Case 1069

Eurorad

Pituitary sarcoidosis

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Section: Neuroradiology
Imaging Technique: CT
Imaging Technique: MR
Imaging Technique: MR
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Case Type: Clinical Cases
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Patient: 19 years, female

Clinical History:

A 19-year-old female patient with a known systemic disease involving the lungs and peripheral lymph nodes presented with the clinical findings of panhypopituitarism developing over the last two months.
Imaging Findings:

A 19-year-old female patient with a systemic sarcoidosis involving the lungs and peripheral lymph nodes presented with the clinical findings of panhypopituitarism developing over the last two months. Biochemical evaluation of the patient revealed low serum levels of FSH, LH, TSH, thyroid hormones, estrogen hormones. An MRI study has been performed on a 1.5 T MR scanner, with SE T1, FSE T2, post-gadolinium SE T1 weighted and dynamic images of the pituitary gland on coronal and sagittal planes. Treatment with oral corticosteroids produced a moderate improvement in the hormone levels in 8 weeks. Following the treatment a control MRI study was repeated with the same protocol.
Discussion:

Sarcoidosis is a multisystem granulomatous disease, with an unknown etiology. It occurs more commonly in females than in males, it is most commonly seen in between the ages of 20 and 40. The genetically predisposed patients are thought to have an exaggerated cellular immune response to unknown antigens, which leads to noncaseating granuloma formation in sarcoidosis. Sarcoidosis most often involves the lungs, lymph nodes, skin and orbits. Symptomatic central nervous system (CNS) involvement occurs in 5 % of cases, but pathologic CNS involvement is found in up to 25 % of patients at autopsy. The leptomeninges are most often affected, especially the basal cisterns, hypothalamus, optic chiasm and pituitary stalk (infundibulum) in CNS involvement. However any portion of the brain or its appendages may be affected. The diagnosis of sarcoidosis is usually confirmed by histopathological examination, however serum or cerebrospinal fluid angiotensin-converting enzyme (ACE) levels are found to be elevated in approximately 70-80 % of patients with sarcoidosis, hypercalcemia may be found in 2-15 % of the patients due to enhanced sensitivity to vitamin D. The diagnosis of neurosarcoidosis is often difficult, particularly so in patients who lack either pulmonary or systemic manifestations of sarcoidosis. In selected cases with isolated brain involvement, meningeal or cerebral biopsy may be required. Histological examination shows noncaseating granulomata that contain macrophages, epithelioid cells, and multinucleated giant cells. MRI shows a wide range of central nervous abnormalities: hypotalamic-pituitary infiltrating lesions; cerebral parenchymal masses; leptomeningeal lesions; and focal white-matter lesions. On MRI, the lesions are usually isointense to hypointense with cortical gray matter on T1-weighted images, and are variable on T2-weighted images, but often hypointense to gray matter, with marked contrast enhancement following IV gadolinium administration. The patients with

sarcoidosis may rarely present with sellar masses, with the signal characteristics described herein, and marked contrast enhancement. Pituitary adenomas, lymphocytic hypophysitis, idiopathic giant cell hypophysitis, other granulomatous hypophysitis conditions, and meningioma of the diaphragma sellae should be considered in the differential diagnosis of such cases. The choice of treatment is the use of corticosteroids, however alternative treatment (including methotrexate, cyclophosphamide, azathioprin, cyclosporin) can be used in resistant cases.
Differential Diagnosis List: Pituitary sarcoidosis

