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Case Report

CASE REPORT

Cheiro-oral-pedal syndrome as the presenting symptom of brainstem cavernous malformation: a case report

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Abstract

The rare cheiro-oral-pedal syndrome (COPS) is characterized by sensory disturbances around the corner of the mouth, and in the hand and foot of the same side. The causative lesion is located in the thalamocortical projections, thalamus or brainstem and is usually due to ischemic or hemorrhagic stroke. We report a case of a patient with brain stem cavernous malformations presented as pure COPS with additional sensory disturbance in the thorax. We report this case to raise awareness of these very rare syndromes and demonstrate that mildly presenting symptoms can be caused by an underlying devastating condition.

INTRODUCTION

Cavernous malformations (CMs) are clusters of abnormal blood vessels lined with endothelial cells that do not exhibit intervening tight junctions, lack muscular and elastic layers and are filled with blood at varying degrees of thrombosis. The incidence of cerebral CMs ranges from 0.4 to 0.8%; they comprise 10–15% of all vascular malformations in the central nervous system [1]. CMs present in a sporadic typically single-lesion form and a familial form, which usually has multiple lesions, comprises 30–50% of cases, and are caused by an autosomal dominant mutation in one of the *CCM1*, *CCM2* or *CCM3* genes [2]. Patients with brainstem CMs can present with a broad range of symptoms including cranial nerve deficit, hemiparesis and hemisensory loss, but asymptomatic lesions are found in 20–50% of all CMs [3]. We report a rare case of brainstem CMs presented with pure cheiro-oral-pedal syndrome (COPS).

CASE REPORT

A 56-year-old man presented with an abnormal tingling sensation around the right side corner of the mouth, and in the hand, foot and lateral thoracic region (Fig. 1). He had a history of dyslipidemia and anxiety disorder, for which he was taking simvastatin and escitalopram. His body temperature was 36.7°C, his pulse was 90 bpm, and his blood pressure was 128/86 mmHg. Neurologic examination revealed that the patient was alert, his cranial nerves were intact, his motor power was grade V in all extremities, and his deep tendon reflexes were normal. Objective sensory deficit was not seen. We suspected COPS with additional thorax involvement. COPS is usually due to a lesion in the thalamocortical projections or thalamus and brainstem. The differential diagnosis of COPS in this patient included lacunar infarction because he had a risk factor for dyslipidemia, hemorrhagic stroke or cerebral vascular malformations such as CMs,

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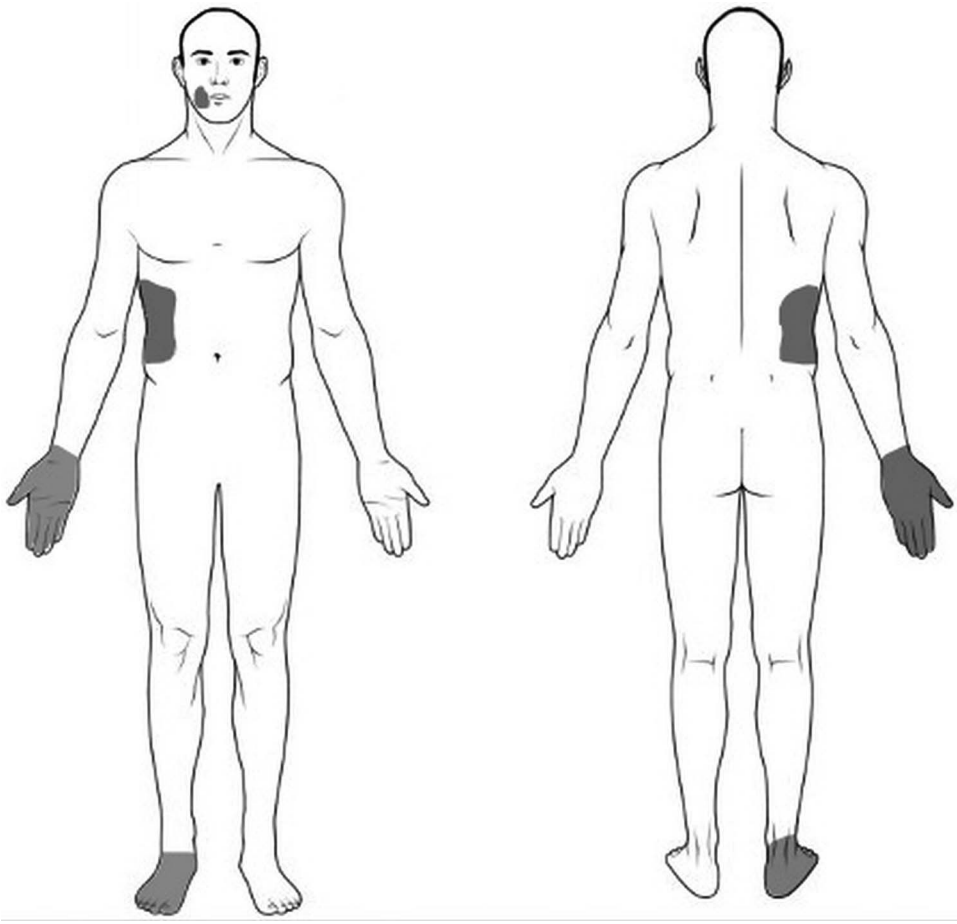

Figure 1: The patient had paresthesia around the corner of the right side of the mouth, and in the hand, foot and lateral thoracic region of the same side.

and arteriovenous malformations were also possible differential diagnosis.

