased in a consistent, linear fashion from 7.7% to 13.9% (p = 0.03). Six cases (46.2%, 6/13) of dTTH underwent surgical treatment for their life-threatening symptoms. Seven studies including 13 cases of dTTH in the literature were identified. Literature data, including the current series, revealed a total of 24 procedures were performed in 19 cases. Endoscopic fenestration trended toward fewer complications

than shunt (7.7% vs 25.0%, p = 0.530). There were no significant differences in failure rates between the two groups (23.1% vs 25.0%, p = 1.000).

Conclusion: Patients with prolonged operative duration may be at higher risk of dTTH. Endoscopic fenestration is considered in preference to shunt placement, since it possesses equivalent success rates with fewer complications and avoids the need for a permanent implant [6].

2019

Lin et al. retrospectively reviewed the clinical data for 19 consecutive cases of TTH that developed after microsurgical resection of lateral ventricular trigone meningioma between 2011 and 2015.

Results: The 19 cases involved 6 male and 13 female patients (mean age [± SD] 39.9 ± 13.8 years). The mean time interval from tumor resection to the onset of TTH was 3.2 ± 3.0 months (range 3 days-10 months). Symptoms of intracranial hypertension were the most common complaints at presentation. The mean Karnofsky Performance Scale (KPS) score at onset was 52.1 ± 33.3 (range 10-90). Midline shift was observed in 15 cases (78.9%), and the mean amount of midline shift was 6.0 ± 4.8 mm (range 0-15 mm). Eleven cases (57.9%) were managed with surgical intervention, while 8 cases (42.1%) were managed conservatively. All patients (100%) showed improved clinical status over the course of 4.8 ± 1.0 years (range 2.8-6.3 years) of follow-up. The mean KPS score at the last follow-up was 87.9 ± 11.3 (range 60-100). Eighteen patients (94.7%) showed signs of radiographic improvement, and 1 patient (5.3%) exhibited stable size of the temporal horn. Significant differences were observed between the surgical and nonsurgical cohorts for the following variables: KPS score at onset, presence of intracranial hypertension, and midline shift. The mean KPS score at onset was greater (better) in the nonsurgical group than in the surgical group (82.5 ± 8.9 vs 30 ± 25.7, p = 0.001). A greater proportion of patients in the surgical group presented with symptoms of intracranial hypertension (81.8% vs 0%, p = 0.001). The extent of midline shift was greater in the surgical group than in the nonsurgical group (9.0 ± 3.8 mm vs 2.0 ± 2.4 mm, p = 0.001).

The majority of patients with TTH presented in a delayed fashion. TTH is not always a surgical entity. Spontaneous resolution of TTH may be under-reported. Conservative management with clinical and radiological follow-up is effective in selected patients [7].

Eight women and seven men (mean age 52) with 15 trigone IVMs were retrospectively analysed. Patients presented with headache (47%), psychoorganic syndrome (40%), hemianopsia (33%) or paresis (20%), including three (20%) patients with Karnofsky Performance Scale (KPS) < 80. Mean tumour size was 55.2 mm (range: 30-100 mm).

Results: Gross total tumour resection was performed in 14 (93%) cases, and subtotal in one (7%). A new deficit appeared in 83% (5/6) following a transparietal approach, in 14% (1/7) following a transtemporal approach, and in none of two patients following a transoccipital approach. Postoperative complications occurred in six (40%) patients; no patient died, but in two (13%) the new deficit was permanent. Tumour re-growth was found in two (13%) patients after 14 and 31 months. Meningiomas of WHO grade I occurred in 12, grade II in three, and grade III in one tumour recurrence. In long-term follow-up (mean: 60.8 months), including the results of revision operations, KPS: 80-100 was in 13 (87%) patients, KPS: 50 in one (severe hemiparesis after revision) and one patient was lost to follow-up (KPS: 100 on discharge).

20% of IVMs in our series were atypical. The results of surgery for IVMs, although satisfactory in general, require further improvement by reducing the rate of focal deficits resulting from a surgical approach [8)]

2018

Kim et al., from the Chonnam National University Hwasun Hospital, South Korea, report the surgical outcome of trigonal intraventricular meningiomas through three different approaches with attention to visual outcomes.

Between 1994 and 2017, twenty-three patients underwent resection of trigonal meningiomas.

They performed tumor removal using three different surgical approaches through the superior parietal lobule, middle temporal gyrus (MTG), and modified-MTG. The patients were retrospectively identified and surgical results including visual outcome were analyzed.

Twenty three patients with a mean age of 45 years formed the study group. The most common symptom and sign were headache (N=14, 60.9%) and visual disturbance (N=6, 26.1%). All patients underwent surgical resection, 6 via trans-lateral approach through MTG, 8 via trans-lateral approach through modified MTG, and 9 via trans-parietal approach through superior parietal lobule (SPL). Gross total resection was achieved in all patients.

They found that visual preservation rate was 25% (1/4) in the MTG group, 62.5% (5/8) in the modified MTG group, and 100% (7/7) in the SPL group, respectively (p=0.044). Permanent complication rate was 50% (3/6) in the MTG group, 50% (n=4/8) in the modified MTG group, and 11.1% (n=1/9) in the SPL group.

The superior parietal lobule approach is a safe and applicable procedure with a great visual preservation and an acceptable risk of morbidity for trigonal meningiomas, when there is a chance of visual recovery or preservation [9)].

2015

Between 2009 and 2012, four patients underwent microsurgical resection in our department. Clinical and imaging findings, surgical approaches, outcomes, and follow-up were analyzed.

Four patients (three females and one male) were included and the signs of intracranial hypertension were the main clinical presentation in all cases. The parietal approach through intraparietal sulcus was performed in 3 cases and parieto-occipital interhemispheric surgical route in 1 case. Gross total resection was achieved in all the patients without additional deficits and without the aid of neuronavigation, intraoperative monitoring, and intraoperative magnetic resonance imaging.

Gross total resection is the gold standard treatment for such tumors and the intraparietal sulcus approach is an excellent choice for most of the cases. Careful anatomical knowledge contributes to a safer procedure even in the absence of high tech equipment assistance [10)].

2011

From 1989 to 2006, six patients with meningiomas of the trigone of the lateral ventricles underwent microsurgical resection. Their clinical features, image, follow up, and surgical approaches were retrospectively analyzed.

Results: Five patients presented with large and one with small volume meningioma. Unspecific symptoms occurred in three patients; intracranial hypertension detected in three patients; homonymous hemianopsy in three; and motor deficit present in one patient. Three patients were operated by transparietal transcortical approach, two by middle temporal gyrus approach, and one by parieto-occipital interhemispheric precuneus approach. Total resection was achieved in all patients without additional deficits.

Conclusion: Judicious preoperative plan, adequate knowledge of anatomy, and use of correct microsurgical techniques are fundamental in achieving complete resection of trigone meningioma with low morbidity [11].

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