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MORGAGNI-STEWART-MOREL SYNDROME PRESENTING AS ACUTE NEUROLOGICAL AND RESPIRATORY DISTRESS

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ABSTRACT

Background: Morgagni-Stewart-Morel syndrome (MSMS) is an uncommon disorder characterized by internal frontal hyperostosis, obesity, neuropsychiatric symptoms, and often associated endocrine abnormalities, notably hypothyroidism. Acute presentations are rare and can pose diagnostic challenges, especially in the prehospital setting. We describe a rare acute presentation of Morgagni-Stewart-Morel syndrome (MSM) involving neurological deterioration and respiratory failure, highlight the importance of early recognition and multidisciplinary management in improving outcomes.

Case presentation: A 62-year-old woman presented with sudden-onset severe neurological impairment accompanied by acute respiratory distress, initially identified by prehospital emergency medical services. Prompt airway management, including endotracheal intubation and mechanical ventilation, enabled stabilization and urgent transfer to hospital care. Neuroimaging revealed characteristic internal frontal bone thickening, confirming the diagnosis of MSMS. A multidisciplinary approach targeting the neurological, endocrine, and respiratory components led to progressive clinical improvement and a favourable recovery.

Conclusion: This case underscores the critical importance of early recognition of MSMS in acute, life-threatening presentations. Awareness of this rare syndrome among prehospital and emergency clinicians can facilitate timely intervention and improve patient outcomes.

KEYWORDS

Morgagni-Stewart-Morel syndrome, internal frontal hyperostosis, hypothyroidism, respiratory distress

LEARNING POINTS

- Morgagni-Stewart-Morel syndrome can exceptionally present with acute neurological and respiratory compromise, not just chronic neuropsychiatric symptoms. The presence of internal frontal hyperostosis, even if incidental, should prompt evaluation for underlying endocrine and neurological dysfunction.
- Timely airway management and correction of hormonal imbalances are essential to survival and recovery.
- Multidisciplinary collaboration is crucial in managing complex cases of Morgagni-Stewart-Morel syndrome, especially in acute settings where diagnosis is challenging.

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INTRODUCTION

Morgagni-Stewart-Morel (MSM) syndrome is a rare condition defined by the presence of hyperostosis frontalis interna (HFI), a benign thickening of the inner table of the frontal bone, typically identified on neuroimaging. Although often asymptomatic, HFI can be associated with a spectrum of neuropsychiatric, endocrine, and metabolic disturbances, including headache, mood and cognitive disorders, obesity, hirsutism, and glucose metabolism abnormalities[1-3]. The exact pathophysiology remains uncertain, but hormonal and metabolic factors are thought to play a central role in its development[2]. MSM syndrome remains underrecognized in clinical practice, partly due to the non-specific nature of its symptoms and the fact that HFI is frequently an incidental finding[4]

Early recognition of MSM syndrome is crucial but remains a significant challenge, especially in prehospital settings, where diagnostic tools are limited, and the presentation is often non-specific. The symptoms can mimic more common neurological or psychiatric disorders, increasing the risk of misdiagnosis and delayed management[5]. The limited awareness of MSM syndrome among healthcare professionals, particularly in acute care environments, further contributes to prolonged diagnostic uncertainty and inappropriate care pathways.

In this context, we report a rare case of suspected MSM syndrome in the prehospital setting, highlighting the importance of clinical vigilance when faced with atypical neurological or behavioural presentations and underscoring the potential role of prehospital providers in the early identification and appropriate referral for this rare but impactful disorder.

CASE DESCRIPTION

A 62-year-old woman with a past medical history of epilepsy (managed with antiepileptic medication), hypothyroidism (on L-thyroxine), hirsutism, and prolonged immobility secondary to joint ankylosis was evaluated by the prehospital medical team for sudden-onset altered consciousness associated with dyspnoea. The patient had recently initiated antiviral therapy for herpes zoster.

On initial assessment, the patient's airway was at risk. She presented with respiratory distress characterized by bradypnea at 8 breaths per minute, oxygen desaturation to 60%, and cyanosis. Pulmonary auscultation revealed no abnormal breath sounds. Hemodynamically, she was stable with a blood pressure of 110/60 mmHg and a heart rate of 100 bpm, without peripheral signs of shock. Neurological assessment revealed an unconscious patient with a Glasgow Coma Scale score of 6/15, no sensory or motor deficits, normally reactive pupils, and no generalized tonic-clonic movements or signs suggestive of seizures. Capillary blood glucose measurement was within normal limits. On exposure, there was no skin rash, no signs of trauma or intoxication, no tongue bite, and no urinary incontinence. The diagnoses considered were meningoencephalitis, non-convulsive status epilepticus, and central vascular causes.