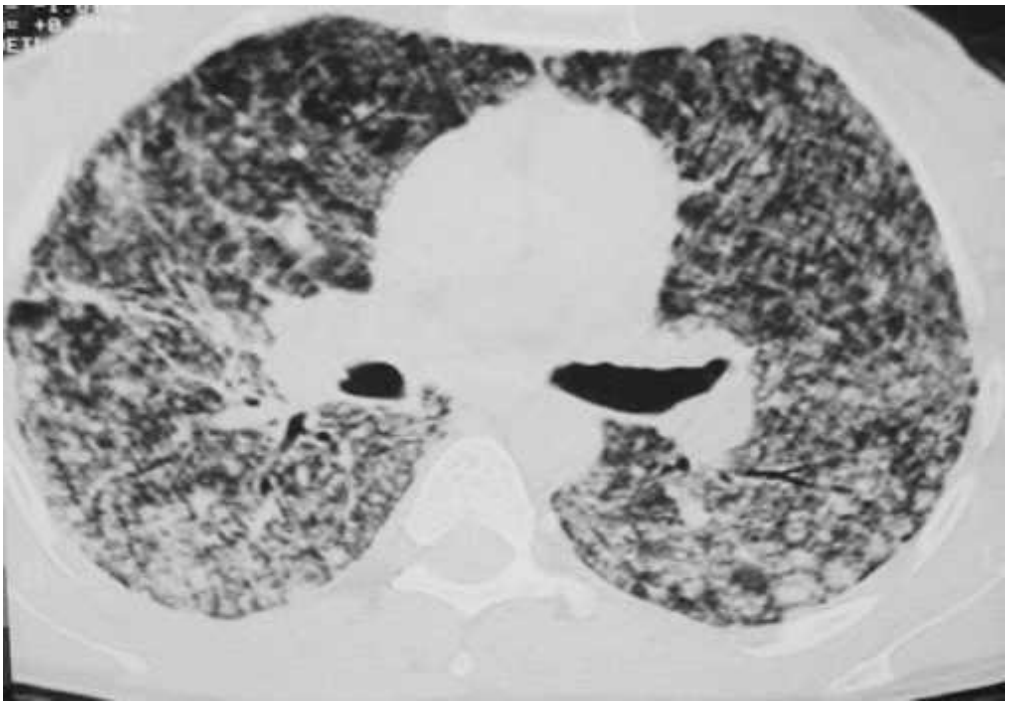
Final Diagnosis: Pituitary sarcoidosis

References:

Pickuth D, Heywang-Kobrunner SH. Neurosarcoidosis: evaluation with MRI.
J Neuroradiol. 2000 Sep;27(3):185-8. (PMID: 11104966)
Zouaoui A, Maillard JC, Dormont D, Chiras J, Marsault C. MRI in neurosarcoidosis. J Neuroradiol. 1992 Dec;19(4):271-84. (PMID: 1464779)
Bullmann C, Faust M, Hoffmann A, Heppner C, Jockenhovel F, Muller-Wieland D, Krone W. Five cases with central diabetes insipidus and hypogonadism as first presentation of neurosarcoidosis. Eur J Endocrinol 2000 Apr;142(4):365-72. (PMID: 10754478)
Guoth MS, Kim J, de Lotbiniere AC, Brines ML. Neurosarcoidosis presenting as hypopituitarism and a cystic pituitary mass. Am J Med Sci 1998 Mar;315(3):220-4. (PMID: 9519939)
Sato N, Sze G, Kim JH. Cystic pituitary mass in neurosarcoidosis. AJNR Am J Neuroradiol 1997 Jun-Jul;18(6):1182-5. (PMID: 9194448)

