

Imaging in Detection of Meningiomas of the Basis Crani Anterior

Serbeze Kabashi, Sefedin Muçaj, Sanije Gashi, Antigona Hasani, Ilir Ahmetgjekaj, Shemsedin Dreshaj, Nexhmedin Shala, H. Maloku, N. Haliti
Department of Radiology, University Clinical Centre of Kosova, Prishtina, Republic of Kosova

Original paper

SUMMARY

Meningiomas are slow growing tumors, with a huge substructure in dura mater, which constitute from neoplastic meningothelial cells. Computed tomography (CT) is the basic technique for evaluating the pathological processes in the brain. While, magnetic resonance imaging (MRI) is the most effective technique for the evaluation of brain structures and their pathologies. This study presents the effectiveness of CT and MRI in imaging the development of meningiomas of the basis crani anterior during 2005-2008 year period in UCKK, in Prishtina, as well as the importance of CT and MRI in their diagnostics. From a total number of 27 cases of meningeomas, 8 cases were meningiomas of basis crani anterior, out of which 1 case was olfactory meningioma, 4 cases were sphenoidal and 3 cases were suprasellar meningiomas. It is observed that female sex dominates in relation with male sex (66.7%). The highest percentage of meningiomas was found at the group age 51–60 (48.1%). CT and MRI enable a correct diagnosis of basis crani meningiomas in most of cases, but are impossible to predict the patients' outcomes.

Key words: meningioma, computed tomography, magnetic resonance imaging

1. INTRODUCTION

Meningiomas are usually slow-growing (benign) tumors that develop from the meninges. They are nonglial (extraaxial) tumors consist of 20-25% intracranial tumors, which are among the most frequent ones. Majority of meningeomas are benign and are classified in I grade according to the WHO grade. Some of the histological subtypes have not a very good prognosis and they belong to the WHO II and WHO III grade. They are shown in two classic forms as a round mass or as a plate (en-plaque), which in 90.0% is emphasized, in uni-formed mode (1,2,3,4).

In 20-25% of cases calcifications are present. There are tumors that are completely calcificated (psammomatous meningioma), accompanied with bone change in form of hyperostosis or erosion. 60% of meningeomas is accompanied with peritumoral edema. These are well vascularised tumors therefore they are well enhanced after the I.V. contrast (5,6).

A part of the tumors remain undiagnosed because they show no clinical symptoms, however there are cases, where a part is diagnosed accidentally during CT or MRI examinations. The major part of the tumors is diagnosed after clinical symptoms. They possess well determined localism, according to the incidents, they occur in cranial convexity, parasagittal, sphenoidal, pontocerebellar angle, suprasellar, fossa olfactory, cerebellar convexity, parasellar, clivus, tentorium, ventral lateral, foramen magnum, pineal region, optic nerves and ex-

tracranial (nose, sinus, cranial bone).

The tumor mass in CT and MRI examinations are shown in two different forms: as a round mass or outspread as a plate (en plaque). Without intravenous contrast, the mass occurs as a well limited round mass, extraaxial, which shift the brain to the opposite side. The tumor mass is usually homogeneous, hyperdense, contains Ca^{++} deposits (20-25%), and calcificated tumors are present (Meningioma psammomatous). Edema is present in 60% of meningioma, which is linked to the toxic effect of tumor, with the compromise of venous drainage and the speed of tumor increase. In the examination of intravenous contrast the well vascularized tumor, in 90% of cases, is emphasized uniformly. The mass is usually homogeneous, hyperdense, and rare small hypodense zones are present. Besides the intracranial mass, osseous modifications in the form of hyperostosis or erosions are evident. In MRI, meningioma is well differentiated from the brain tissues, where there is a small amount of cerebrospinal liquor between them. In T1, they represent isodense or hyperdense compared to brain cortex. MRI is important in detecting small meningeomas that have the same density as the brain cortex, and the flat plaque, too. In some cases, tumor mass shows emphasis and thickness of dura (dural tail), the presence of this image serves for a secure diagnose of meningeomas. Some authors interpret dural tail as a reaction; some others interpret it as an extension of tumor (1,7,8)

2. MATERIALS AND METHODS

We retrospectively studied evolution of basis crani anterior meningiomas during 2007- 2008 at University Clinical Center in Prishtina and the importance of fast and proper diagnosis of CT and MRI.