Given the combination of neurological impairment and respiratory distress, the decision was made to proceed with endotracheal intubation and mechanical ventilation, followed by urgent transfer to the hospital for further management.

Initial laboratory investigations revealed hypocalcaemia (serum calcium 2.03 mmol/l), markedly elevated C-reactive protein at 270 mg/l. Arterial blood gas analysis demonstrated respiratory acidosis. An urgent lumbar puncture was carried out and showed no abnormalities. Thyroid function testing showed a significantly elevated thyroid-stimulating hormone, consistent with poorly controlled hypothyroidism due to non-adherence to L-thyroxine therapy.

Cerebral imaging, including a non-contrast computed tomography scan, demonstrated diffuse thickening of the skull vault without evidence of osteolytic lesions or acute cerebrovascular events. Further evaluation with brain magnetic resonance imaging confirmed the presence of internal frontal hyperostosis and cortico-subcortical brain atrophy. In light of the constellation of clinical, biochemical, and radiological findings, a diagnosis of MSM syndrome was established.

Hospital management included resumption of thyroid hormone replacement therapy (L-thyroxine), correction of respiratory acidosis and electrolyte imbalance (hypocalcaemia), continuation of antiviral therapy, and close neurological monitoring. Over the following days, the patient exhibited progressive neurological recovery and improvement in respiratory function. The patient was discharged following recovery to her baseline clinical status.

DISCUSSION

MSM syndrome is an infrequently encountered and often overlooked disorder involving thickening of the internal frontal bone combined with a diverse array of neurological, endocrine, and metabolic abnormalities. Initially documented in the early 1900s, it predominantly affects women, particularly in postmenopausal period, and is frequently associated with obesity and hormonal imbalances such as hypothyroidism or oestrogen deficiency[1,6-8].

Due to its broad and non-specific symptomatology, MSM syndrome remains a diagnostic challenge, especially in emergency or prehospital contexts. Typical presentations may include headaches, mood fluctuations, memory issues, seizures, hirsutism, or features of metabolic syndrome[5,9]. Because these signs are common to a range of conditions, MSM syndrome is rarely suspected at first presentation, especially in the acute setting.

In this case, the patient was found in severe neurological distress coupled with respiratory insufficiency, prompting urgent airway intervention. These acute symptoms revealed a more systemic pathology, ultimately diagnosed as MSM syndrome following appropriate investigations.

Hypothyroidism likely played a central role in the development of hypoventilation, through both central

nervous system depression and reduced respiratory muscle performance, contributing to respiratory acidosis. Profound hypothyroidism is known to cause altered consciousness, slowed metabolism, and muscle weakness, sometimes progressing toward myxoedema coma if untreated[10,11].

The hallmark finding in this case—HFI—is considered a defining imaging feature of MSM syndrome. Though often asymptomatic, it has been associated with cognitive impairment, behavioural changes, and psychiatric disturbances. Some hypotheses suggest that this bony overgrowth could affect cortical function or intracranial dynamics, although the exact mechanism remains unclear[2,5].

The patient's prior history of epilepsy added complexity to the clinical interpretation. Seizure activity is reported in some cases of MSM syndrome, but in this instance, no convulsions were noted, and the reduced consciousness was more plausibly explained by the metabolic and respiratory decompensation.

The role of the prehospital team was essential in this case. Prompt recognition of life-threatening signs, combined with rapid airway management, helped prevent further deterioration. This underscores the importance of prehospital awareness of atypical multisystem presentations, especially in older patients with multiple comorbidities.

Treatment for MSM syndrome is supportive and multidisciplinary, targeting the underlying endocrine disorders, neurological symptoms, and metabolic imbalances. In this patient, thyroid hormone replacement, electrolyte correction, and respiratory stabilization led to a gradual but marked improvement. This illustrates how acute decompensations in MSM syndrome may be reversible with appropriate and timely care.

Few reports describe MSM syndrome in prehospital or acute emergency contexts, making this case particularly noteworthy. While most literature focuses on chronic cognitive or behavioural effects, our report shows that life-threatening presentations are possible and may be the initial manifestation of the syndrome. Timely diagnosis relies on the combination of clinical vigilance, neuroimaging findings, and appropriate metabolic and endocrine workup. In the acute setting, as demonstrated here, early airway management and hemodynamic stabilization are essential to patient survival, while addressing the underlying hormonal imbalance remains the cornerstone of definitive care. This case highlights the necessity for prehospital providers, emergency physicians, neurologists, endocrinologists, and intensive care specialists to collaborate in managing such complex presentations to optimize outcomes[12].

