MR Imaging of Primary Hypophysitis

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Methods

Six patients (5 females, 1 male), aged 22 to 47 years (mean 32.33 years), with pathologically-proven primary hypophysitis (PH) were studied retrospectively. No recent pregnancy or postpartum was related with the female patients and no underlying autoimmunity was noted in this study. Pre- and post- contrast enhanced MR scanning of sellar region was performed in all cases after the symptoms onset. All patients were scanned with thin slices spin-echo T1WI in coronal and sagittal planes, Slice thickness was 3 mm, with a 0-0.5mm interval. Same scans were repeated after intravenous injection of 0.1mmol/kg Gd-DTPA. Extra FSE T2WI either in sagittal plane or coronal plane was obtained before contrast enhanced scan. Initial MR imaging was performed before transsphenoidal surgery. On each examination, adenohypophysis, neurohypophysis, pituitary stalk, infundibulum, optic chiasm, and cavernous sinus were assessed.

Results

There were 5 cases of lymphocytic hypophysitis (LyH) and 1 case of idiopathic giant-cell granulomatous hypophysitis (GH) in this study. In the case of GH, the patient showed secondary amenorrhea for 4 months and galactorrhea for 2 months, MRI displayed that normal high signal of neurohypophysis on T1WI remained, pituitary stalk was within normal range, only adenohypophysis enlarged, with homogeneous enhancement (Fig A, B). In the other 5 cases of LyH, clinical symptoms included: (1) headache (n=4); (2) polydipsia and polyuria (n=4); (3) diplopia (n=2); (4) low fever and fatigue (n=1); (5) secondary amenorrhea (n=1); (6) visual field defect (n=1). Four patients underwent endocrine tests before surgery, and mild partial hypopituitarism was found in one and mild hyperprolactinemia was in 2 of them. MRI findings of LyH group included: (1) enlargement of pituitary (n=5), showing mild low T1 signal (n=4), among them 2 cases with ill-defined margin; (2) infundibulum involvement (n=5); (3) pituitary stalk thickening (n=4) (Fig. C, D); (4) disappearance of normal high signal of neurohypophysis (n=5) (Fig C); (5) cavernous sinus involvement (n=2) (Fig. E); (6) marked involvement of dura on dorsum sella and adjacent clivus (n=2) (Fig. F); (7) cystic change of the pituitary mass (n=1) (Fig G, H); (8) evident Gadolinium enhancement of all the lesions (n=5), of them, homogeneous enhancement in 2 cases (Fig. D), and inhomogeneous enhancement in 3 cases (Fig E).

Discussion

PH is suggested as an autoimmune pathogenesis of the pituitary. Women are affected more frequently than men with a ratio of about 5:1[1]. It's considered that PH, esp. LyH, seems to be strongly correlated with pregnancy, postpartum and co-existing autoimmune disorders[1]. However, cases without these conditions have been reported increasingly as it is in our report.

The extent of inflammation process is closely correlated to symptoms and signs. When the inflammation is confined to the anterior lobe of pituitary, it is called adenohypophysitis, which may present hypopituitarism, as it is in our case 1 (Fig A, B). When the posterior hypophysis and the infundibulum are affected, it is indicated as infundibulo-neurohypophysitis[2], which usually show characteristic diabetes insipidus. When the whole pituitary, pituitary stalk, and the infundibulum are all involved, it is considered as infundibulo-hypophysitis[2], which may demonstrate variant degrees of pituitary dysfunction.

