

Anxiety Disorder Revealing a Normal Pressure Hydrocephalus: Case Report and CT Findings

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ABSTRACT

Normal pressure hydrocephalus (NPH) describes a constellation of imaging and clinical findings, in particular, with dilated ventricles on imaging, normal CSF pressures on lumbar puncture, it presents with a clinical triad of gait ataxia, dementia and urinary incontinence.

It is considered an idiopathic condition, with the exact pathogenesis still controversial. The incidence of NPH increases with age.

We report the case of a 54-year-old man who presented with recent disabling anxiety and otherwise a minimal change in gait and urinary incontinence, with orienting scanographic findings.

A dramatic response was observed to lumbar puncture, which was followed by ventriculoperitoneal shunt placement.

The CT features in NPH are highly suggestive, but cannot provide a definitive diagnosis. CT must be followed by MRI, CSF pressure measurement and therapeutic tests.

CASE REPORT

INTRODUCTION

Normal pressure hydrocephalus (NPH) is a well described entity in the field of neurosurgery. First described in 1965 [1]. It typically presents with a classic triad of urinary incontinence, gait instability and dementia [2].

In addition, the majority of patients with NPH had at least one psychiatric symptom. Apathy and anxiety were the most common psychiatric symptoms described (25%) [3].

Although the precise cause of NPH is not known, it is considered an idiopathic condition, the exact pathogenesis of which remains controversial [4].

The incidence of NPH increases with age. Imaging findings suggestive of NPH are often encountered in routine practice when imaging the aging population [5].

CASE PRESENTATION

Patient information and clinical findings:

A 54-year-old patient, without any notable pathological history, followed in psychiatry for the management of a behavioral disorder evolving for 3 months, made of cognitive disorder, insomnia, gait imbalance and urinary incontinence but without motor deficit, which was initially considered as an anxiety disorder after confrontation of the patient's social data

(divorce).

The neurological clinical findings no resting tremor, and non-specific imbalance without orienting finding.

In the absence of clinical improvement and in order to eliminate an organ-related cause due to persistence of the symptoms, a non-enhanced cerebral CT scan was initially indicated.

Imaging findings:

- The CT scan had objectified:
- Significant quadri ventricular dilatation with Evans index at 0.39. (axial section) (Figure 1).
- Enlargement of the temporal horns of the lateral ventricles with a maximum diameter of 8 mm (coronal or axial section) (Figure 2).
- Calloso-marginal angle inferior to 90° realizing the aspect of a heart in coronal section (Figure 3).
- Dilatation of the sylvian fissures.

An MRI was then performed, showing in addition to the morphological brain changes described on the CT performed, a change in the CSF flow, without hypersignal T2/FLAIR in periventricular areas.

Follow up:

Spectacular evolution was observed after a first iterative

lumbar puncture, with disappearance of gait abnormality, cognitive disorders then urinary incontinence after 2 weeks, a second iterative lumbar puncture was performed, followed by clinical improvement and discontinuation of the anxyolytic treatment.

The patient benefited 3 month later from ventriculoperitoneal shunt.

As of today 6 months later, the patient has resumed his independent life.

DISCUSSION

The main clinical presentations of NPH are the Adam and Hakim triad, It poses an important diagnostic difficulty in the elderly because of the frequency of dementia and urinary incontinence in the geriatric population [5].

Problems with gait and urinary continence can negatively impact the daily activities of these patients, and impairments in cognitive function, including executive function, attention, and visual-perceptual and visuospatial abilities, can be devastating [6,7].

Patients with NPH had an astheno-emotional disorder characterized by difficulties with concentration, attention, irritability, and memory, as well as emotional instability [3,4].

Imaging in NPH:

• *Scanographic features in NPH*

- Hydrocephalus (ventriculomegaly) with an evans index greater than 0.3.

- Ventriculomegaly includes enlargement of the temporal horns of the lateral ventricles > 6 mm [8].

- Active callosal angle : The callosal angle is measured on a coronal slice perpendicular to the bicommissural line at the posterior commissure [8]. The normal callosal angle, even in global brain atrophy, is 100-120°. In NPH, the callosal angle decreases to 50-80° [8,9].

-Disproportionate subarachnoid spaces [10].

-Cingulate sulcus sign : The cingulate sulcus can be divided into an anterior and a posterior half by a line drawn parallel to the floor of the 4th ventricle.

The NPH cingulate sulcus sign describes a posterior cingulate sulcus that is narrower than the anterior half. This sign can be assessed on a paramedian sagittal plane [8-10].

MRI findings:

• Changes in CSF flow : MR CSF flow studies in NPH shows an increase in peak CSF velocity in the cerebral aqueduct, as well as an increase in CSF volumes in the aqueduct. A subsidiary feature of the increased aqueduct velocity on routine brain MRI is the presence of voids in the CSF flow. Although traditionally considered a useful sign for NPH, they are increasingly seen in normal subjects examined on higher field MRI scanners [1,2,10].

• Changes in brain composition: Periventricular hypoattenuation on CT, or the corresponding high T2/

FLAIR signal on MRI, may be considered a supportive sign for NPH. However, this is a nonspecific feature, as periventricular changes are common in the elderly brain, reflecting chronic microvascular ischemia, or even in the setting of acute hydrocephalus as transependymal edema [5-11].

Principle of treatment:

Tests that assess whether a shunt can improve symptoms, including LP with removal of a large volume of CSF or external CSF drainage, strongly guide the diagnosis and have a therapeutic effect as well [5].

CSF shunting is the gold standard of treatment for patients with PHN, and most patients achieve clinical improvement or resolution of symptoms [6,7,12].

CONCLUSION

Normal-pressure hydrocephalus is a diagnosis to be considered when cognitive disorders are observed in the elderly.

Scanographic features are highly orienting by a range of orienting radiological signs, and encourage further investigations such as MRI and possibly therapeutic tests.

CONFLICT OF INTEREST

No conflict of interest in our manuscript report.

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FIGURES



Figure 1: Axial CT view: Dilatation of lateral ventricle (Evans index: 0,39)



Figure 2: Axial CT view; Enlarged temporal horns (9mm)

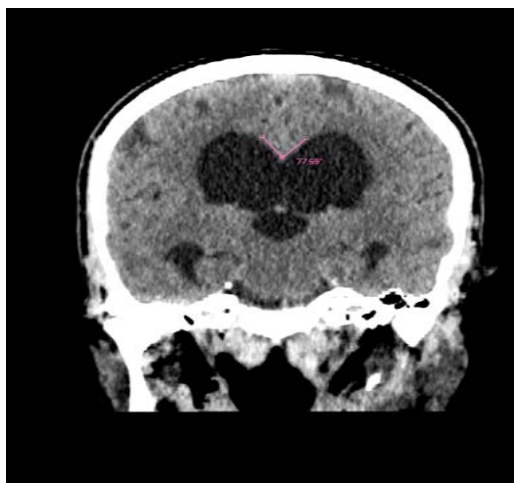


Figure 3: Coronal CT view: Acute Callosal-marginal angle

KEYWORDS

Anxiety; Normal pressure hydrocephalus; CT

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