Although the pathophysiological mechanisms linking internal skull thickening to neurological symptoms are not fully understood, emerging evidence suggests that brain atrophy, subtle intracranial hypertension, or altered cortical function may contribute to the clinical picture of MSM syndrome[11,13]. Therefore, recognition of MSM syndrome should not be limited to incidental imaging findings but must be integrated into the broader clinical context.

Finally, this case reinforces the value of a multidisciplinary, patient-centred approach, addressing both the acute manifestations and the chronic management of endocrine and neurological comorbidities. Prompt correction of endocrine imbalances, combined with supportive neurological and respiratory care, is essential to achieving a favourable prognosis and preventing recurrence.

Given the scarcity of literature on acute critical presentations of MSM syndrome, especially in prehospital care, this report adds to the growing understanding of this rare but potentially serious syndrome and underscores the need for greater awareness and clinical preparedness.

Ultimately, the case supports the value of a coordinated, multidisciplinary approach, involving endocrinologists, neurologists, pulmonologists, and critical care teams, to ensure comprehensive management of this rare but complex syndrome.

CONCLUSION

This case highlights a presentation of MSM syndrome with acute neurological deterioration and respiratory failure, emphasizing the need to consider this rare condition beyond its usual chronic manifestations. The coexistence of multisystem involvement, severe endocrine dysfunction, and HFI should raise clinical suspicion, even in emergency settings. Rapid management of metabolic and respiratory disturbances within a multidisciplinary approach is crucial to improve patient outcomes. This rare presentation underscores the importance of maintaining awareness of atypical cases of MSM syndrome, particularly in critical situations where diagnosis may be delayed.

REFERENCES

1. Topaloğlu Ö, Bayraktaroğlu T, Tekin S, Topaloğlu SN, Şahin İ, Cantürk Z. Hyperostosis frontalis interna. *Turk J Endocrinol Metab* 2022;**26**:213–216. doi: 10.5152/tjem.2022.22037
2. Çetinok H. Hyperostosis frontalis interna and its clinical significance. *Acta Med Nicomedia* 2025;**8**:169–175. doi: 10.53446/actamednicomedia.1644183
3. She R, Szakacs J. Hyperostosis frontalis interna: case report and review of literature. *Ann Clin Lab Sci* 2004;**34**:206-208.
4. Nguyen AH, Moore M, Hunter III W. Hyperostosis of the frontal,temporal, and sphenoid bones: Case report and review of literature. *Int J Anat Res* 2015;**3**:817-820. doi: 10.16965/ijar.2014.485
5. Tosunoğlu B, Ergin N, Kaya N, Ertuğrul İnan L. Morgagni-Stewart-Morel syndrome presenting with neurological symptoms: a case report. *J Yeungnam Med Sci* 2023;**40**:308-310. doi: 10.12701/jyms.2022.00675
6. Alvarez L, Corrigan W, McGonegal C, Leon J, Avila D, Kane F, et al. The clinical manifestations of hyperostosis frontalis interna: A qualitative systematic review of cases. *Clin Anat* 2024;**37**:505-521. doi: 10.1002/ca.24147
7. Stiene JM, Frank PW. Hyperostosis Frontalis Interna and a Question on Its Pathology: A Case Report. *Am J Case Rep* 2022;**23**:e937450. doi: 10.12659/AJCR.937450
8. Verdy M, Guimond J, Fauteux P, Aube M. Prevalence of hyperostosis frontalis interna in relation to body weight. *Am J Clin Nutr* 1978;**31**:2002-4. doi: 10.1093/ajcn/31.11.2002
9. Elghazouani F. Schizophrenia and Hyperostosis Frontalis Interna with History of Head Injury. *Case Rep Med* 2021;**2021**:6634640. doi: 10.1155/2021/6634640
10. Wartofsky L, Burman KD. Alterations in thyroid function in patients with systemic illness: the "euthyroid sick syndrome". *Endocr Rev* 1982;**3**:164-217. doi: 10.1210/edrv-3-2-164
11. Attanasio F, Granziera S, Giantin V, Manzato E. Full penetrance of Morgagni-Stewart-Morel syndrome in a 75-year-old woman: case report and review of the literature. *J Clin Endocrinol Metab* 2013;**98**:453-457. doi: 10.1210/jc.2012-3242
12. Dagytė G, Mančinskaja S, Krasauskienė J. Managing Hashimoto's Encephalopathy: A Case Report. *Cureus* 2025;**17**:e80467. doi: 10.7759/cureus.80467
13. Li Y, Wang X, Li Y. Hyperostosis Frontalis Interna in a Child With Severe Traumatic Brain Injury. *Child Neurol Open* 2017;**4**:2329048X17700556. doi: 10.1177/2329048X17700556