Intracranial meningiomas: Two-years experience of Mustafa Kemal University

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ABSTRACT

Meningiomas are the most common type of brain tumors. We have analyzed clinical, radiological and pathological characteristics of meningiomas that were diagnosed and operated in our centre. Twenty three meningioma cases operated in our hospital between 2010-2012 were reviewed retrospectively. Sixteen (69.1%) of cases were female and 7 (30.9%) of cases were male. The age range was 22-75. The most common symptoms of patients were headache, seizure, nausea and vomiting. Localizations of tumors were falx, cortex, sphenoid wing, posterior fossa-tentorium, olphactor, and sulcus. The surgical sizes were graded according to Simpson classification and 16 (69.1%) of cases were Grade 2 and 7 (30.9%) of cases were Grade I. At the histopathological examination; meningotheliomatous type was the most common type followed by fibrous, angiomatous, transitional, psammomatous and atypical types. Meningiomas are usually benign tumors with good prognosis which are often encountered in daily pathology and neurosurgery practice.

Keywords:
Clinic
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Meningioma
Pathology

1. Introduction

Meningiomas are one of the most common type of brain tumors constituting about 25% of all adult primary intracranial tumors (Claus et al., 2005). These tumors originates from arachnoid cap cells and frequently occurs in 5th-6th decade and over with slight female predominance (Greenberg, 2001). The etiology of meningiomas remains unclear, but ionizing radiation, brain injury, smoking, chronic viral infection, chromosomal abnormalities were proposed to be predisposing factors (Phillips et al., 2005). Meningiomas are generally benign and slow-growing tumors with less aggressive behaviour (Ragel and Jensen, 2005). In this study the clinical, pathological characteristics and localizations of meningioma cases in our center at 2010-2012 have been analyzed.

2. Materials and methods

We retrospectively reviewed records of the 23 patients operated and diagnosed as intracranial meningiomas in our center between 2010-2012. Patients files, pathology reports, radiological scans and surgical notes were reviewed and post-operative status of patients were recorded. Symptoms, clinical findings of patients and localizations of lesions were determined.

3. Results

Sixteen (69.1%) of cases were female and 7 (30.9%) of cases were male. The age range was 22-75. The average age was determined as 55.8±15.07. The patients referred to neurosurgery outpatient clinic due to headache (n:13, 56.5%), seizure (n:2, 8.7%), nausea and vomiting (n:2, 8.7%), behavioral and cognitive changes (n:2, 8.7%), hemiplegy (n:2, 8.7%), visual changes (n:1, 4.35%), hearing loss (n:1, 4.35%) (Table 1). Radiologic localizations of tumors were falx (n:7, 30.4%), corteks (n:6, 26.1%), sphenoid wing (n:5, 21.7%), posterior fossa-tentorium (n:3, 13.1%), and olphactory sulcus (n:2, 8.7%) (Table 2). The surgical sizes were graded according to Simpson classification and 16 (69.1%) of cases were Grade II and 7 (30.9%) of cases were Grade I. At the histopathological examination; meningotheliomatous type was the most common type followed by fibrous, angiomatous, transitional, psammomatous and atypical types. Meningiomas are usually benign tumors with good prognosis which are often encountered in daily pathology and neurosurgery practice.
had no symptoms afterwards. Meningotheliomatous type (n:10, 43.4%) is the most common type followed by fibrous (n:5, 21.7%) (Fig. 3), angiomatous (n:4, 17.4%) (Fig. 4), transitional (n:2, 8.7%), psammomatous (n:1, 4.3%), and atypical (n:1, 4.3%) types.

4. Discussion
Intracranial meningiomas are primarily benign tumors with 5 year-survival rates of 72% in females and 66% in males (McCarthy et al., 1998; Claus et al., 2005). The optimum age range of meningioma in adults is 40-60 and there is a female predominance (Greenberg, 2001). Our cases’ age range was wide differing from 22 to 75, but mean age was 55.8±50 years and a slight female predominance of 69% was obtained similar with the literature (Greenberg, 2001; Yilmaz, et al., 2012). Moon et al. (2012), evaluated prognostic factors of WHO Grade II meningiomas and found out that the patients had a median age of 48.4 years and similar to our study group there has been slight female predominance with 29/26: Female/male in their series. In a study conducted by Mahmood et al. (1993), typical and malignant meningiomas were observed in males more often than females. Meningioma etiology still

