

# An interesting case of cranial diabetes insipidus

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Diabetes Insipidus (DI) is the inability of the kidneys to concentrate urine. This is due to decreased production of Anti-diuretic Hormone (ADH) from the posterior pituitary gland (cranial DI) or decreased tubular sensitivity to ADH (nephrogenic DI) or a mixed picture.

## CASE

- A 53-year-old male presented with several-months history of polyuria and polydipsia. He also had constant thirst and having to get up more than 4 times at night to void urine. He had kept a 24-hour fluid input-output diary which revealed an input of 6000ml and output 7900ml.
- He did not have diabetes mellitus or previous urological ailments. He is a smoker but not on any regular medication. He had no significant findings on physical examination.

## INVESTIGATION

- His serum osmolality was raised (297mOsm/kg) with an inappropriately low urine osmolality (143mOsm/kg).
- He had a low serum testosterone level (5.9nmol/L) in the presence of inappropriately normal Luteinising Hormone and Follicle Stimulating Hormone levels, suggesting hypogonadotropic hypogonadism.
- His prolactin, thyroid and adrenal function tests were normal.
- An MRI scan revealed a large thin-walled complex cyst arising from his hypothalamus (Figure 1, arrows).
- CT (chest, abdomen, pelvis) was normal.

- His visual field assessment was normal.
- A water deprivation test made his serum osmolality rise to 299mOsm/kg but his urine osmolality rose to a maximum of 304mOsm/kg. He felt uncomfortable and since his urine osmolality remained similar over three consecutive readings, he was given DDAVP injection which raised his urine osmolality to 559mOsm/kg (Table 1).

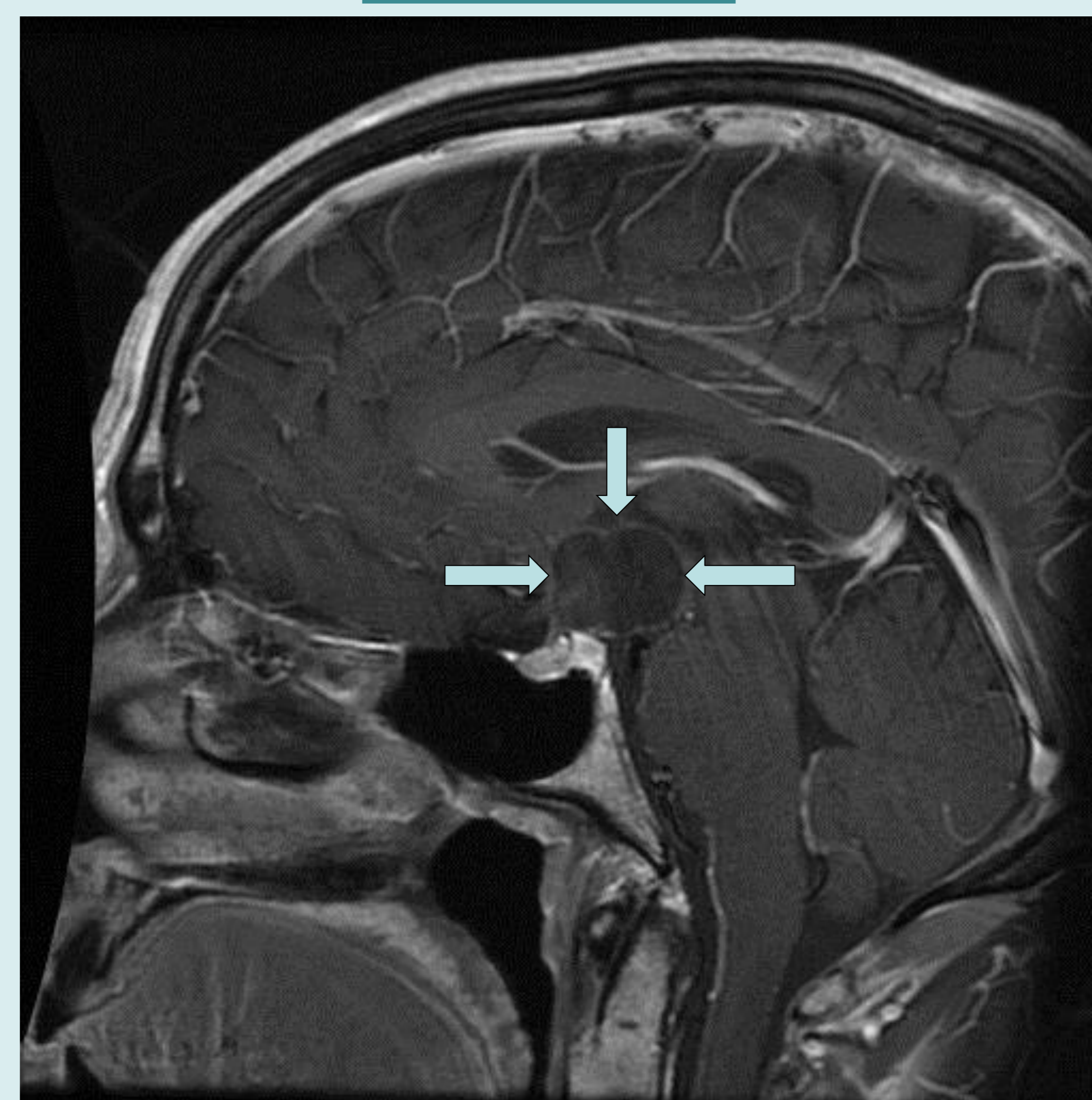
## TREATMENT

- He was started on Desmopressin with appreciable symptomatic improvement.

Table 1 – Results of Water Deprivation Test

| Time  | Urine output (ml) | Body weight (kg) | Urine Osmolality (mOsm/kg) | Serum Osmolality (mOsm/kg)<br>(normal = 280-295) |
|-------|-------------------|------------------|----------------------------|--|
| 08:30 | 118               | 70.9             |                            |  |
| 09:00 |                   |                  |                            | 290  |
| 09:30 | 423               | 70.5             | 115                        |  |
| 10:30 |                   | 69.9             | 146                        |  |
| 11:30 | 398               | 69.5             | 183                        |  |
| 12:00 |                   |                  |                            | 296  |
| 12:30 | 354               | 69.0             | 222                        |  |
| 13:30 | 315               | 68.8             | 281                        |  |
| 14:30 | 225               | 68.5             | 301                        |  |
| 15:00 |                   |                  |                            | 299  |
| 15:30 |                   | 69.8             | 304                        | DDAVP given                                      |
| 16:30 | 68                | 71.0             | 559                        |  |

Figure 1



## OUTCOME AND FOLLOW-UP

The Pituitary MDT concluded that the lesion is likely to be a craniopharyngioma and should be kept under surveillance. The patient remains well on Desmopressin 2 puffs daily, Calcium-vitamin-D and Alendronic acid for osteoporosis and Testosterone replacement.

## CONCLUSIONS

We present a combination of cranial DI and hypogonadotropic hypogonadism secondary to a possible craniopharyngioma. Other causes such as a meningioma, germ cell tumour, epidermoid and dermoid cyst, hypothalamic hamartoma, arachnoid cyst, Rathke cleft cyst, carotid aneurysm, and cavernous haemangioma all make interesting differential diagnoses.

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