Brain magnetic resonance imaging (MRI) showed a well-defined lesion in the left side of the dorsal pons, measuring 1.2 × 1.1 cm and showing T1 hyperintensity without enhancement, T2 hyperintensity with a hemosiderin rim and surrounding edema, and an associated blooming susceptibility artifact on susceptibility weighted imaging (SWI), and was diagnosed with a bleeding CM (Fig. 2). Because his symptoms did not disturb his quality of life and the lesion was located in the deep pons, where the morbidity associated with the intervention is high. Observation was considered and gabapentin was prescribed at 300 mg/day. His sensory symptom was gradually decreased, and he had only mild tingling sensation with no additional symptoms after the 16-week follow-up period.

DISCUSSION

COPS is characterized by sensory disturbances around the corner of the mouth, and in the hand and foot of the same side. COPS was first described in patients with midbrain and pontine hemorrhagic stroke [4]. A further report documented unilateral sensory disturbances in the thoracic region, in addition to the hand, mouth and foot regions due to lesions in the thalamus and thalamocortical projections; additional symptoms included headache, diplopia and/or hemiparesis [5]. Our patient presented with very rare COPS with thoracic region involvement without additional symptoms. COPS could be explained by partial involvement of the medial lemniscus, thalamus or thalamocortical projections. In the medial lemniscus in the pons, the closeness of the sensory fibers from the head, arm, trunk and leg can be explained by COPS with thoracic involvement in our patient [6]. Our patient was high risk of misdiagnosis because he presented with unfamiliar sensory symptoms without other abnormal symptoms along with a history of anxiety disorder.

Brainstem CMs account for 20–35% of all CMs and have higher incidence rates of hemorrhaging and re-hemorrhaging than non-brainstem CMs (2.8 vs. 0.3%, and 32.3% vs. 6.3% per patient-year, respectively) and a low mortality rate of 2.2% [2]. The risk factors of CMs hemorrhaging include young age, female sex, prior hemorrhage and a deep location [7].

MRI is the diagnostic modality of choice, especially SWI sequences and gradient echo sequences that demonstrate the area of prior hemorrhage [8]. Brain MRI of our patient showed hyperintensities on both T1-and T2 weighted sequences and an associated blooming susceptibility artifact on SWI sequence due to their subacute hemorrhage.

Management options include observation or surgery: surgical resection, radiosurgery or stereotactic laser ablation. Observation may be preferred despite a lesion being symptomatic if the intervention risk is high, such as with deeply located CMs. Postoperative brainstem CMs morbidity occurred in 34.8% including motor deficits, sensory deficits, tracheostomy/gastrostomy requirement and other cranial nerve deficits [9]. If repeated hemorrhages lead to progressive neurological morbidity, surgery

