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Symptoms caused by parasellar meningioma

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Keywords

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Abstract

Introduction: Intracranial space-occupying processes can lead to a diverse set of complaints. Ocular anomalies caused by parasellar meningioma and their treatment options are presented in this paper through one case.

Case report: A 64 year old woman visited our clinic complaining about blurred-vision in her right eye, feeling of unstableness and appearance of colourful circles when looking into the light - negatively affecting her everyday life. With hypermetropic correction she had 1.0 visual acuity (VA) on both eyes. Following an extensive neuroophthalmological investigation, no significant anomalies were discovered: neither at the anterior, nor at the posterior segment. After a couple of months, with stable VA partial right-sided oculomotor nerve palsy was developed with an increasing degree of diplopia. Restricted upward eye-movement with aslight ptosis and mydriasis were also observed. An explanation to the complaints was provided by a cranial- and orbital MRI: parasellar meningioma has been diagnosed at the patient. The carotid siphon was medially dislocated: running alongside the right optic nerve for a short section, almost reaching the chiasm. Following neurosurgical consultation the surgical removal of the tumour was suggested. However - due to inherent surgical risks (e.g. potential loss of vision) - the patient is reluctant at the moment and refuses the operation trying to continue living with the disturbing diplopia.

Conclusion: Space-occupying processes around the orbital apex or the cavernous sinus often begin with ophthalmological complaints that are difficult to detect. If the cause is discovered before the optic nerve is damaged, there is a better chance to preserve vision following a surgical intervention.

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Introduction

Meningioma is the most common primary intracranial space-occupying tumor. It can appear at any age but most commonly at women in their 50s. The appearance of meningiomas are 60% sporadic, 40% caused by unknown factors. In terms of the location two general types can be identified: primary (ONSM) and secondary. The primary tumor starts to grow intraorbital or intracanalicular, while the secondary type develops intracranial mainly from the os sphenoidale or the sella turcica regions. The former type covers only 1% of all meningiomas and is more common at neurofibromatosis type 2. Both types are painless, they might cause slowly deteriorating vision, slight proptosis and sometimes diplopia. If the tumor compresses the optic nerve directly or causes intracranial pressure increase, it leads usually to visual impairment or occasionally to loss of vision on the affected eye. Generally it is histologically benign, but at a few cases it might become malignant and emerge as metastasis (mainly as breast or lung carcinoma). It should be differentiated from schwannoma, neurofibroma, ependymoma, astrocytoma, haemangiopericytoma, metastatic carcinoma.

Case report

The patient visited our clinic for the first time in May 2014, complaining about feeling of unstableness and appearance of colourful circles when looking into the light. Her symptoms were present for 6 months. In February she noticed narrower right palpebral fissure and lachrymation, since March she perceived blurred-vision. The patient wearing multifocal glasses for years summarized her complaints: „I see differently than earlier." Moreover she had 1.0 BCVA with hypermetropic correction.

Her history did not include any serious eye diseases, did not suffer any blows or trauma. From her general history a tonsillectomy and a right-sided hip replacement surgery can be highlighted.

During the inspection we observed that the right palpebral fissure was minimally narrower compared to the opposite side (5/7mm) (Fig. 1).

During guided eye movements the upward movement of the right eye was limited (Fig. 2), in the other eight directions the motor functions were normal, however looking left the patient indicated explicit diplopia.

No side differences were observed with Hertel's exophthalmometer/16/16 mm/. At that time the direct and indirect pupillary reactions were intact, diameter differences between the two pupils were 0.8 mm. Following a basic slit lamp investigation, no significant anomalies were discovered: neither at the anterior, nor at the posterior segment.

The critical fusion frequency (CFF) – which scans the function of the optic nerve –showed slight decrease on both sides (33/35 Hz). Dysfunction of the right and the over-activity of the left superior rectus muscle were observed with the help of Hess-chart. Goldmann-type perimeter inspection revealed a dent in the isopter on the top-right side and a minimal widening of the blind spot on the left (!) side. For the sake of completeness we also carried out an ultrasound examination which did not detect any pathological differences in the orbit.

Discussion

Since no ophthalmological explanation could be found for the eye-movement disorder, right-sided ptosis or for the functional deviation of the optic nerve, suspicion for an intracranial space-occupation was raised. A week later a cranial- and orbital MRI confirmed a parasellar meningioma at the patient. It intensively accumulated gadolinium on the right side of the medium scala with a size of 18x25x30 mm (Fig. 3). The carotis syphon was medially dislocated: running alongside the right optic nerve for a short section, reaching the chiasm.