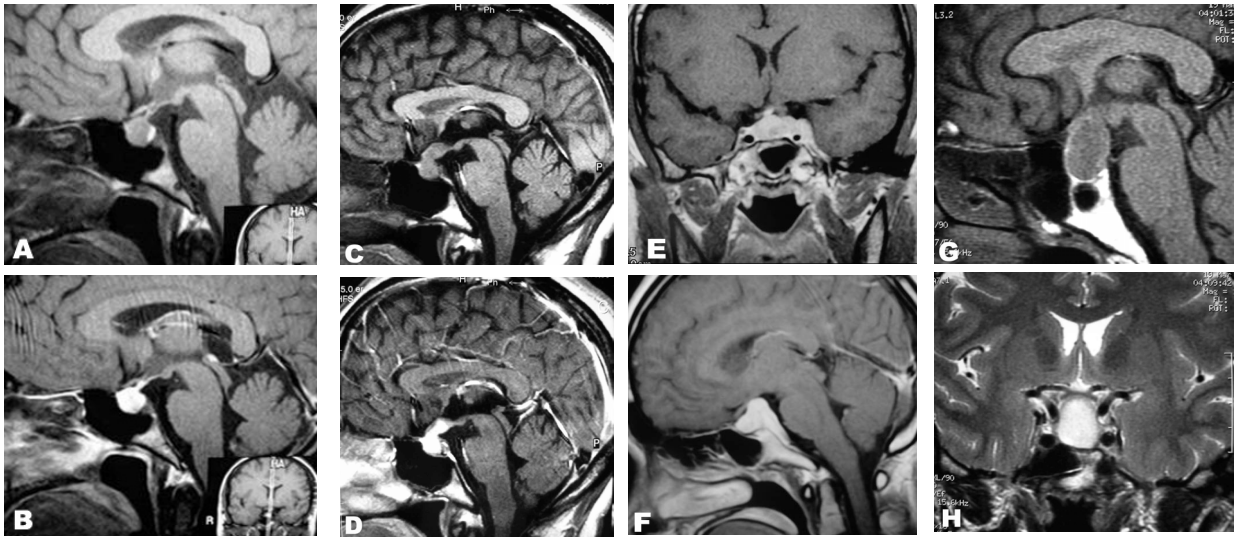
Inflammatory processes of the hypophysis can be misdiagnosed because their clinical and radiological features mimic tumors in the sellar or parasellar region[3]. Comparing MRI findings with PH to pituitary adenoma, the most common features of PH are a homogeneous enhanced pituitary mass with a thickened stalk, and loss of normal neurohypophysis appearance (Fig. C, D). However, pituitary adenoma often presents as an inhomogeneous delayed enhanced unilateral sellar mass. Despite MRI improves the diagnosis, findings from imaging tend to overlap. Progressive LyH may disclose a large inhomogeneous sellar and suprasellar mass, adjacent dura mater infiltration[4], and cavernous sinus involvement (Fig. E-H). Under this condition, differential diagnosis becomes more difficult. Adjacent dura mater infiltration seems more often found in hypophysitis than in adenoma.

Conclusion

Primary hypophysitis should be considered in the differential diagnosis of a patient presenting with a pituitary mass, hypopituitarism and cranial diabetes insipidus. Although there were no striking MRI finding in distinguishing primary hypophysitis from pituitary adenoma, careful analysis of abovementioned MR imaging features and close correlation with the clinical manifestations can allow a more specific diagnosis, which is essential and helpful to the treatment.

References

[1] Hashimoto K, et al, Endocrine Journal 1997;44:1-10.
[2] Sato N, et al, AJNR 1998;19:439-444.
[3] Bellastella A, et al, Eur J Endocrinol. 2003;149:363-76.
[4] Nakamura Y, et al, J Endocrinol Invest 2001;24:262-267.



Case 1: Fig. A, B, female, 39yrs, secondary amenorrhea and galactorrhea, sagittal T1WI showed normal high signal of neurohypophysis remained, pituitary stalk was normal, only adenohypophysis enlarged, with homogeneous enhancement. Idiopathic giant-cell granulomatous hypophysitis was found after surgery. Case 2: Fig. C, D, female, 47yrs, headache, polydipsia and polyuria for 2 months, no high signal of neurohypophysis displayed, pituitary enlarged with infundibulum involvement and pituitary stalk thickening, homogeneous enhancement (LyH). Case 3: Fig. E, F, female, 22yrs, headache, diabetes insipidus, and diplopia, contrast enhanced MRI demonstrated left cavernous sinus was infiltrated by the lesion, inhomogeneous enhancement of the enlarged pituitary, the sellar floor was flat, significant involvement of dura on dorsum sellar and adjacent clivus (LyH). Case 4: Fig. G, H, female, 32yrs, headache, and visual field defect, MRI displayed a large cystic mass at sellar and suprasellar region, optic chiasm compression, pituitary adenoma was presumed, LyH was found after surgery.