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A small sella turcica is a normal anatomical variant responsible for an inadequacy between the sellar volume and its content, with a resultant bulging of the pituitary gland. It can mimic a pathological enlargement of the pituitary gland and, if not recognized, can lead to a false diagnosis of “pituitary hyperplasia” or even pituitary tumor. This is particularly true in teenage females with physiological enlargement of the pituitary gland.

In adults, a small sella turcica is frequently related to a hyperpneumatization of the sphenoid sinus. It feels like excessive pneumatization of the sphenoid sinus inhibits the complete development of the pituitary fossa. Hyperpneumatization of the sphenoid sinus may be associated with a flat or narrow sella and a resultant bulging of the pituitary gland.

A thick dorsum sellae, either pneumatized or fatty, can restrict the anteroposterior diameter of the pituitary fossa. The sella turcica can also be short transversally. This condition is difficult to apprehend: we must bear in mind that only 2 out of 100 adults have a sellar floor width of less than 10 mm. Therefore, an upward convex pituitary gland above a sella floor less than 10 mm wide is very likely to be an anatomical variant (Fig. 3.1).

In summary, in front of what looks like an enlarged pituitary gland with normal T1 and T2 signals and normal enhancement after gadolinium injection, a small sella has to be evoked: for

instance, in the case of unusual hyperpneumatization of the sphenoid sinus, such as pneumatization extending beyond the sphenoid-occipital synchondrosis or deep in the pterygoid processes. Asymmetrical hyperpneumatization may be particularly misleading (Fig. 3.2). Blistering of the planum sphenoidale also accompanies sphenoid sinus hyperpneumatization (Fig. 3.3). The shape of the dorsum sellae and the sellar width must also be carefully scrutinized.

Differential diagnosis of an upward bulging of the pituitary gland includes mainly the holosellar pituitary adenoma. In the latter, the posterior lobe appears compressed on axial T1WI, but not in the case of a bulging normal pituitary gland above a small sella turcica. An ignored or masked pregnancy in women of child-bearing age must also be kept in mind: T1 hyperintensity of the pituitary gland, if compared with the pons on sagittal T1WI, will make the diagnosis beyond the second trimester of the pregnancy. The useful volume of a normal-sized sella can also rarely be reduced by an unusually large inferior coronary sinus, for instance, “kissing” internal carotid arteries (Fig. 56.5) or a sellar spine (Fig. 3.4). Finally, several factors can be associated with reduction in sellar volume (Fig. 3.5) Conversely, a small sella or a narrowed sellar volume are not necessarily associated with an upward bulging of the pituitary gland.