Figure 1

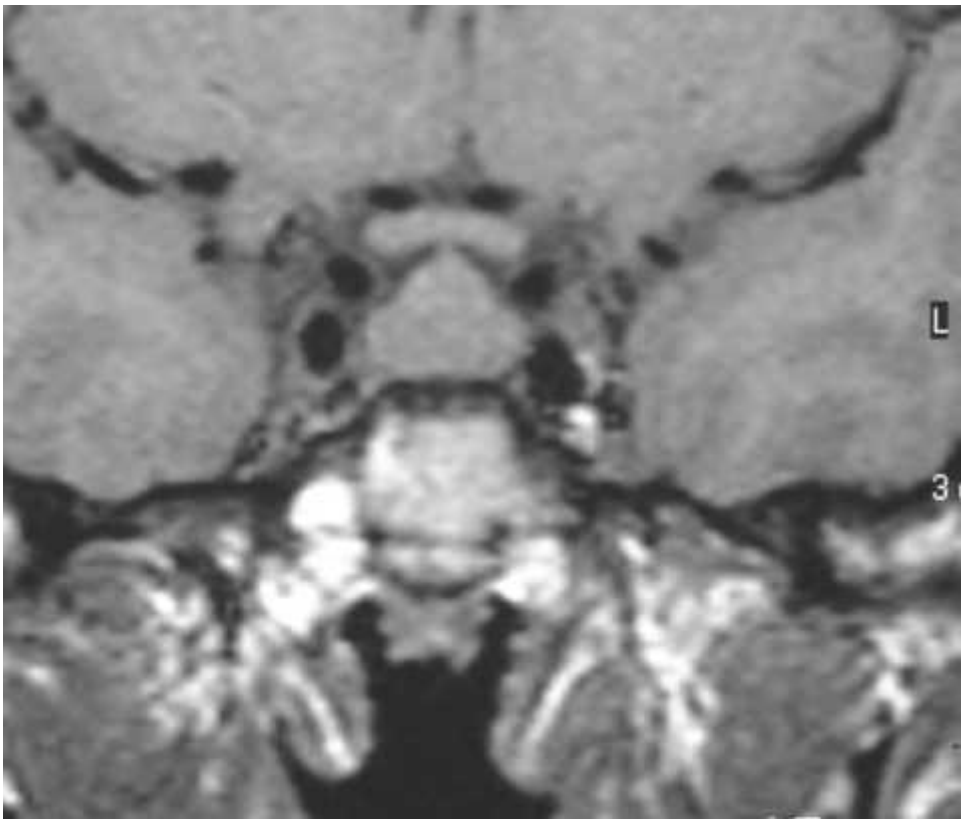
a



Description: Axial computerized tomography of the patient in parenchymal window shows bilateral diffuse reticulonodular involvement of the lungs by sarcoidosis. **Origin:**

Figure 2

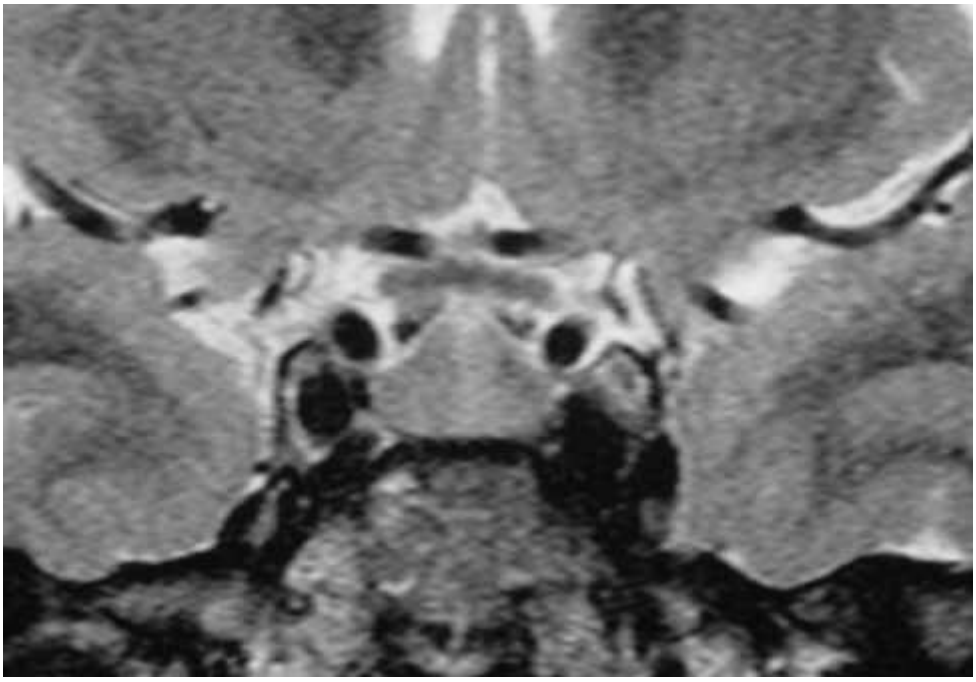
a



Description: Coronal SE T1 weighted MR image shows the enlargement of the pituitary gland, isointense to gray matter, with hyperconvexity of the diaphragma sella; infundibulum is at the midline.

Origin:

