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Professional paper

Neuroophthalmologic Diagnosis of the Sella Turca Region

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A B S T R A C T

A chiasm n. optici is shaped by crossed optic nerves. Approximate vertical distance of 10 mm separates chiasm from dorsum sella turca and pituitary fosse. Twenty-five percent of all cerebral tumors appear in the chiasm area and almost half of them cause damages of visual function. Major and sometimes the only symptom is progressive visual loss. This damage appears because tumor masses are huge and are compressing optic nerves. Sellar region lesions must already be spreading suprasellary before patient can notice visual field defects. The sign of advanced process is symmetric or asymmetric loss of visual acuity or visual field defects. The aim of this study was to show the importance of visual field in the diagnosis of sellar disorders as well as in treatments. Eighteen patients with chiasm disorders were analyzed. Visual field was analyzed before and after treatment according to visual field classifications. The study has shown the importance of visual field testing in diagnosis of sellar processes, as well as in following therapy, surgical or conservative.

Introduction

Crossing of the fibres of the optic nerves shapes the optic chiasm. The approximate vertical distance of 10 mm separates chiasm from dorsum sella turcica and pituitary fossa. Chiasm is not always in constant relation to hypophysis. A body of chiasm lies over hypophysis in 80% of patients, over tuberculum sellae in 9% and over dorsum sellae in 11% of patients. Twenty-five percent of all cerebral tumors is estimated to appear in the area of chiasm and almost half of them cause damages of visual function. Major and sometimes the only symptom is progressive visual loss. Visual deterioration is a result of huge tumor masses, which are compressing the optic nerves. Thus, visual function deterioration and visual field defects, symmetric or asymmetric in both eyes, are signs of the advanced pro-

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cess. Cases of frequent initial bitemporal defects, without the loss of visual acuity, arouse suspicion of chiasmatic processes.

Patients and Methods

We analyzed 28 patients with chiasmatic processes. The majority were between 20 and 40 years of age. We followed the ophthalmic symptoms, which included the loss of visual acuity, intermittent diplopia and headache. Visual acuity was tested by means of Snellen charts and refractometer[3]. Patients' visual fields were tested by means of kinetic light perimetry in photopia with Goldmann perimeter[4]. Visual fields according to Goldmann were analyzed before and after treatment according to visual filed classification. Visual fields were classified into 7 categories:

0. Normal visual field findings
1. Narrowing of I1 and initial expanding of the blind spot
2. Narrowing of I1 and I2 isopters, with I1 excluding or disclosing the expanded blind spot
3. Sectorial defect of visual field in the upper and temporal part
4. Complete bitemporal visual field defect
5. Complete bitemporal visual field defect and large narrowing of other halves of visual fields without internal isopters
6. Loss of vision (visual field cannot be tested)

TABLE 1
AGE PERCENTAGES

Years	Number	%
20–40	10	56
40–60	3	16
60–80	4	22
over 80	1	6
TOTAL	18	100

TABLE 2
GENDER PERCENTAGES

Gender	Number	%
male	4	22
female	14	78
TOTAL	18	100

TABLE 3
PATIENTS' SYMPTOMS

Symptoms	Number	%
ophthalmologic	5	27
non-ophthalmologic	13	73
TOTAL	18	100

TABLE 4
SURGICAL TREATMENT

Surgery	Number	%
Yes	4	22
No	14	78
TOTAL	18	100

Results

Tables 1 and 2 show gender and age percentages. The majority of patients were between 20 and 40 years of age. One patient was over 80. Of 18 patients, 4 (22%) were men and 14 (78%) were women. Twenty-seven percent of patients had ophthalmic symptoms and 73% had non-ophthalmic symptoms. Table 5 shows the improvement of visual field after the treatment. Seven patients did not show recovery in either eye, one patient showed 28.6% recovery in both eyes, one patient showed 28.6% recovery in the left eye and no recovery in the right eye, 3 patients showed 28.6% recovery in the left eye and 14.3% in the right eye, 2 patients showed 14.3% recovery in both eyes and 4 patients showed 14.3% recovery in one eye.

