

Case series: central diabetes insipidus presenting to a District General Hospital

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Introduction

In a paediatric setting polydipsia is a commonly reported symptom which is usually innocent and habitual in nature.

Diabetes Insipidus (DI) is a rare cause of pathological polydipsia and should be considered in patients with additional symptoms.

We present 3 patients who presented to a District General Hospital within a four year period with subsequent diagnoses of Central DI.

Case A - 12 year old boy

- Presented with a 4 week history of polyuria, polydipsia and poor appetite.
- Paired osmolalities; serum 291 mosm/kg, urine 79 mosm/kg. Water deprivation test was positive but was discontinued due to loss of over 5% body weight (see table 1).
- Further endocrine workup (thyroid function tests, short synacthen test and renal ultrasound) were normal.
- MRI brain revealed absent posterior pituitary and the patient was diagnosed with **isolated cranial DI**. Desmopressin therapy was initiated, the patient's symptoms improved and biochemistry normalised. He continues to have regular surveillance including MRI scans.

Case B - 10 year old boy

- Had a background of previous basal skull fracture following a road traffic accident. Presented to the General Practitioner (GP) with a 5 year history of secondary nocturnal enuresis.
- Medical treatment for nocturnal enuresis (desmopressin) was started by the GP and showed some initial improvement in symptoms. With the return of polydipsia and polyuria he was referred for paediatric assessment.
- Endocrine investigations: paired osmolalities following omission of desmopressin for 3 days revealed serum 285 mosm/kg, urine 46mosm/kg. Thyroid function, short synacthen test and MRI brain were normal. A formal water deprivation test confirmed the diagnosis of **partial cranial DI** and he had excellent clinical and biochemical responses to treatment. He is progressing well through puberty and continues to demonstrate normal wider pituitary function.

Case C - 11 year old boy

- Presented with a 2 month history of polyuria, polydipsia, lethargy and weight loss.
- Endocrine investigations: paired osmolalities showed serum 298 mosm/kg and urine 142mosm/kg. Water deprivation test showed 6.6% weight loss over 4 hours, serum osmolality rose to 300mosm/kg (from 287 mosm/kg) but urine osmolality rose only to 105 mosm/kg from 71 mosm/kg. Thyroid function, early morning cortisol, renal ultrasound were all normal. Initial MRI brain showed absent posterior pituitary but was otherwise normal. A diagnosis of **cranial DI** was made and desmopressin therapy started leading to an improvement in clinical and biochemical parameters.
- Repeat MRI at 6 months was unchanged and repeated testing at 1 year revealed abnormal thyroid function and low IGF-1.
- Repeat MRI head (see figure 1) was performed showing multiple **germ cell tumours**. He was referred to the tertiary oncology team and required treatment with chemotherapy and radiotherapy.

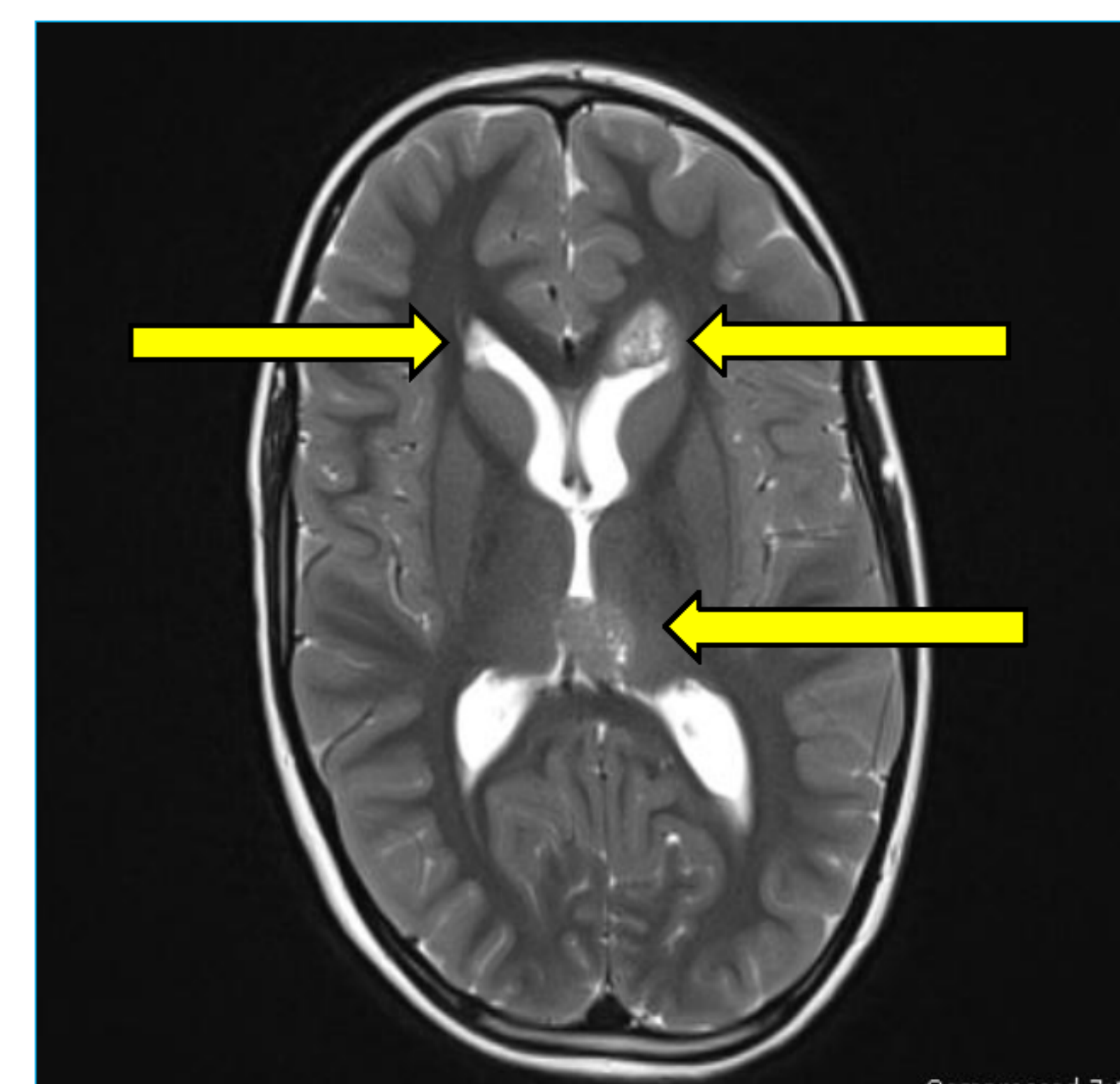


Figure 1: Case C - MRI showing multiple germ cell tumours

Conclusions

Cranial DI is a rare cause of polyuria and polydipsia and yet cases are seen not uncommonly even in non-specialist units. Despite similar clinical presentation in cases A and C and improvement with medication it is very important to continue neuroendocrine investigations and imaging during follow up when the underlying cause is unclear, as a serious aetiology may in due course be demonstrated as in case C.

	Case A		Case B		Case C	
	Initial	Final	Initial	Final	Initial	Final
Sodium (mmol/L)	138	142	142	146	137	146
Serum osmolality (mosm/kg)	285	300	297	307	281	300
Urine osmolality (mosm/kg)	60	105	70	253	71	105
Weight loss (% of body weight)	>5		2.6		6.6	

Table 1: Results of water deprivation test for each case

