A 52-year-old female, a known case of hypertension, presented with sudden episodes of fall without loss of consciousness. These episodes lasted for brief periods followed by full neurological recovery. The frequency of such drop attacks was 1-2 per day. It was associated with giddiness. Neurological examination was normal apart from mild hyperreflexia in all four limbs.

Twenty-four-hour electroencephalography (EEG) was done by a neurologist which was normal. Electromyography (EMG) and nerve conduction velocity (NCV) of all four limbs were also normal. Cardiovascular workup which included echocardiograms (ECG) and Holter monitoring were normal. Magnetic resonance imaging (MRI) revealed anterolaterally placed, homogenously enhancing dural based lesion in the foramen magnum encasing the left vertebral artery suggestive of meningioma (Figures I(a), I(b), and I(c)).

Patient underwent surgery by posterior approach. Total excision of the tumor followed by augmentation duraplasty was performed via midline suboccipital craniectomy and removal of C1 arch. Tumor was arising from anterolateral dura of foramen magnum, firm in consistency, vascular, and nonsuckable. It was excised in piecemeal, baring the left vertebral artery and left posterior inferior cerebellar arteries (PICA). Complete excision was done with coagulation of dural base.

Patient had a dramatic recovery from her symptoms postoperatively. At follow-up of 18 months after the surgery patient is disease-free (Figures I(d) and I(e)).

Histopathological examination showed the lesion to be meningothelial meningioma (Figure 2).
Figure 1: (a) T2 weighted sagittal image; (b) postcontrast T1 weighted sagittal image; (c) postcontrast T1 weighted axial image: magnetic resonance imaging (MRI) showing anterolaterally placed, homogenously enhancing dural based lesion in the foramen magnum encasing the left vertebral artery suggestive of meningioma. (d) T1 weighted sagittal image and (e) T1 weighted axial image: postoperative MRI showing complete excision of tumor.

Figure 2: Photomicrograph (H& E, 10x) showing lobular arrangement of meningotheial cells with syncytial distribution at the periphery suggestive of meningotheial meningioma.

The causes of sudden onset falls can be divided into two categories: with and without loss of consciousness.

| Sudden onset fall [2]                                      |
|-----------------------------------------------------------|
| With loss of consciousness                               |
| Syncope                                                   |
| Metabolic conditions                                      |
| Epilepsy                                                  |
| Intoxications                                             |
| Cataplexy                                                 |
| Drop attack                                               |
| Psychogenic syncope                                       |
| TIA                                                       |
| Without loss of consciousness                             |

Syncope is defined as a transient, self-limited loss of consciousness, usually leading to fall. The onset of syncope is relatively rapid, and the subsequent recovery is spontaneous, complete, and usually prompt. The underlying mechanism is a transient global cerebral hypoperfusion. The causes due to syncope or nonsyncopeal conditions like metabolic disorders including hypoglycaemia, hypoxia, epilepsy, and intoxications. Falls without loss of consciousness can be due to cataplexy, drop attacks, psychogenic "syncope" (somatization disorders), and transient ischaemic attacks (Figure 3).
of syncope include neurally mediated reflex syncopal syndromes, cardiac arrhythmias, orthostatic hypotension, and cerebrovascular conditions [8].

Drop attacks are sudden falls without loss of consciousness that are not precipitated by a specific stimulus, occur with abrupt onset and without warning, and are followed by a rapid return to baseline. A range of localizations for drop attacks is possible, but most commonly lower brainstem or spinal cord structures are implicated. Drop attacks generally indicate transient impairment of bilateral central nervous system structures involved in maintenance of postural muscle tone and balance [9]. Tumarkin otolithic catastrophes (or crises) are drop attacks without associated autonomic or neurologic symptoms in patients with severe vestibular disorders like vertebrobasilar insufficiency. Drop attacks due to vertebrobasilar insufficiency are commonly accompanied by other event-related neurologic manifestations (e.g., visual loss, diplopia, vertigo, and numbness) in addition to the sudden loss of postural tone in the legs [14]. Therefore ECG, EEG and relevant investigations should be done in the patients presenting with episodic falls.

Foramen magnum (FM) is bounded anteriorly by lower third of the clivus and upper edge of the body of C2, laterally by jugular tubercles and upper aspect of C2 laminas, posteriorly by anterior edge of the squamous occipital bone and C2 spinous process.

Meningiomas of Foramen magnum represent around 3% of all meningiomas and 1% of all primary brain tumors. These represent 70% of all tumors in that region. The lesion is often large at diagnosis because of their slow-growing rate, long interval since the first symptom, and the wide subarachnoid space at this level [1, 15]. These present with occipitocervical pain, long tract signs, and lower cranial nerve deficits [2, 3]. Meningiomas in the foramen magnum frequently elude early diagnosis because their ill-defined symptoms mimic cervical spondylosis, multiple sclerosis, syringomyelia, normal pressure hydrocephalus, amyotrophic lateral sclerosis, Chiari I malformation, carpal tunnel syndrome, and intramedullary or extramedullary tumors [16]. Meningioma of the foramen magnum when unrecognised may lead to progressive myelopathy with quadriplegia, dysphagia, and sphincter disturbance [17].