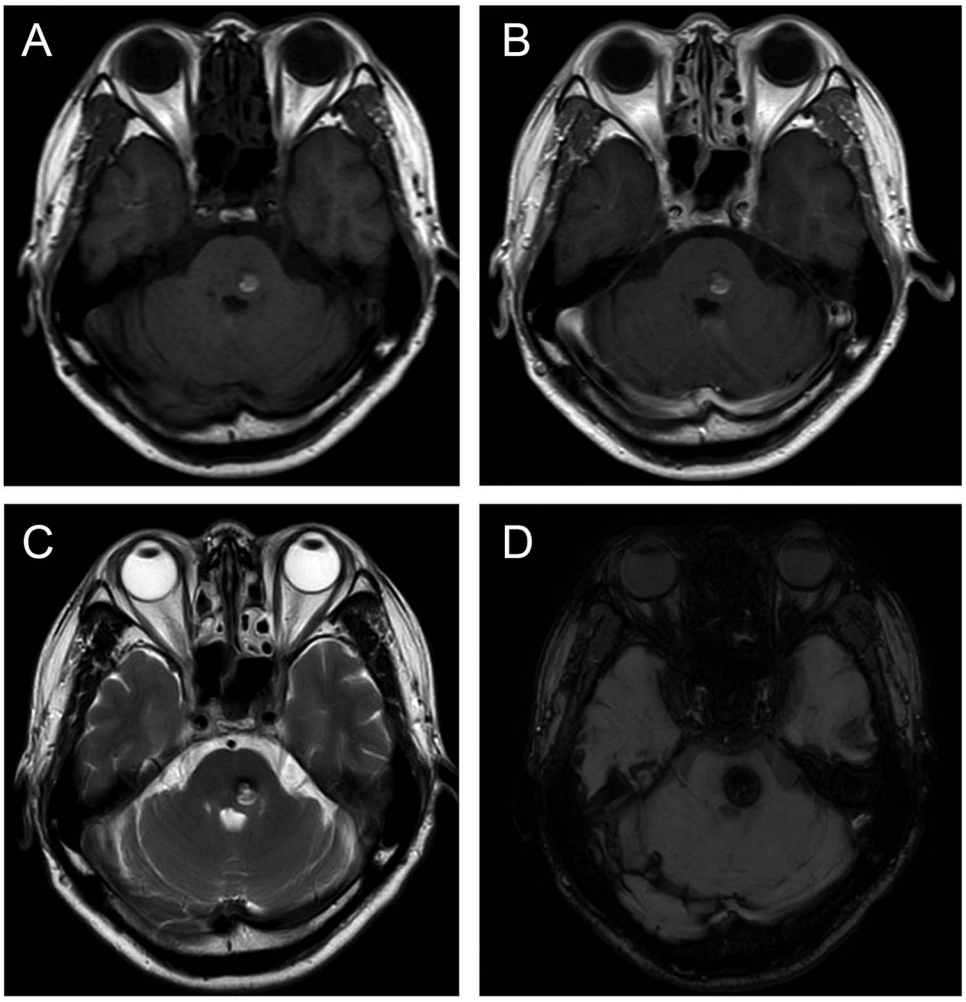

Figure 2: MRI. (**A**) Axial T1-weighted images, (**B**) Axial T1-weighted image with gadolinium, (**C**) Axial T2-weighted images, (**D**) Axial SWI. Brain MRI showed a well-defined lesion in the left side of the dorsal pons, measuring 1.2 × 1.1 cm and showing T1 hyperintensity without enhancement, T2 hyperintensity with a hemosiderin rim and surrounding edema, and an associated blooming susceptibility artifact on SWI.

may be considered. In our patient, observation was considered because he had only sensory symptoms. and the lesion was located in the deep pons, where the morbidity associated with the intervention is high.

We report this case of brainstem CMs presented with isolated COPS with additional thorax involvement to raise awareness of these very rare syndromes. We consider COPS an underreported condition because the mild sensory symptoms can be easily misdiagnosed by a physician, and the patients may not be concerned about their symptoms, which are linked to serious conditions. The occurrence of COPS as a presentation of neurological disease should be investigated in neurological patients, especially stroke patients, to raise awareness and prevent misdiagnosis of serious conditions.

ACKNOWLEDGEMENTS

Not applicable.

CONFLICT OF INTEREST STATEMENT

None declared.

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ETHICAL APPROVAL

This study was approved by the Prapokklao Hospital Ethics Committee. The committee's reference number is CTIREC018.

CONSENT

The patient gave written informed consent before data collection.

GUARANTOR

Chumpol Anamnart.

REFERENCES

1. Taslimi S, Modabbernia A, Amin-Hanjani S, Barker FG II, Macdonald RL. Natural history of cavernous malformation:

systematic review and meta-analysis of 25 studies. *Neurology* 2016;**86**:1984–91. doi: 10.1010/WNL.0000000000002701.
2. Stapleton CJ, Barker FG II. Cranial cavernous malformations: natural history and treatment. *Stroke* 2018;**49**:1029–35. doi: 10.1161/STROKEAHA.117.017074.
3. Hauck EF, Barnett SL, White JA, Samson D. Symptomatic brainstem cavernomas. *Neurosurgery* 2009;**64**:61–71. doi: 10.1227/01.NEU.0000335158.11692.53.
4. Yasuda Y, Morita T, Okada T, Seko S, Akiguchi I, Kimura J. Cheiro-oral-pedal syndrome. *Eur Neurol* 1992;**32**:106–8.
5. Yaduda Y, Watanabe T, Tanaka H, Akiguchi I, Kimura J, Kameyama M. Unusual sensory disturbance in the thoracic region after stroke relationship to cheiro-oral and cheiro-oral-pedal syndrome. *J Neurol Sci* 1997;**153**:68–75.
6. Igarashi O, Iguchi H, Ogura N, Ichikawa Y, Kiyozuka T, Kawabe K, *et al*. Cheiro-oral-pedal syndrome due to brainstem hemorrhage. *Clin Neurol Neurosurg* 2016;**108**:507–10.
7. Horne MA, Flemming KD, Su IC, Stapf C, Jeon JP, Li D, *et al*. Clinical course of untreated cerebral cavernous malformations: a meta-analysis of individual patient data. *Lancet Neurol* 2016;**15**:166–73. doi: 10.1016/S1474-4422(15)00303-8.
8. Zyck S, Gould GC. *Cavernous Venous Malformation*. Treasure Island: StatPearls Publishing, 2020. https://www.ncbi.nlm.nih.gov/books/NBK526009/ (8 June 2020, date last accessed).
9. Kearns KN, Chen CJ, Tvrdik P, Park MS, Kalani MYS. Outcomes of surgery for brainstem cavernous malformations: a systematic review. *Stroke* 2019;**50**:2964–6. doi: 10.1161/STROKEAHA.119.026120.