Pituitary stalk compression by dorsum sellae and growth disorders.

Toshiaki Taoka[1], Toshiaki Akashi[1], Masahiko Sakamoto[1], Toshiteru Miyasaka[1], Tomoko Ochi[1], Saeka Hori[1], Takeshi Wada[1], and Kimihiko Kichikawa[1]

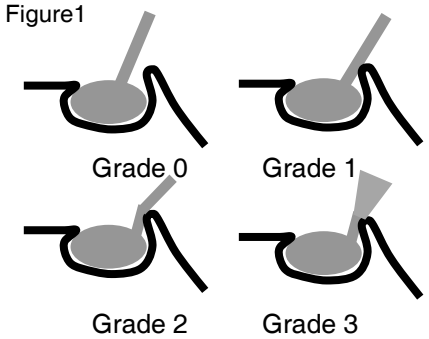
[1]*Radiology, Nara Medical University, Kashihara, Nara, Japan*

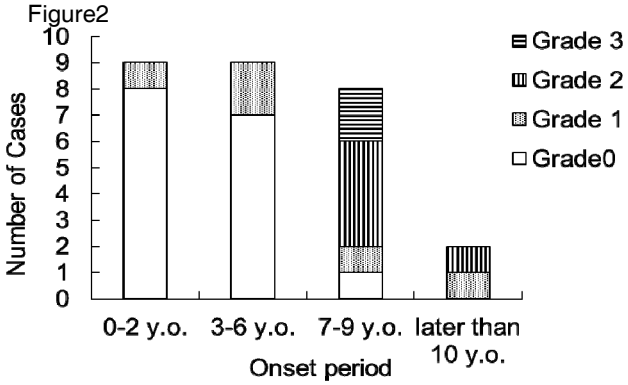
Purpose: Current study started from our experience of short stature patients with pituitary stalk compression like finding by dorsum sellae accompanying stalk deformity. The purpose of our study is to clarify the relationship between pituitary stalk compression and clinical findings in short stature cases.

Materials and Methods: We retrospectively reviewed MR images of pituitary gland and pituitary stalk for the 34 short stature children without transection of pituitary stalk. Short stature was defined as a height for chronological age less than mean minus 2 standard deviation. We categorized onset age of short stature symptom as follows; 0 to 2 years old (11 cases), 3 to 6 years old (11 cases), 7 to 9 years old (10 cases) and later than 10 years old (2 cases) (Fig. 1). We categorized the cases with onset age older than 7 years as "late onset group" and the cases with onset age younger than 6 years old as "early onset group". As controls, we evaluated MR images of the age-matched population without any clinical evidence of hypothalamo-pituitary diseases.

A 1.5T and a 1.0 T clinical MR unit were used for acquisition of T1-weighted sagittal images of pituitary gland. Images were obtained using a spin echo sequence with head coils. We evaluated the relationship between pituitary stalk and dorsum sellae for all 34 cases of short stature group and for 24 cases of control group. We categorized correlation between pituitary stalk and dorsum sellae into four grades as follows (Fig 1); Grade 0: no contact between stalk and dorsum sellae, Grade 1: contact between stalk and dorsum sellae without any deformity of pituitary stalk, Grade 2: contact with bending of the stalk, and Grade 3: contact with bulging of the stalk at the proximal point of contact. Grade 2 and 3 cases were regarded as cases with compression of the pituitary stalk with stalk deformity by the dorsum sellae, and grade 0 and 1 were regarded as cases without obvious stalk compression.

We made $\chi 2$ test between degree of compression (cases of grade 0, 1 and cases of grade 2, 3) and presence of short stature. In addition, in order to compare onset age between "early onset group" and "late onset group", we made statistic comparison in the 26 cases with age older than 7 years at imaging.





Results: Nineteen cases out of 34 cases in short stature group and 22 cases out of 24 control group showed Grade 0 findings. Grade 1 findings were seen in 6 cases in short stature group (n=34) and 2 cases in control group (n=24). While, grade 2 compressions were seen in 7 cases, and grade 3 compressions were seen in 2 cases. There were no cases of Grade 2 and 3 in control group. Significant difference was seen in the frequency of Grade 2 and 3 between short stature group and control grope ($p<0.01$). In "late onset group", proportions of the cases with stalk compression accompanying stalk deformity increased (Figure 2). There was significant difference in onset age between in the group of Grade 0 and 1, and group of Grade 2 and 3 ($p<0.001$) by Fisher exact test.

Discussion/Conclusion: Compressions of pituitary stalk with stalk deformity has close relationship to late childhood onset short stature cases with GH deficiency in our series. When pituitary stalk compression by dorsum sellae is observed in late childhood onset short stature cases, and stalk show bending or deformity by sellae, influence of stalk compression might be considered as cause of decreased GH.