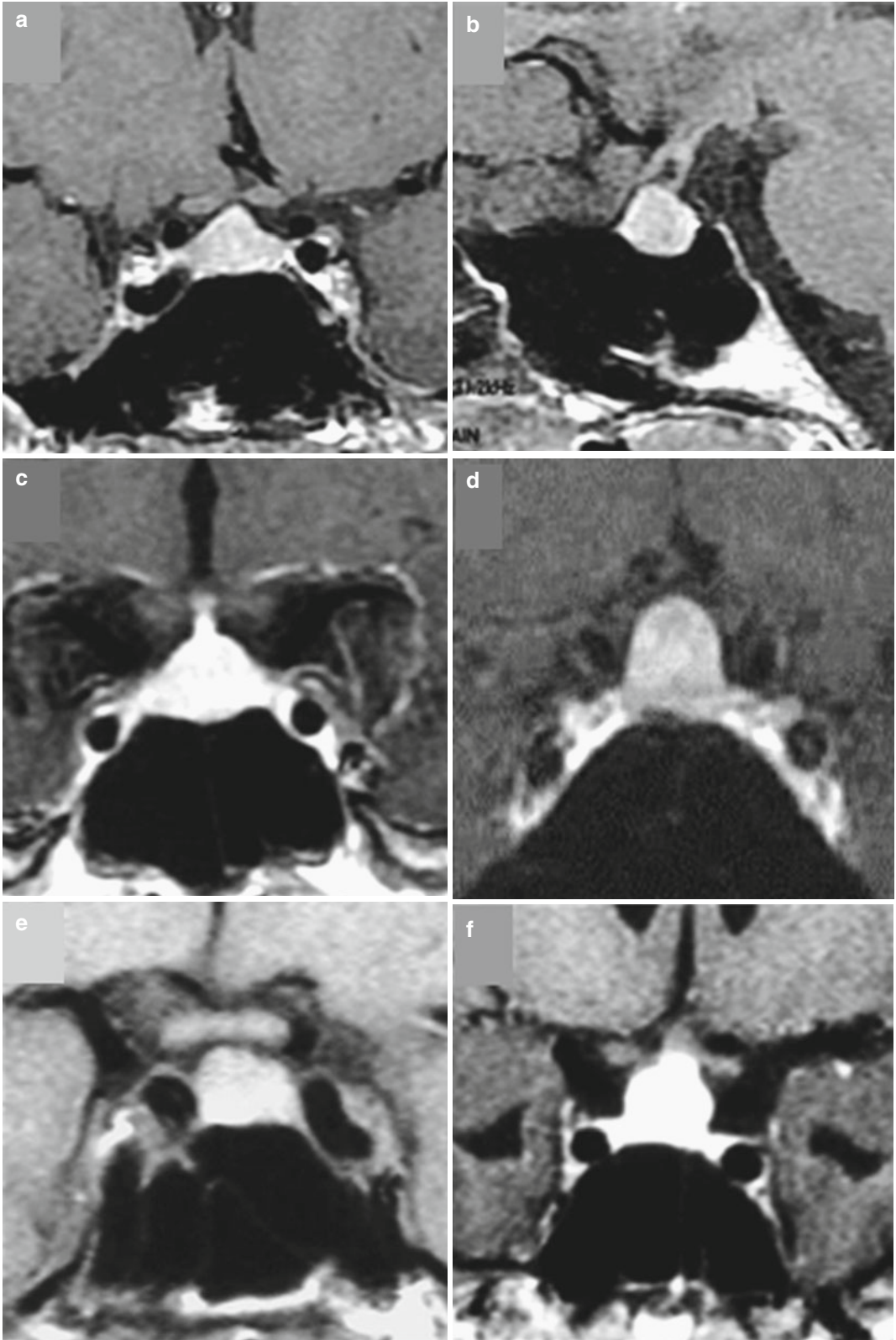


Fig. 3.1 (a, b) Physiological bulging of the pituitary gland on coronal and sagittal CE T1WI. (c-f) Coronal CE T1WI. Small sella, hyperpneumatization of the sphenoid sinus, and/or narrow sellar floor

