

## CASE REPORT

# An Analysis of Two Aged Patients with Obstructive Hydrocephalus

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## ABSTRACT

What are the potential factors that should be taken into consideration when evaluating an elderly patient with hydrocephalus detected on their brain CT scan? In this specific case study, we have encounter two separate occurrences of obstructive hydrocephalus. These encounters were marked by a progressive decline in cognitive function and impaired mobility caused by the stiffness in both lower limbs. A conclusive determination of obstructive hydrocephalus was established by relying on their abnormal immunological tests. Subsequently, intracranial drainage tubes were inserted to alleviate the heightened intracranial pressure (ICP). As a result of this intervention, the condition of both patients has shown significant improvement. The authors have acknowledged the potential involvement of an autoimmune mechanism in the development of ependymitis within their ventricular systems. They have also recognized that an early intervention targeting the autoimmune response could potentially slow down the natural progression of this condition.

**Keywords:** Obstructive hydrocephalus; Drainage therapy; Autoimmune mechanism; Rheumatism

## 1. Introduction

Two instances of obstructive hydrocephalus were observed in a 79-year-old woman and an 80-year-old man, respectively. Both patients presented with a gradual decline in mental faculties and walking difficulties, which were attributed to the stiffness expe-

rienced in their legs over the course of several years. Additionally, both individuals exhibited vitiligo or scleroderma on their skin, along with concurrent rheumatic diseases.

Following the completion of immunological tests, the presence of a positive autoimmune antibody or an abnormal lymphocyte subset was identified. Addi-

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tionally, a distinct “ventricular enlargement” was observed in their cerebrums as a result of the narrowing of the midbrain aqueduct (ependymitis). To address this condition, two drainage tubes were surgically inserted into their cerebral ventricles, allowing for the drainage of cerebrospinal fluid (C.S.F.) into their abdominal cavities. This intervention effectively relieved the intracranial pressure on the brain tissue, leading to an improvement in the condition of both patients.

## 2. Case report

### 2.1 General material

**Case 1:** The hospital received a 79-year-old female patient, who had previously resided in a nursing home. This patient, who had retired from her profession as an accountant, had been transferred to our facility one year ago. Interestingly, during her youth, she had pursued a career as a Shaoxing Opera actress. However, as she entered her thirties, she transitioned into the field of finance and became a “financial accountant”. The patient experienced “Vitiligo”, (an autoimmune skin condition) on her facial area, resulting in a significant impact on her physical appearance. Starting at the age of 56, she started to encounter a decline in cognitive abilities, characterized by memory impairment, decreased speech, and a peculiar sucking reflex reminiscent of an infant. There was no previous record of any brain injury or bleeding within the skull. Subsequently, she experienced a progressive rise in muscle stiffness in her lower extremities (rigidity), accompanied by sporadic episodes of seizures.

On the evening of her admission, she strolled through the ward accompanied by a caregiver. Unexpectedly, she experienced a sudden “backward fall” which was subsequently identified as an “epileptic seizure”. Further examination of her brain CT scan revealed the presence of “Hydrocephalus”, which was responsible for the occurrence of epileptic seizures. Additionally, immunological analysis confirmed the presence of a positive Ro-52 antibody. Consequently, based on the presented evidence, a

diagnosis of “Obstructive Hydrocephalus” caused by ependymal adhesion was established.

**Case 2:** A male patient, aged 80, who had previously worked as an office employee, was admitted to our medical facility due to his complaint of a progressive decline in cognitive abilities over the course of the last 8 years. The patient has encountered challenges in ambulation due to instability, leading to recurrent falls. Furthermore, the individual possesses a medical background characterized by experiencing numerous fractures. He has lodged a grievance concerning the occurrence of low back pain resulting from a compressive fracture. It is worth mentioning that his daughter has refuted any instances of brain trauma or stroke in his medical history. Notably, a hydrocephalus condition was detected in his brain CT scan approximately one year ago. As a result, an intracranial placement of a drainage tube was performed to drain Cerebrospinal Fluid (C.S.F.) into the abdominal cavity for decompression. Despite experiencing low back pain, there was no previous medical record of arthritis or dermatitis. A “Mask Face” was observed, along with the presence of “vitiligo” on his torso. The skin on his hands exhibited hypertrophy, accompanied by scleroderma-like alterations on both of his ankles. The pulmonary CT scan revealed the presence of lung nodules and interstitial lesions, while the brain CT scan showed multiple “low density” lesions. Immunological tests indicated the presence of ANA 1:100 (+) and an abnormal lymphocyte subset. Consequently, a clinical diagnosis of obstructive hydrocephalus caused by ependymal lesions, triggered by rheumatic diseases, was established.

## Discussion

The clinical features of the two patients were outlined as follows:

Both individuals were elderly and had no previous record of brain trauma or stroke.

The individuals in both cases had a medical background involving a condition known as “skin disease”. In **Case 1**, the patient exhibited a noticeable “vitiligo” on her forehead, accompanied by a positive Ro-52 antibody.

Both individuals exhibited symptoms of “obstructive hydrocephalus”, cognitive decline, and lower limb rigidity. Additionally, they had experienced instances of “falling down” in their medical records.

The patient in **Case 1** in this case also had a medical background of “epileptic seizures”. Consequently, drainage tubes were surgically placed into the ventricles of the cerebrum, leading to a notable improvement in the overall condition of the patient.

In order to investigate the cause of “hydrocephalus”, we examined the presence of “Ependymitis” resulting from rheumatism, (an autoimmune attack to the endothelium of ventricular system) → narrowing the aqueduct of midbrain → elevation in intracranial pressure (ICP) → compression of brainstem → Parkinson-like symptoms (stiffness of lower limbs) → resulting in individuals being prone to falls. This process expedites the progression of cognitive decline (Dressman & Elyaman, 2022)<sup>[1]</sup>.

In the field of geriatric practices, it is evident that young physicians lack understanding and experience of “rheumatic and immunological knowledge” and remain oblivious to the potential ramifications. In the first case study, approximately one year prior to the patient admission, the attending doctor observed indications of “Ventricular Enlargement” in the patient; however, they were unable to identify the underlying cause of the symptoms. Conversely, in the second case, the doctor neglected to perform an initial immunological evaluation upon the patient’s admission.

When examining the attributes of rheumatic activity in the brain, the primary target is the white matter (myeloid sheath cells) (Hanly, 2014)<sup>[2]</sup>, presenting “multiple low-density foci” on brain CT. Nevertheless, the limbs of these individuals exhibit unrestricted mobility, indicating the presence of an imaging and clinical dissociation. The appearance of “low-density foci” on brain CT scans is often misconstrued as “Arterial Ischemic Infarction” by medical practitioners, leading to occasional recurrence of

these misinterpretations. Furthermore, the alterations in the “low-density focus” prior to and subsequent to the evaluation frequently demonstrate the movement and reversibility of foci, indicating the distinctive characteristics of “neurological rheumatism” within the central nervous system (McGinley et al., 2021)<sup>[3]</sup>. These features, reminiscent of the imaging findings in multiple sclerosis (MS), should serve as a cautionary signal for junior doctors.

## Conclusions

We have concluded that an autoimmune mechanism could potentially contribute to the development of ependymitis within the ventricular systems, resulting in obstructive hydrocephalus. To enhance the effectiveness of treatment, it is recommended to administer immune interventions at an earlier stage to elderly patients with abnormal immunological findings, in addition to implementing traditional cerebrospinal fluid drainage therapy during the later stages of the condition.

## Conflict of Interest

There is no conflict of interest.

## References

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