Clinical Results of the Superior Parieto-Occipital Transcortical Approach for Intraventricular Meningiomas in the Trigone of Lateral Ventricle; A Report of 24 Cases

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ABSTRACT

Introduction: Intraventricular meningiomas are uncommon subtype of intracranial meningiomas. Trigonal meningiomas consist of the majority of intraventricular meningiomas. The superior parieto-occipital transcortical approach is the most popular approach for removal of them. We analyzed our experience in removal of the trigonal meningiomas that were resected using the superior parieto-occipital transcortical approach.

Patients and Methods: Twenty-four patients underwent surgical removal of trigonal meningioma from 1997 to May 2012. Demographics, clinical features, surgical outcomes, histopathologic results and prognosis were analyzed.

Results: Study population had a mean age of 51.2 years and a female preponderance of 1:1.7. The most common presenting symptom was chronic headache, which was followed by memory impairment, visual disturbance and hemiparesis. Total removal of the tumor was achieved in all cases. Twenty-two (91.7%) tumors were World Health Organization (WHO) grade I while two cases were WHO grade III. There were two cases of intracerebral hemorrhage in the surgical corridor, one case of transient contralateral hemiparesis with cognitive decline, one case of transient contralateral homonymous hemianopsia, one case of aggravation of visual field defect, and one case of hydrocephalus which was successfully treated by ventriculo-peritoneal shunt.

Conclusion: The superior parieto-occipital approach is suitable for most of the trigonal meningiomas and total removal of them can be achieved safely.

KEY WORDS: Intraventricular meningioma · Surgical approach · Trigone · Atrium · Superior parieto-occipital · Posterior transcortical.
can be classified according to the location, and the trigone of lateral ventricle is the most common site.\textsuperscript{5,6,7,9,12,13}

Unique features of the trigonal meningiomas are absence of dural attachment and an attachment to the choroid plexus.\textsuperscript{5,10} Due to their location, surgical removal inevitably ends up in violation of adjacent neural structures including eloquent cerebral cortexes.\textsuperscript{3,16} In order to minimize neurologic complications, several surgical approaches have been introduced.\textsuperscript{4,8,9}

In this era of microsurgery and image-guided surgery, the superior parieto-occipital transcortical approach, also known as the posterior transcortical approach or the superior parietal lobular approach, is the most popular approach for removal of the trigonal meningiomas.\textsuperscript{10,11}

In this study, we retrospectively analyzed our recent clinical data of 24 trigonal meningiomas which were resected using the superior parieto-occipital transcortical approach.

\section*{Patients and Methods}

\subsection*{1. Study population}

From 1997 to May 2012, 24 patients underwent surgical removal of the trigonal meningioma at the department of Neurosurgery in Severance hospital. Their medical records including operative records and follow-up data, image studies and histopathologic results were analyzed retrospectively. All of 24 trigonal meningiomas were resected using the superior parieto-occipital transcortical approach.

\subsection*{2. Operative procedure}

The patient was in the supine position with the head rotated to the contralateral side. Inverted-U shaped skin incision was made over parieto-occipital area and craniotomy was done under assistance of an intraoperative image-guided navigation system. Cortical incision was made at the parieto-media surface one to two centimeters posterior to postcentral sulcus in the direction parallel to the long axis of superior parietal lobule. After visualization of tumor, an ultrasonic aspirator was used for internal decompression. Tumor was resected in en bloc fashion after devascularization. A ventricular drainage catheter was placed and maintained for 2–5 days after the operation in most of cases.

\section*{Results}

\subsection*{1. Demographics and clinical features}

There were 9 male patients and 15 female patients whose ages were ranged between 29 and 75 years old with an average of 51.2 years old. There was left-side preference of lesion and the left-to-right ratio was 1.7.

The most common symptom was chronic headache which was reported by 14 of 24 patients. Six patients suffered from memory impairment, and visual disturbance was seen in four patients. All of four patients with visual disturbance were appeared to have contralateral homonymous hemianopsia on the examination. One patient presented with mild right hemiparesis which affected lower extremity more. Mean length of time from the first symptom onset to the definite diagnosis was 9.4 months ranging from one to 26 months. In three patients, the tumor was detected incidentally during either health check-up or evaluation for mild head trauma. We decided to remove the tumor considering high likelihood of clinical deterioration, which was inferred from the perilesional edema and the infringing mass effect of the lesion.

Grossly total removal of the tumor was achieved in all cases. After the surgery, we followed up the patients from one month to 12 years, with a median duration of 29.2 months. Demographics and clinical features are summarized in Table 1.

\subsection*{2. Surgical morbidity and neurologic outcome}

There was no surgical mortality in this series. Intracerebral hemorrhage along the surgical corridor occurred in two cases. This was considered to be a traction injury rather than infarct-hemorrhage from a vessel injury as vascular territory could not be matched to the location of hematoma. The lesion was located in the dominant hemisphere in both cases and the patients had difficulty in naming and recalling. Their verbal fluency and cognitive function were declined. These conditions were completely resolved during the hospital stay in one case, and the speech impairment lingered, although improved, till one year after the operation in the other case.

\begin{table}[h]
\centering
\caption{Demographics and clinical features}
\begin{tabular}{|l|l|}
\hline
\textbf{Mean age} & 51.2 (23–75) \\
\hline
\textbf{Sex ratio (male : female)} & 9 : 15 (1 : 1.7) \\
\hline
\textbf{Lesion side ratio (right : left)} & 9 : 15 (1 : 1.7) \\
\hline
\textbf{Presenting symptoms} & \\
\hline
\textbf{Chronic headache} & 14 (58.3\%) \\
\hline
\textbf{Memory impairment} & 6 (25.0\%) \\
\hline
\textbf{Visual disturbance} & 4 (16.7\%) \\
\hline
\textbf{Contralateral hemiparesis} & 1 (4.2\%) \\
\hline
\textbf{Incidental} & 3 (12.5\%) \\
\hline
\textbf{Mean length of time to diagnosis (months)} & 9.4 (1–26) \\
\hline
\textbf{Median follow-up duration (months)} & 29.2 (1–144) \\
\hline
\end{tabular}
\end{table}