Fig. 1(a-b). MRI of the patient with parasagittal falx meningioma preoperatively (a) and at 1-month follow-up (b)

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Table 1. Distribution of patients’ symptoms

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Number(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>13</td>
<td>56.5</td>
</tr>
<tr>
<td>Seizure</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Nausea and vomiting</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Behavioral and cognitive changes</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Hemiplegy</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Visual changes</td>
<td>1</td>
<td>4.35</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>1</td>
<td>4.35</td>
</tr>
</tbody>
</table>

Fig. 2(a-b). (a): MRI brain (gado) axial (plain) section shows anterior parasagittal falx meningioma (b): Post-operative CT shows totally removed
remains elusive but female predominance suggests a role for hormonally mediated risk factors (Claus et al., 2012). Trauma, ionizing radiation, brain injury, smoking, chronic viral infection, chromosomal abnormalities are proposed to be other predisposing factors (Phillips et al., 2005; Nakasu et al., 2009). We could not demonstrate specific etiological agents in our cases which could be related to the minority of our study group. Symptoms of meningiomas vary due to the localization of tumoral mass and compression of brain which can affect cranial nerves and blood vessels. Patients referred to neurosurgeon mostly with headache, seizures, nausea and vomiting, visual changes and sometimes visible changes produced by the tumor extending into the bones of head and face (Alexiou et al., 2010). Similar to the literature headache has been the most common symptom followed by seizure and other symptoms in our cases. Ninety percent of meningiomas located supratentorial. Parasagittal region, convexity and falx were described to be the favourite regions of these tumors (Chan et al., 1984; Tuna et al., 1999). Radiologic localizations of tumors were mostly falx and cortex, sphenoid wing, posterior fossa-tentorium and olphactor sulcus were less frequent in our series. Different from our study Yılmaz et al. (2012), stated sphenoid wings as the most common localization of meningiomas in their series.

Meningiomas are 25% isodense and 75% slightly hyperintense on non-contrast Computed Tomography (CT). Calcification and edema may be present in up-to 10-25% cases with different forms. Homogenous dense enhancement is generally observed with contrast media administration. On magnetic resonance imaging typical meningiomas are usually isointense (60-65%), or hypointense (30-35%) relative to brain (Ginsberg, 1996). After administration of contrast, an enhancing “dural tail” which reflects neoplastic dural infiltration or reactive vascularity, or both, draining into the adjacent dura is specific sign for meningiomas. CT is more widely available for rapid screening in urgent settings, and can be used when patients have magnetic resonance imaging (MRI) exclusions (such as pacemakers). Conventional angiography is most often performed for preoperative endovascular embolization and is intended to reduce intraoperative complications (Saloner et al., 2010).

Meningiomas comprise one of the most encountered intracranial tumors with different histopathological variants. Almost all (96%) of meningiomas are typical meningiomas; meningotheliomatous type being the commonest (Rohinger et al., 1989; Torres et al., 1996). Similar with the literature meningotheliomatous type has been the most common type in our study too, followed by fibrous, angiomatous, transitional, psammomatous and atypical types. Twenty two (95.6%) of our cases were Grade I while 1 (4.3%) case was Grade II. Karabaglı et al. (2004) also stated Grade I meningiomas were more frequent than Grade II meningiomas in their series. Surgical excision is the available treatment in the current literature on meningiomas. There are five grades for surgical excision according to Simpsons classification system (Simpson, 1957). This surgical grading system has become a consensus for the excision of meningiomas. Sixteen (69.1%) of our cases were Grade II and 7 (30.9%) of cases were Grade I. Radical surgical excisions planned by the Simpson grading system reduces the recurrence rates. One of our patients had radiotherapy due to the residual tumor and had no symptoms afterwards. Stereotactic and external beam radiotherapy offers another option in irresectable meningiomas. Peptide receptor radionuclide therapy and hormonal therapies have been used as alternative approaches in advanced cases (Flickinger et al., 2003; Wolfsberger et al., 2004). There are some studies suggesting non-toxic somatostatin analogues might treat recurrent meningiomas (Chamberlain et al., 2007).

In conclusion; our data of last two years demonstrating meningiomas in our clinic are similar with the literature findings. Our goal is to perform more effective diagnostic and therapeutic approaches concomittant with scientific novelties in our hospital evoking new research.
REFERENCES