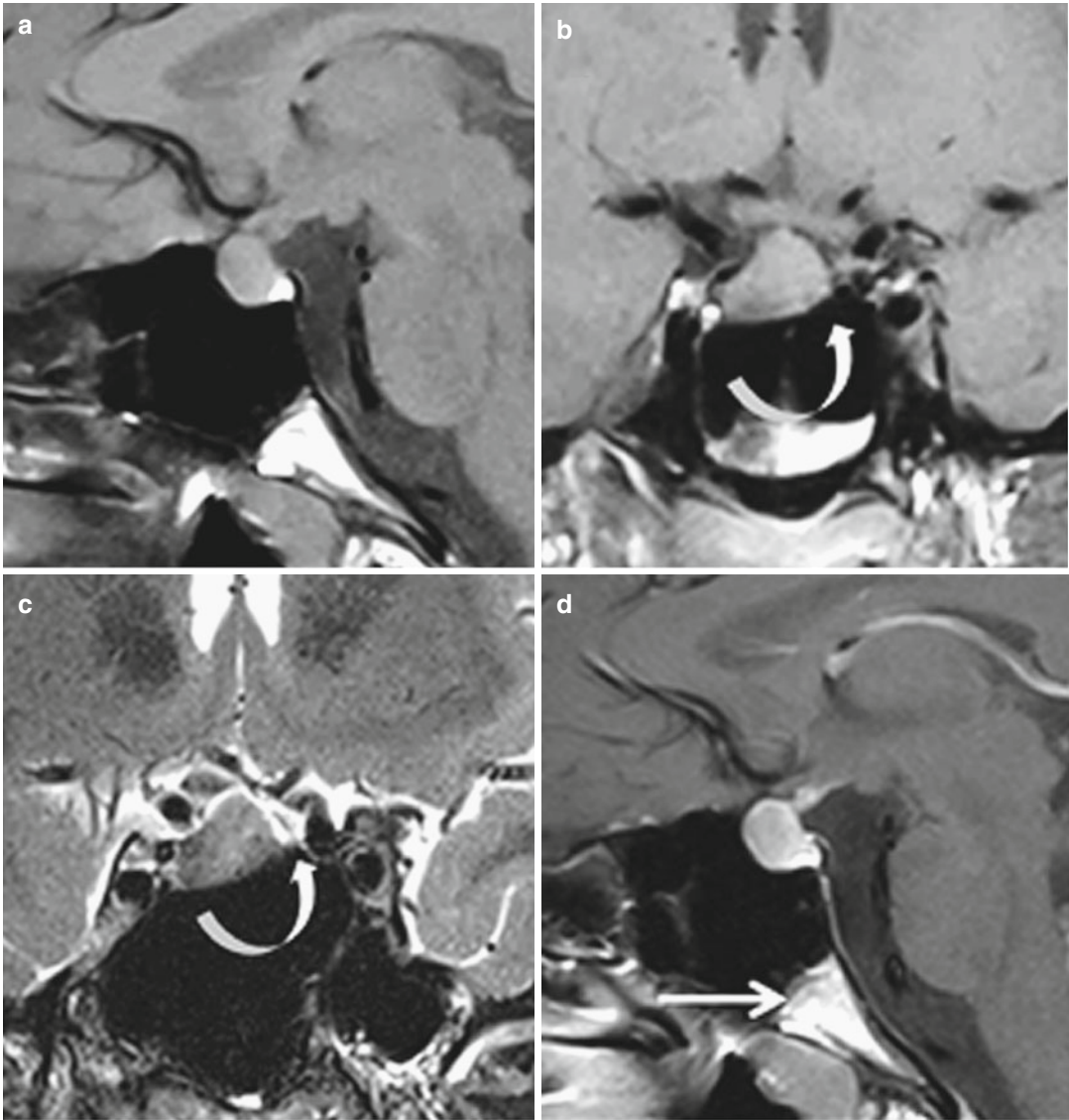


Fig. 3.2 Physiological bulging of the pituitary gland in a 16-year-old girl. Asymmetrical hyperpneumatization. (a, d) Sagittal T1 and CE T1WIs. (b, e) Coronal T1 and CET1WIs. (c) coronal T2WI. (f) Axial CET1WI. Sphenoid

sinus pneumatization reaches the sphenoid-occipital synchondrosis (*arrow*). Excessive pneumatization on the left side (*curved arrows*) pushes the pituitary gland upward and to the right

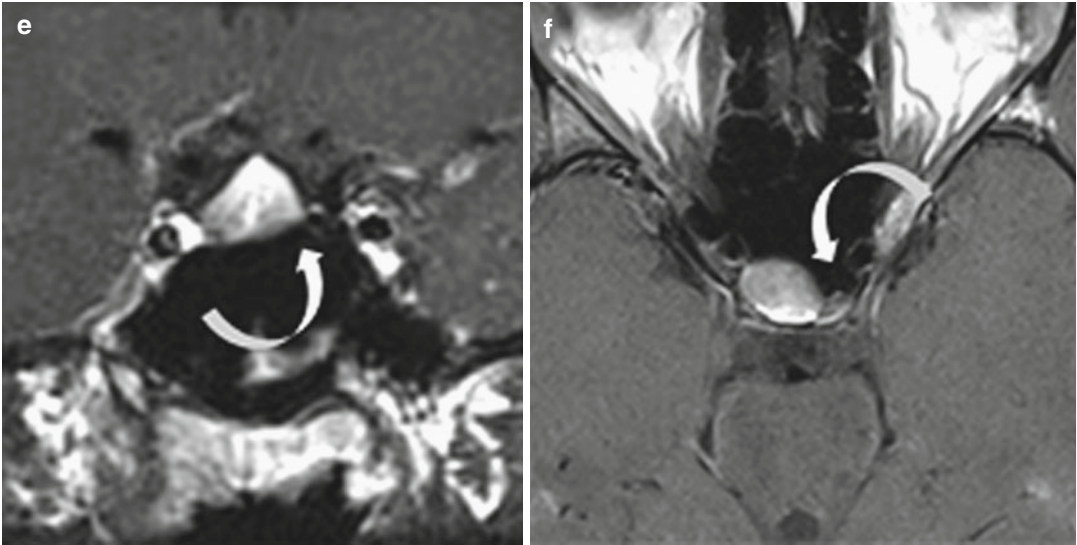


Fig. 3.2 (continued)