Cranial MRI with gadolinium has a prominent role in diagnosing parasellar meningioma, because this tumor's homogenous enhancement cannot be confused with a malignant tumor. Calcified areas can be revealed through CT inspection without contrast agent.

Treatment options: tumors causing no complaints demand close observation. There are mixed views on the treatment opinions. Many publications appeared on

Figure 1. Right-sided slight ptosis and mydriasis.

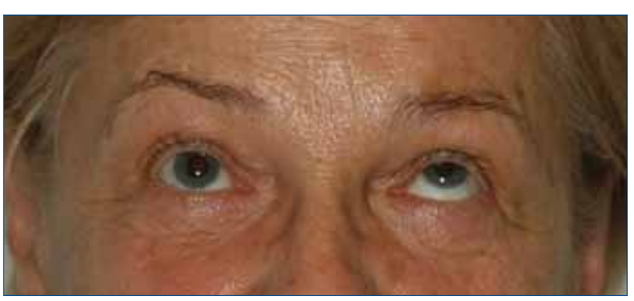

Figure 2. Right-sided paralysis of superior rectus muscle.

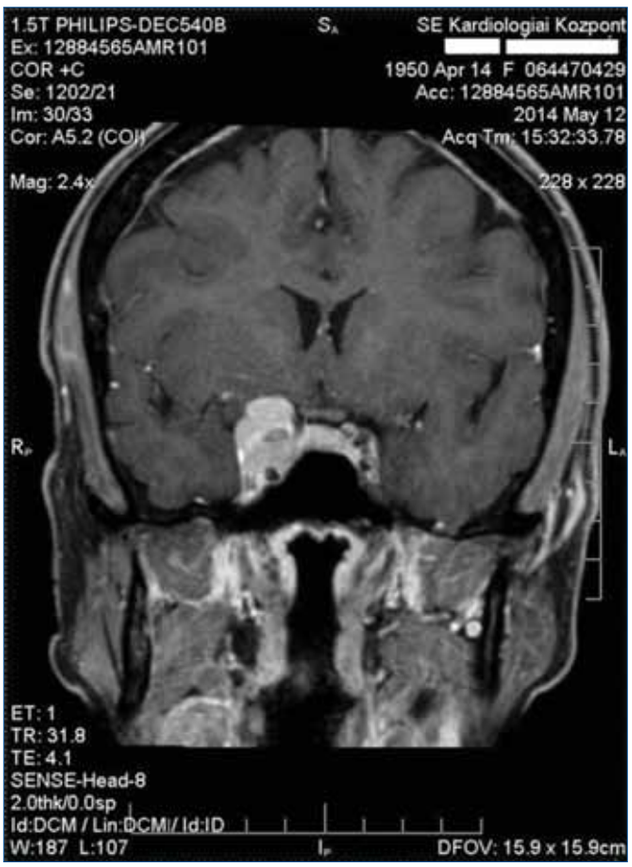

Figure 3. Cranial MRI with gadolinium: parasellar meningioma in the medium scala.

3D-CRT and single-fraction stereotactic radiosurgery: these enable no permanent solution and can lead to side effects such as iritis, dry eyes and orbital pain. In case of complaints, surgical intervention should be considered, even though the extension of the resection is problematic. In case of sphenoid wing meningiomas total surgical removal is often not possible. Conservative resection combined with radiosurgery has showed similar results as aggressive excision.

Another future option would be drug therapy. Most meningiomas are immunohistochemically positive to epithelial membrane antigen and vimentin, while negative to glial fibrillary antigen. Hormones have an effect on the size of the tumor: increase in size was observed during pregnancy and menses. Olson and others have studied in vitro the inhibition of meningiomas' cell receptors. Estradiol 17-beta, progesterone and tamoxifen stimulated growth in some cell cultures. At 5 out of 14 inoperable cases Mifepriston (RU 486) resulted in a 10% reduction of the tumor, however the state of 3 other patients worsened. So given the current state of our knowledge the drug therapy does not influence tumor formation.

Following neurosurgical consultation the surgical removal of the tumor was suggested. However – due to inherent surgical risks (e.g. potential loss of vision) – the patient is reluctant at the moment and refuses the operation: besides eye care she is searching for alternative cures.

Conclusion

During the observations the patient's complaints intensified: her right-sided eye movements are limited in all directions, right-sided pupil dilatation is visible even for the naked eye. The repeated Hess-chart examination shows the progression well. The increased complaints due to diplopia could not be treated with prismatic glasses: the patient has to continue living with the disturbing double-vision. Over a year we observed clear progression in her ophthalmological status: the control MRI confirmed the growth of the tumor.

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