The study includes all patients of ages 12-75 years old, of both genders, who were deferred to radiological examinations in our clinic during this period. The age, gender, and the location of meningeomas in patients were examined. The medical records, surgical records, imaging studies, and histological diagnosis were analyzed. The study comprises only the meningiomas of the basis anterior cranial (M-

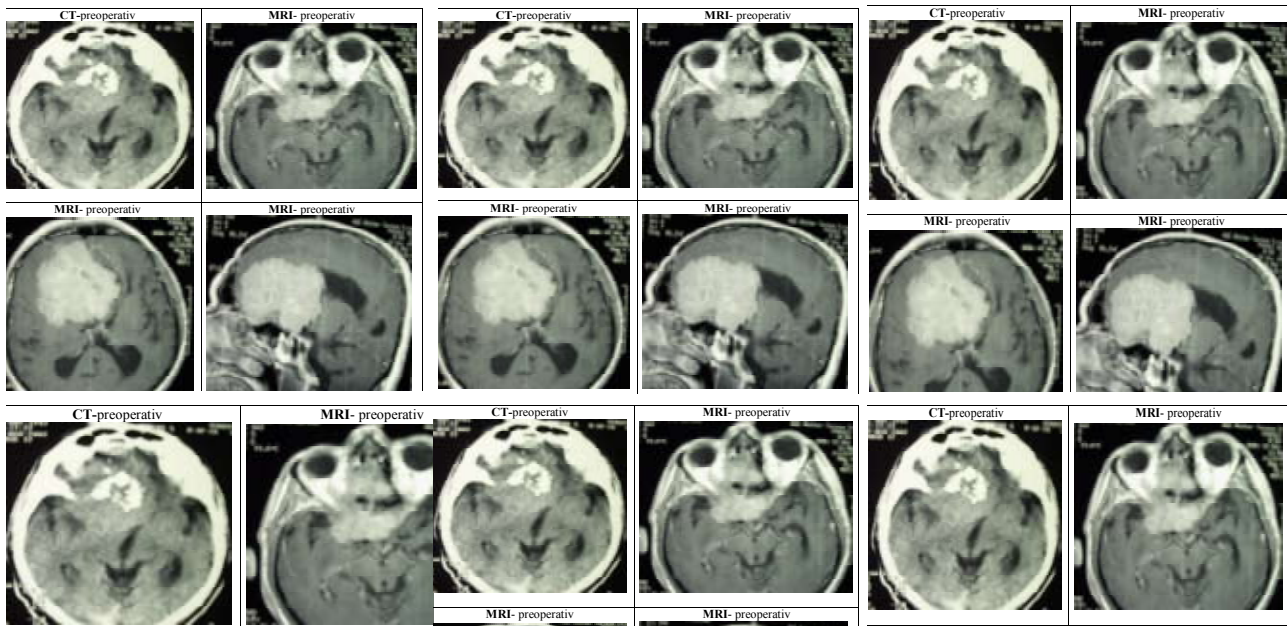


FIGURE 1. Samples of RMI picture of our tested patients

BCA), which contain olfactory meningiomas, sphenoidale meningioma, and suprasellar meningioma.

Statistical analysis of results was performed by using the InStat 3 programme. The measured statistical parameters were index structure, arithmetic mean and standard deviation. Nonparametric data including age and sex were compared by using χ^2 -test. All tests were considered significant if $P < 0.05$.

3. RESULTS

In Table 1 demonstrates the total number of meningiomas during period 2005-2008. The leading number of meningiomas was registered during year 2007, with 9 cases (33.3%), however the smallest number was recorded during year 2008 with 5 cases (18.5%).

The increased rate of morbidity was recorded during year 2007, with 0.43:100000 populations, the reduced rate was evident during year 2008 with 0.24:100000 populations.

During the period 2005-2008, from the total number of meningiomas, 8 cases were detected as basis crani anterior meningiomas. The largest number of these meningiomas were detected during year 2007, 3 cases (37.5%), and only 1 case (12.5%) during

TABLE 1. Incidence and morbidity rate of meningiomas during the years

Years	Total number of Meningiomas		Meningioma of the basis crani anterior	
	N (%)	Mb/ 100000	N (%)	Mb/ 100000
2005	6 (22.2)	0.29	1 (12.5)	0.05
2006	7 (25.9)	0.33	2 (25.0)	0.10
2007	9 (33.3)	0.43	3 (37.5)	0.14
2008	5 (18.5)	0.24	2 (25.0)	0.10
Total	N 27	1.28	8 (100.0)	0.38
	% 100.0	-	29.6	-

TABLE 2. Meningiomas of the basis crani anterior sipas according to age and gender

Gender	Total number of Meningiomas		Meningioma of the basis crani anterior	
	Age (Mean $\pm$ SD)	N (%)	Age (Mean $\pm$ SD)	N (%)
F	54.5 $\pm$ 12.1	18 (66.7)	38.8 $\pm$ 15.0	6 (75.0)
M	58.8 $\pm$ 18.6	9 (33.3)	35.0 $\pm$ 5.7	2 (25.0)
Total	55.9 $\pm$ 11.3	27 (100.0)	37.9 $\pm$ 13.0	8 (100.0)
	T = 0.726, p>0.05	$\chi^2=3.0$, p>0.05	T=0.33, p>0.05	

year 2005.

The increased rate of morbidity was recorded during year 2007, with 0.14:100000 populations, the reduced rate was evident during year 2005 with 0.05:100000 populations.