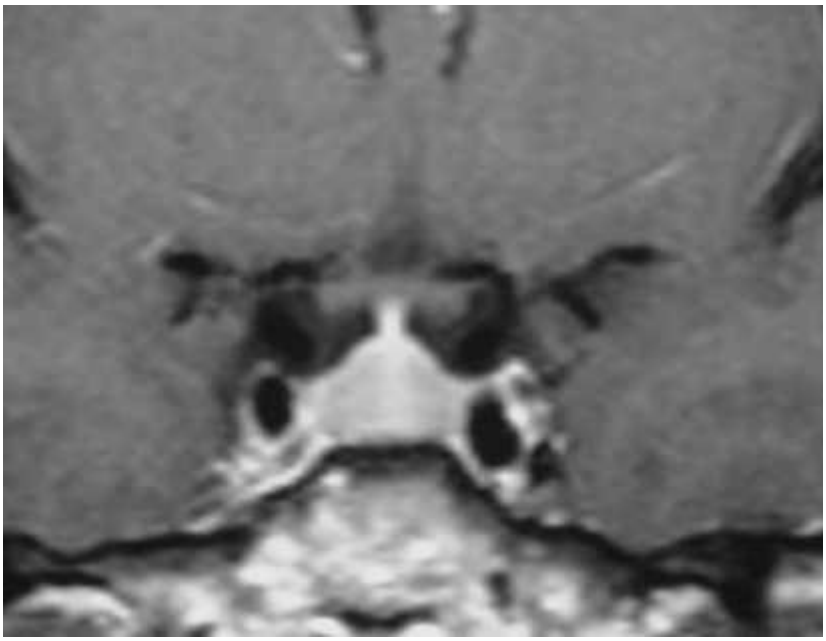
b



Description: Coronal FSE T2 weighted MR image shows enlargement of the pituitary gland, almost isointense to gray matter, with hyperconvexity of the diaphragma sella. **Origin:**

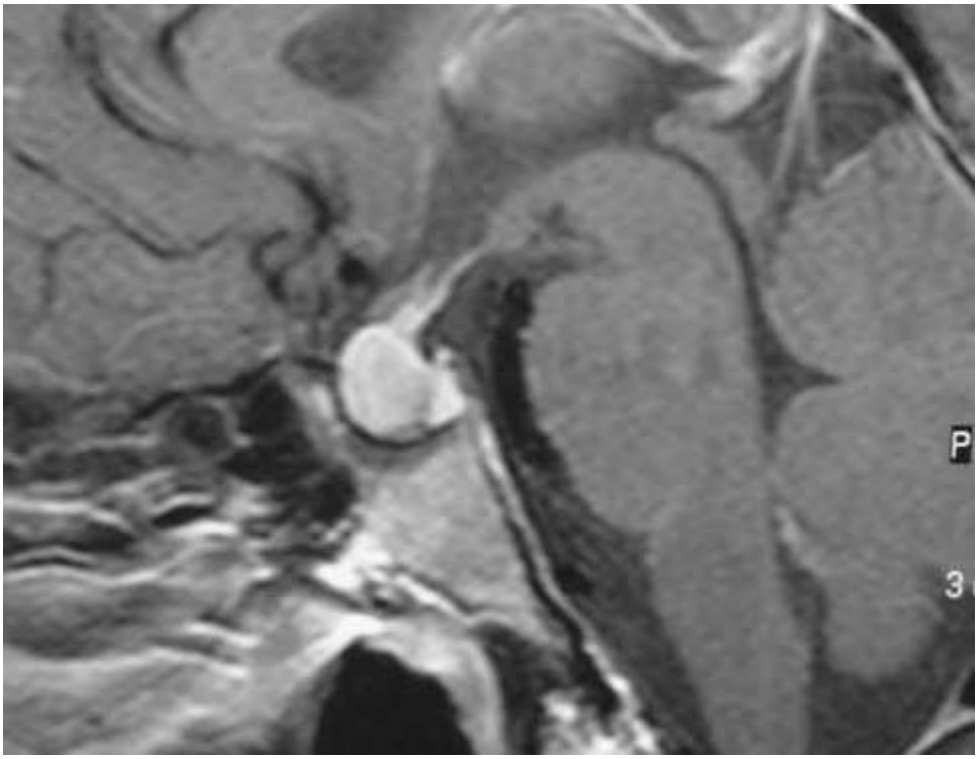
Figure 3

a



Description: Coronal post-gadolinium SE T1 weighted MR image reveals diffuse contrast enhancement of the enlarged pituitary gland, the infundibulum is normal in thickness and contrast enhancement. **Origin:**