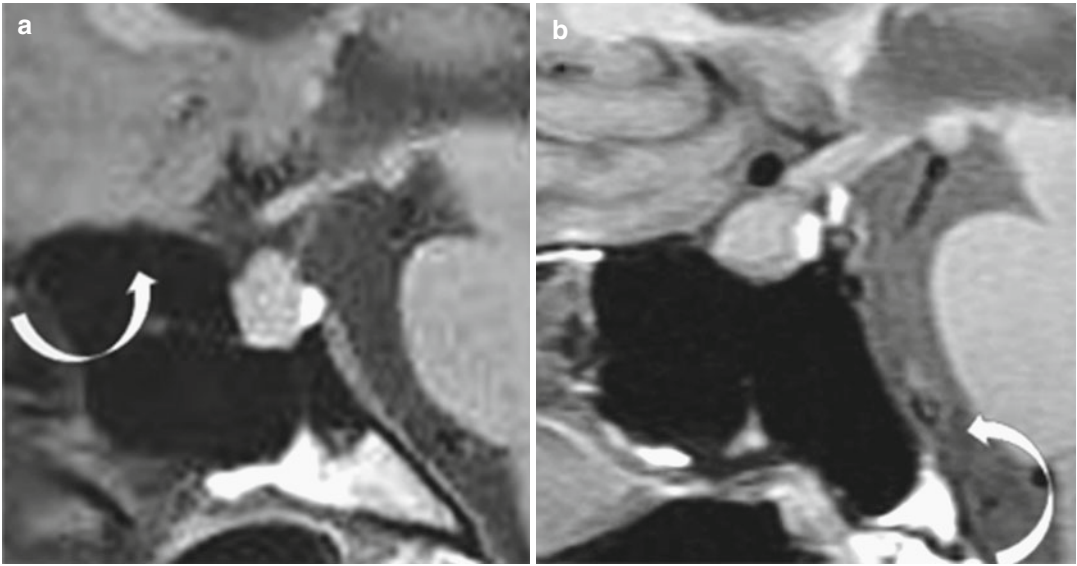


Fig. 3.3 Physiological bulging of the pituitary gland; small sella and hyperpneumatization of the sphenoid sinus. (a, b) Sagittal T1WI. (a) Blistering of the planum sphenoidale (*arrow*). (b) extension of the pneumatization beyond the spheno-occipital synchondrosis (*arrow*)