TABLE 3. Localization of meningiomas of the basis cranii

Localization of Meningiomas							
M. olfactoria		M. sfenoidale		M. suprasellare		Total	
N	%	N	%	N	%	N	%
1	12.5	4	50	3	37.5	8	100

From the total number of meningiomas (n=27) detected in our clinic during 2005-2007 year period, female patients dominate with 18 cases (66.7%), in correlation with male gender, 9 cases (33.3%). It is evident that proportion female/male was 2:1.

The mean age of patients with meningioma was 55.9 yr. (SD $\pm$ 11.3 yr.). The mean age for female was 54.5 yr. (SD $\pm$ 12.1 yr.), and age for male was 58.8 yr. (SD $\pm$ 18.6 yr.). The calculation with the t-test shows no significant difference in patients with regards to gender (T = 0.726, p>0.05).

From the total number of meningiomas (n=8) localized in anterior basis crani, detected in our clinic

during 2005-2007 year period, female patients dominate with 6 cases (75.0%), in correlation with male gender, 2 cases (25.0%).

The mean age of patients with anterior basis crani meningioma was 37.9 yr. (SD $\pm$ 13.0 yr.). The mean age for female was 38.8 yr. (SD $\pm$ 15.0 yr), and age for male was 35.0 yr. (SD $\pm$ 5.7 yr.). The calculation with the t-test shows no significant difference in patients with regards to gender ($T = 0.33$, $p > 0.05$) (Table 2). However the mean age of patients with basis crani meningioma was significantly lower, according to total number of meningiomas ($T = 3.82$, $p < 0.01$). In our study, the localization of basis crani meningiomas was sphenoidal in 50% of patients, suprasellar in 37.5% and olfactory in 12.5% of patients (Table 3).

4. CONCLUSIONS

Meningiomas of the basis crani anterior are not rare tumours, accounting for approximately 29.6% of all intracranial meningiomas, identified during the four year period in our country. CT and MRI enable a correct diagnosis of basis crani meningiomas in most of cases, but are impossible to predict the patient outcomes. MRI revealed superior anatomic detail compared with CT-scan. Surgery is the gold standard of treatment, but recidivs and residues of tumours are not uncommon.

REFERENCES

1. Brain and spinal cord. In: American Joint Committee on Cancer. AJCC Cancer Staging Manual. 6th ed. New York, NY: Springer, 2002: 387-90.
2. CNS tumors Clacification. Publication of Word Health Organization, 2000: 163-96.
3. Goldberg HI, Lavi E, Atlas SW. Ekstra-aksial tumors. In: Atlas SW. Magnetic resonance imaging of the brain and spine, Second edition, Lippincott- Raven, Philadelphia, 1996: 423-87.
4. Juan M. Taveras "Neuroradiology" Third Edition, 1996: 676-19.
5. Levin VA, Leibel SA, Gutin PH. Neoplasms of the central nervous system. In: DeVita VT Jr, Hellman S, Rosenberg SA, eds.: Cancer: Principles and Practice of Oncology. 6th ed. Philadelphia, Pa: Lippincott Williams & Wilkins, 2001: 2100-60.
6. Hoster N, Liebig Th. "CT of th Head and Spine, 2001: 121-95.
7. Noordijk EM, Vecht CJ, Haaxma-Reiche H, et al. The choice of treatment of single brain metastasis should be based on extracranial tumor activity and age. Int J Radiat Oncol Biol Phys, 1994; 29(4): 711-7.
8. Osborn AG, Brain top 100 diagnoses, W.B.Saunders Company, Amirsys, 2002: 116.
9. Grumme T, Kluge W, Kretzchamar K, Rosleler A. "Cerebral and Spinal CT ", 1998: 142-79

Corresponding author: Serbeze Kabashi, MD, PhD. Institute of radiology . Clinical center University of Prishtina, Republic of Kosova.
E-mail: sebikabashi@yahoo.com



In partnership with:



ISfTeH Members Save 25%
Use promotional code **EHG478**

Acknowledged as the leading European forum on health care innovation, The **5th Annual World Health Care Congress Europe** presents business cases, best practices and strategies for addressing the pressure and current challenges facing European health care - efficiency, economic stability, access to care, quality care, patient safety, and patient mobility within and across borders.

- Over 1500 CEOs, senior level executives and thought leaders, and government officials from health care systems, hospitals, physician groups and insurers have attended WHCCE since 2005
- Comprises 100+ internationally recognized leaders in health care, including health ministers, leading government officials, hospital directors, IT innovators, decision makers from private and public insurance funds, pharmaceutical and medical device companies, and health care industry suppliers
- Key health ministers from leading countries in Europe, Middle East and Asia will showcase their national initiatives to redefine regional health agendas for 2009 and beyond
- Presentations, roundtables and case studies from the countries with the best health care - France, Japan, Spain, Italy, Canada, Norway, Netherlands, Sweden, Greece, Austria, Germany, Finland, New Zealand, Denmark, United Kingdom, Ireland and Portugal
- Growing international delegations from the Middle East and Asia
- Unmatched networking opportunities through interactive discussions within the conference and informal discussions during gala receptions and invitational dinners

In-depth case studies address the following themes: