

# Acute Urinary Retention after Brainstem Infarction

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## OBJECTIVE

We herein report a case of acute urinary retention after acute ischemic stroke of brainstem.

## MATERIAL AND METHODS

A 64-year-old man had acute onset of diplopia after coronary angiography. The initial computed tomography showed no intracranial hemorrhage and latter magnetic resonance image showed recent infarction at left paramedian of lower midbrain. On the second day, he experienced acute deterioration of consciousness. The computed tomography showed a hemorrhagic transformation and intraventricular hemorrhage in the fourth ventricle. At the same time, (Acute urinary retention, AUR) occurred and an indwelling urethral catheter was inserted.

## RESULTS

He then gradually improved from the acute episode. One month after the onset, his diplopia improved but still didn't completely resolve. (Trial of without catheter, TOWC) was first tried, whereas the (post-void residual volume, PVR) was still up to 766 ml. Another TOWC still failed on the second month. On the third month, his diplopia resolved completely. And he could void well after the catheter was removed, and only a minimal PVR volume was measured.

## CONCLUSION

(Pontine micturition center, PMC) in the rostral pons is adjacent to the lesion site of this case; it could be vulnerable to the ischemic injury or the latter sequence of ischemia. Clinicians should recognize that AUR could be an early sequence in stroke involving PMC pathway.

## BRIEF HISTORY

A 64-year-old man had acute onset of diplopia after coronary angiography. Neurologic examination revealed limited extra-ocular movement of the left eye. There was no other neurologic sign. Initial computed tomography showed no intracranial hemorrhage. He was treated as acute ischemic stroke and was on aspirin and enoxaparin. Subsequent magnetic resonance image showed recent infarction at left paramedian of lower midbrain (Fig 1, Left). On the second day, he experienced acute deterioration of consciousness (Glasgow Coma Scale decreased from E3V5M6 to E1VeM1). The computed tomography showed a hemorrhagic transformation and intraventricular hemor-

rhage in the fourth ventricle (Fig 1, Right). Meanwhile, (acute urinary retention, AUR) developed and an indwelling urethral catheter was inserted.

He then gradually improved from the acute episode. One month after the onset, his diplopia improved but still didn't completely resolve. (Trial of without catheter, TOWC) was first tried, whereas the (post-void residual volume, PVR) was still up to 766 mL (Fig 2, Left). Another TOWC failed on the second month, though the neurological deficit was improving. On the third month, his diplopia resolved completely. He could void well after the catheter was removed, and only a minimal PVR volume was measured (Fig 2, Right).