### 4. Conclusion

Foramen magnum meningioma may rarely present with drop attacks and should be considered in the differential diagnosis of the conditions causing drop attacks. Magnetic resonance imaging (MRI) may clinch the organic causes of drop attacks and help in early diagnosis of foramen magnum meningioma. It should be included in the diagnostic workup of patients presenting with drop attacks.

### Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.
References

[1] K. I. Arnautović, O. Al-Mefty, and M. Husain, “Ventral foramen magnum meningiomas,” *Journal of Neurosurgery*, vol. 92, no. 1, pp. 71–80, 2000.

[2] S. K. Gupta, B. S. Sharma, V. K. Khosla, S. N. Mathuriya, A. Pathak, and M. K. Tewari, “Far lateral approach for foramen magnum lesions,” *Neurologia Medico-Chirurgica*, vol. 40, no. 1, pp. 48–52, 2000.

[3] A. Nanda, D. A. Vincent, P. S. S. V. Vannemreddy, M. K. Baskaya, and A. Chanda, “Far-lateral approach to intradural lesions of the foramen magnum without resection of the occipital condyle,” *Journal of Neurosurgery*, vol. 96, no. 2, pp. 302–309, 2002.

[4] G. R. Criscuolo and L. Symon, “Intraventricular meningioma. A review of 10 cases of the National Hospital, Queen Square (1974–1985) with reference to the literature,” *Acta Neurochirurgica*, vol. 83, no. 3–4, pp. 83–91, 1986.

[5] M. S. Lee, Y. C. Choi, J. H. Heo, and I. S. Choi, “‘Drop attacks’ with stiffening of the right leg associated with posterior fossa arachnoid cyst,” *Movement Disorders*, vol. 9, no. 3, pp. 377–378, 1994.

[6] B. George and C. Laurian, “Impairment of vertebral artery flow caused by extrinsic lesions,” *Neurosurgery*, vol. 24, no. 2, pp. 206–214, 1989.

[7] I. F. Pollack, N. F. Schor, A. J. Martinez, and R. Towbin, “Bobble-head doll syndrome and drop attacks in a child with a cystic choroid plexus papilloma of the third ventricle. Case report,” *Journal of Neurosurgery*, vol. 83, no. 4, pp. 729–732, 1995.

[8] M. Bringole, P. Alboni, D. Benditt et al., “Task Force on Syncope, European Society of Cardiology. Part 1. The initial evaluation of patients with syncope,” *Europace*, vol. 3, no. 4, pp. 253–260, 2001.

[9] R. S. Maurice-Williams, “Drop attacks from cervical cord compression,” *British Journal of Clinical Practice*, vol. 28, no. 6, pp. 215–216, 1974.

[10] A. Tumarkin, “The otolithic catastrophe: a new syndrome,” *British Medical Journal*, vol. 2, no. 3942, pp. 175–177, 1936.

[11] M. Kameyama, “Vertigo and drop attack. With special reference to cerebrovascular disorders and atherosclerosis of the vertebral-basilarsystem,” *Geriatrics*, vol. 20, no. 11, pp. 892–900, 1965.

[12] U. Kramer and A. Achiron, “Drop attacks induced by hypothyroidism,” *Acta Neurologica Scandinavica*, vol. 88, no. 6, pp. 410–411, 1993.

[13] B. George, D. Bresson, and M. Bruneau, “Extrinsic compression of the vertebral artery,” in *Pathology and Surgery around the Vertebral Artery*, B. George, M. Bruneau, and R. F. Spetzler, Eds., chapter 20, pp. 273–283, Springer, Paris, France, 2011.

[14] J. C. M. Brust, C. R. Plank, E. B. Healton, and G. F. Sanchez, “The pathology of drop attacks: a case report,” *Neurology*, vol. 29, no. 6, pp. 786–790, 1979.

[15] M. Bruneau and B. George, “Foramen magnum meningiomas: detailed surgical approaches and technical aspects at Lariboisière Hospital and review of the literature,” *Neurosurgical Review*, vol. 31, no. 1, pp. 19–32, 2008.

[16] F. B. Meyer, M. J. Ebersold, and D. F. Reese, “Benign tumors of the foramen magnum,” *Journal of Neurosurgery*, vol. 61, no. 1, pp. 136–142, 1984.

[17] W. J. Levy Jr., J. Bay, and D. Dohn, “Spinal cord meningioma,” *Journal of Neurosurgery*, vol. 57, no. 6, pp. 804–812, 1982.