TABLE 5
VISUAL FIELD IMPROVEMENT AFTER TREATMENT

Number	VF 1 (d)	VF 1 (s)	VF 2 (d)	VF 2 (s)	% recovery VF (d)	% recovery VF (s)
1	1	1	0	0	14.3	14.3
2	3	3	3	3	0	0
3	6	4	6	2	0	28.6
4	4	4	4	4	0	0
5	2	1	2	1	0	0
6	1	2	1	1	0	14.3
7	0	2	0	1	0	14.3
8	6	4	6	3	0	14.3
9	1	1	0	0	14.3	14.3
10	3	2	3	2	0	0
11	1	0	0	0	14.3	0
12	1	2	1	2	0	0
13	2	2	1	0	14.3	28.6
14	1	1	1	1	0	0
15	4	4	2	2	28.6	28.6
16	4	3	3	1	14.3	28.6
17	2	3	1	1	14.3	28.6
18	1	1	1	1	0	0

Discussion

The predominance of hypophysial tumors in chiasmatic diseases explains the observed bitemporal defects, often symmetrical, in visual field. Mechanical factors play major role in the mechanism of visual field defects. Tumors of the sellar area are more common among women younger than 40, which corresponds to literature data[6,7]. Authors suggest endocrinologic or neurosurgical therapy. Some of our patients underwent conservative therapy, which corresponds to literature data[4,6,8]. The most common are bitemporal defects, then scotomas, homonymous hemianopia, prechiasmatic anopsia and prechiasmatic defects of visual field, which corresponds to our results[3,5,7,10].

This study shows the importance of visual field in the diagnosis and therapy of the sellar process in relation to other invasive methods as CT, MRI, arteriography, which also corresponds to literature data[4–6,9,10].

Numerous authors agree that clinical diagnosis of chiasmatic diseases is based on perimetry[3,5,7]. Our results show that visual field tests often raise the initial suspicion of sellar processes. The same symptoms are found in the refractive errors at myopia higher than 3 dpth. In differential diagnosis we should, thus, consider the possibility of »myopic damage«. Chiasmatic disturbance of visual acuity can be observed when chiasma and vascular component are compromised. Pituitary lesions must have massive suprasellar spreadings before they start to create visual field defects[11,12]. Small intrasellar lesion does not provoke marked visual fields defects.

Conclusion

Visual field testing and its right interpretation, even before the appearance of clear symptoms and sophisticated tests (CT, MRI), rise suspicion of chiasmatic processes. This completely noninvasive method is of great importance in following surgical and non-surgical treatments of sellar processes. Therefore, perimetry is of great help in discovering and following the dynamics of sellar processes.

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NEUROOFTALMOOŠKA DIJAGNOSTIKA SELARNOG PODRUČJA

SAŽETAK

Optička hijazma oblikovana je križanjem vidnih živaca. Prosječna vertikalna distanca od 10 mm odvaja hijazmu od dorsuma sele i pituitarne fose. Hijazma nema uvijek konstantan odnos prema hipofizi. Tijelo hijazme položeno je preko hipofize u 80% bolesnika, preko tuberkuluma sele u 9% i preko dorsuma sele u 11% bolesnika. Procjenjuje se da se 25% svih tumora mozga javlja u području hijazme, a gotovo polovica njih stvara početne tegobe oštećenja vidne funkcije. Glavni i katkad jedini simptom je progresivni gubitak vida. Oštećenje vida javlja se stoga što su tumorske mase velike te u cijelosti iskrivljuju hijazmu i kompromitiraju vidne živce. Pituitarne lezije moraju imati već bitno supraselarno širenje prije nego se počnu stvarati ispadi vidnog polja. Tako je oštećenje vidne funkcije i opsežno oštećenje vidnog polja, simetrično ili asimetrično na oba oka, znak uznapredovalog procesa. Cilj ovog istraživanja bio je pokazati važnost vidnog polja u dijagnostici hijazmalnih bolesti te u praćenju liječenja. U retrospektivnoj studiji praćeno je 18 bolesnika s tumorom u hijazmatskom području. Praćene su promjene vidnog polja prije i poslije terapije s tim da su ispadi vidnog polja kategorizirani u 6 kategorija. Naglašena je važnost testiranja vidnog polja kao neagresivne metode i njgova pravilna interpretacija u dijagstici hijazmatskih procesa te u praćenju terapije bilo kirurške ili konzervativne.