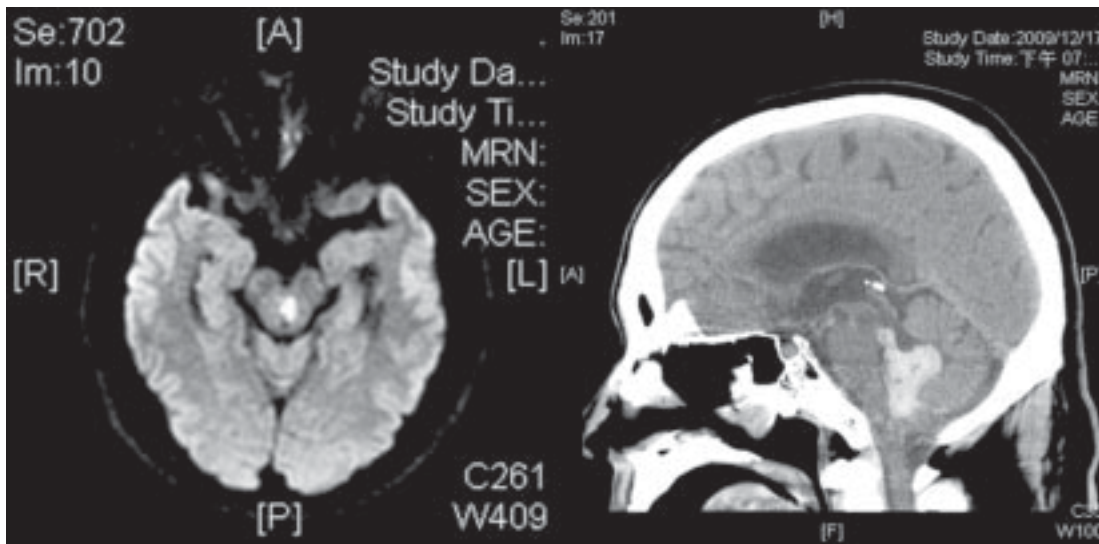
## DISCUSSION

In the literature, the relationship between brainstem stroke and voiding dysfunction has been rarely described. Wu et al. [1] reported a 45-year-old man who had acute left medial pontine infarction presenting with dysarthria and right-side hemiparesis. Two days after the onset, AUR developed along the clinical progression of the stroke. A serial urodynamic follow-up was performed and clearly demonstrated the transformation from the initial detrusor hyporeflexia to later regain of bladder contractility. The authors made a conclusion that AUR in this case might result from disruption of the descending pathway of the (pontine micturition center, PMC). We also notice that there are recently two other case reports describing AUR as the initial [2] or an isolated [3] presentation of an ischemic stroke of brainstem, and both were ascribed to PMC dysfunction based on the neuroanatomical relevance. In our case, because PMC (in the rostral pons) is adjacent to the lesion site (left lower paramedian midbrain), it could be vulnerable to the ischemic injury or the consequence of ischemia (e.g. edema). Moreover, it was also possible that the PMC function was interfered by the late occurring hematoma in the fourth ventricle. Taken together, these case reports suggest that the voiding dysfunction in stroke is worth a more complete urologic evaluation (e.g. urodynamic studies). Meanwhile, clinicians should recognize that AUR could be an early sequence in stroke patients. Timely diagnosis and appropriate bladder management are mandatory to avoid urological complications.

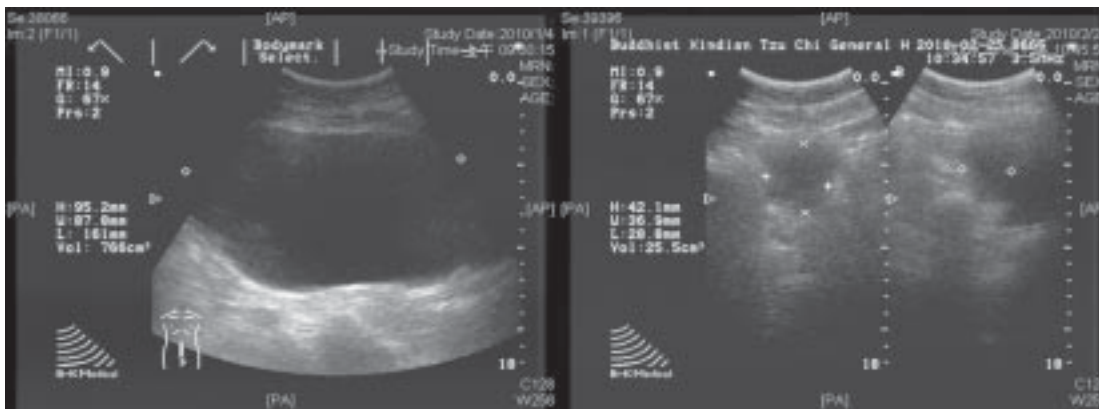
## REFERENCES

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**Fig. 1.** (Left) Diffusion-weighted magnetic resonance imaging shows hyperintensity over the left paramedian of lower midbrain. (Right) Computed tomography shows intracranial hematoma in the fourth ventricle.



**Fig. 2.** (Left) A PVR volume of 766 ml one month after the stroke. (Right) A minimal PVR volume three months after the stroke.