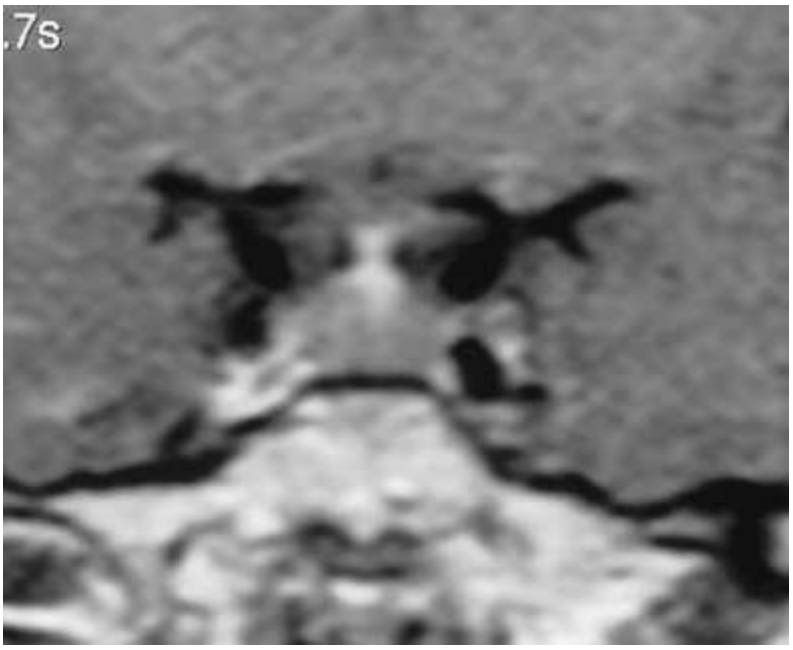
b



Description: Sagittal post-gadolinium SE T1 weighted MR image reveals diffuse contrast enhancement of the enlarged pituitary gland, the infundibulum is normal in thickness and contrast enhancement.
Origin:

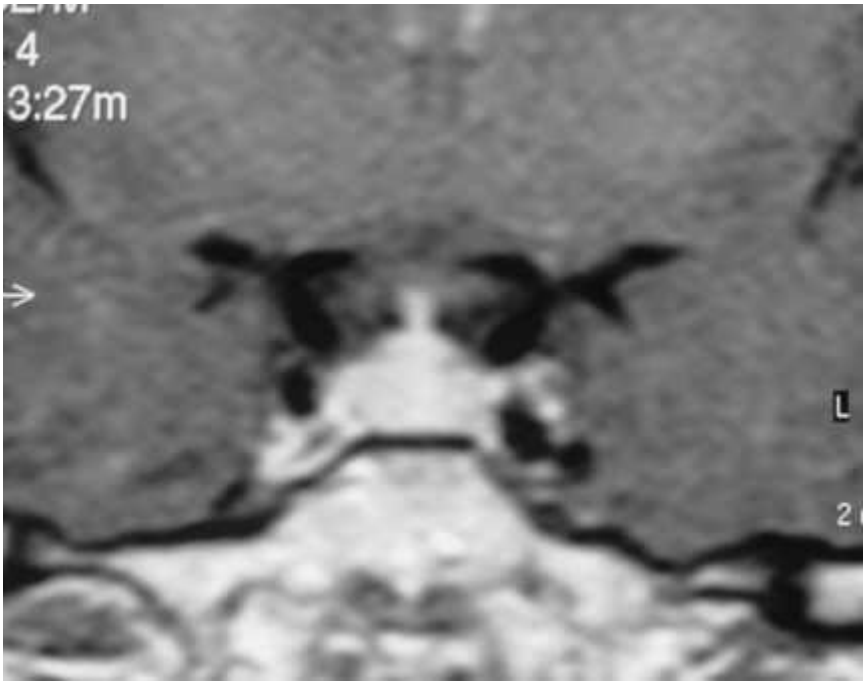
Figure 4

a



Description: Early dynamic coronal MR image shows the contrast enhancement confined only to infundibulum. **Origin:**

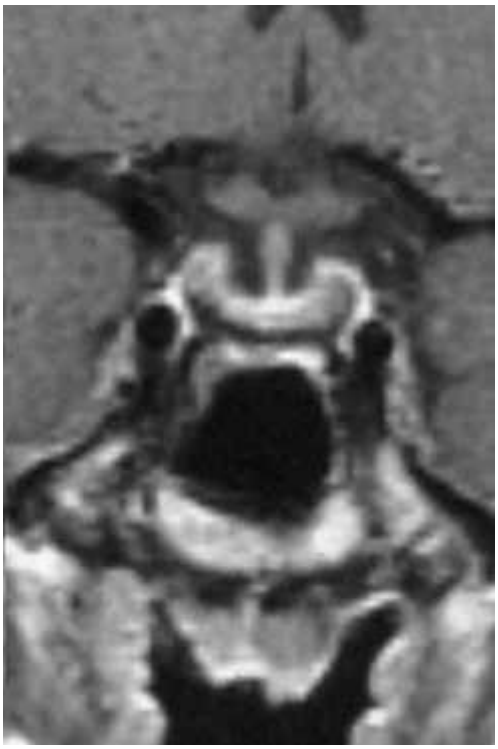
b



Description: Late dynamic coronal MR image shows diffuse contrast enhancement of the enlarged gland. **Origin:**

Figure 5

a



Description: Coronal post-gadolinium SE T1 weighted MR image reveals a normal sized pituitary gland, following 8-weeks-therapy of steroids. **Origin:**