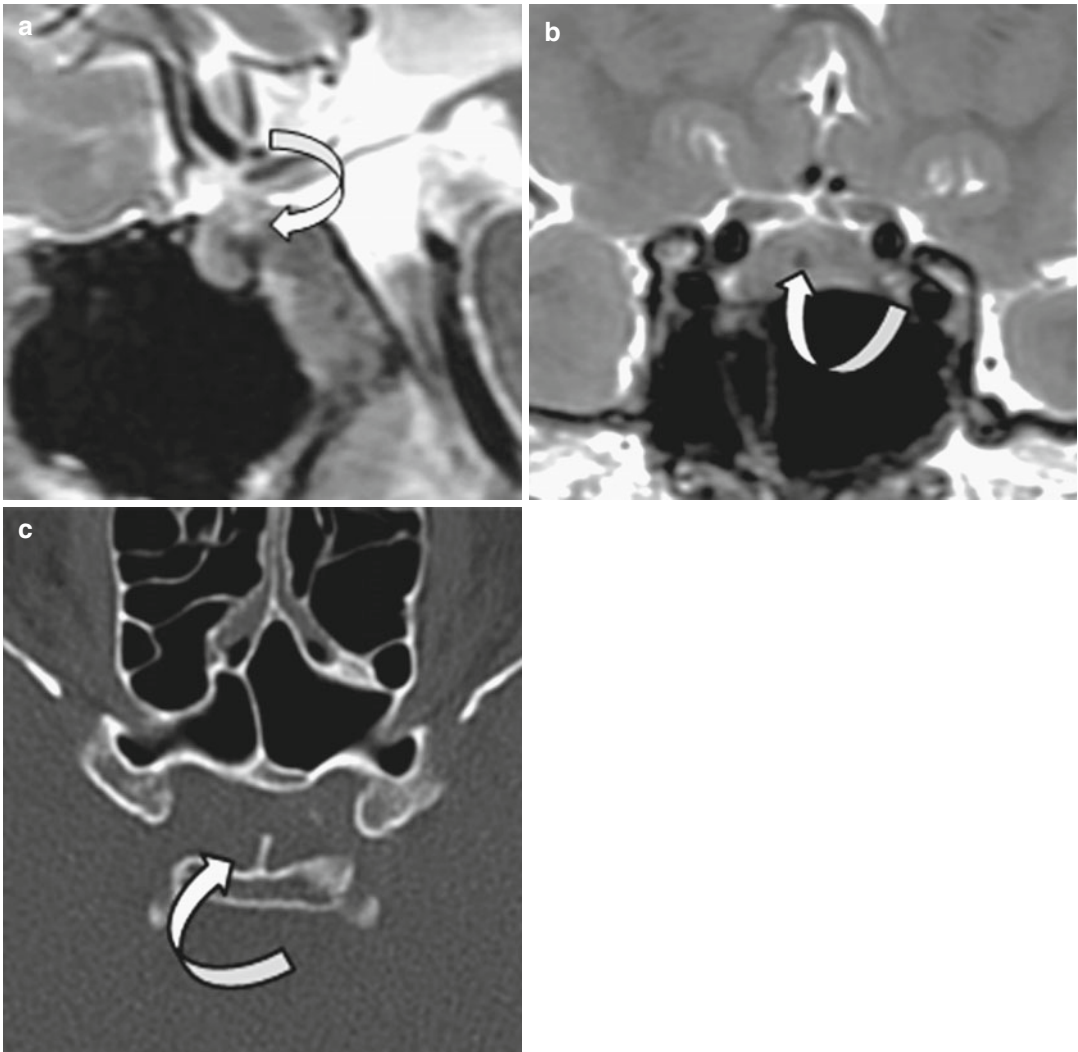


Fig. 3.4 Sellar spine (*arrow*) arising from the dorsum sellae and pushing the pituitary gland upward. (**a, b**) Sagittal and coronal T2WIs. (**c**) Axial CT

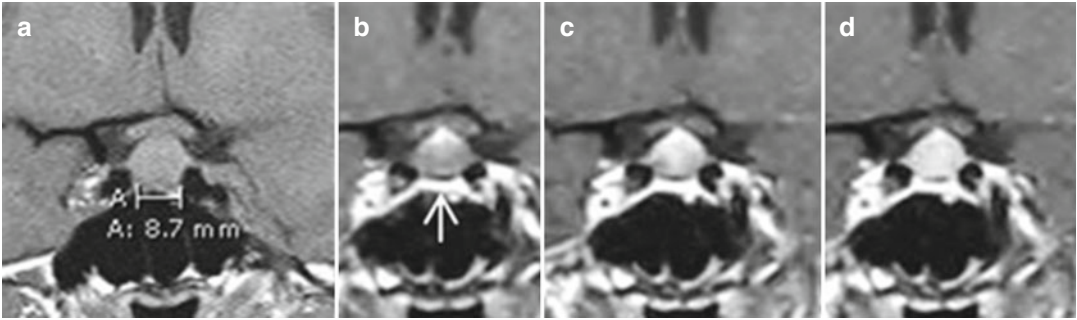


Fig. 3.5 Upward bulging of the upper surface of a normal pituitary gland resulting together from a narrow sellar width (a) coronal T1WI and from an unusual thick infe-

rior coronary sinus, demonstrated with dynamic MRI (b–d) (arrow). Normal enhancement of the pituitary gland

Further Reading

- Bonneville JF (2002) When the pituitary swells up a little. *J Radiol* 83(3):319–320
- Cattin F, Bonneville JF, Tang YS (1990) Diagnostic d'une hypophyse convexe. *Rev Inst Med* 2:221–228