JVIN | Journal of Vascular and Interventional Neurology

OFFICIAL JOURNAL OF ZEENAT QURESHI STROKE INSTITUTE

Segmental Arterial Dissection with Spinal Cord Ischemia in Surfer's Myelopathy

Alejandro M. Brunser, MD[1,2,*], Sofia González MD[1], Felipe Vial MD[1], Florencia Alamos[3], Marcela Valenzuela[1,2], Paulo Zúñiga MD[4], Pablo Lavados MD, PhD[2].

[1] General Emergency Department, Clínica Alemana de Santiago, Faculty of Medicine, Clínica Alemana, Universidad del Desarrollo, Santiago, Chile.

[2] Vascular Neurology Unit, Neurology Service, Department of Neurology and Psychiatry, Clínica Alemana de Santiago. Facultad de Medicina, Clínica Alemana Universidad del Desarrollo, Santiago, Chile.

[3] Programa Doctorado Neurociencias, Universidad Católica de Chile,Santiago, Chile.

[4] Department of Interventional Radiology Clínica Alemana, Santiago, Chile.

Abstract

Background— The etiology of surfers' myelopathy is not well understood. We report upon two patients who underwent acute spinal vascular angiographic imaging.

Case Description— A 20-year-old man and 32-year-old man presented with paraplegia or paraparesis after surfboard maneuvers. Segmental artery occlusion with pencil-shaped termination, suggestive of arterial dissection, was identified in both patients on spinal angiograms performed within 96 hours of symptom onset.

Conclusions— Our report identifies segmental arterial dissection with spinal cord ischemia as the underlying process for surfer's myelopathy.

Keywords— Myelopathy, paraparesis, surfing, spinal ischemia, angiography.

INTRODUCTION

Surfers' myelopathy was initially described by Thompson et al (1) in 2004 and since then several single case reports have been published, with more than 64 cases reported in the literature. (2-4) A recent systematic review focused on a possible vascular etiology, emphasizing on the lack of angiographic studies performed during the acute phase (5). We report upon two patients who underwent acute spinal vascular angiographic imaging.

CASE DESCRIPTION

We report two patients with surfer's myelopathy evaluated at Clínica Alemana. Both patients provided written informed consent for the publication of information and images.

Patient 1

A 20 year-old man, without any previous medical history, presented with sudden onset lower back pain followed by weakness in the lower extremities while he was standing on his surf board during his first surfing lesson. He arrived at a local hospital with paraplegia and intravenous steroids were administered. The patient was subsequently transferred to our center. On admission his vital signs were stable and he was awake without any cranial nerve deficits. The upper extremities were normal. He had a hypotonic and areflexic paraplegia accompanied by a Lumbar 1 bilateral sensory level involving multimodal sensory loss. Spinal magnetic resonance imaging showed an ischemic medullary lesion extending from the 7 thoracic spine level to the conus medullaris (Figure 1 A, B). Cerebrospinal fluid examination did not demonstrate any abnormalities. Polymerase chain reaction test for varicella zoster and herpes zoster virus were negative. Antibodies against aquaporin 4 channels, anti-nuclear and anticardiolipin were absent and screening for human immunodeficiency virus (HIV) and syphilis were negative in serum. A spinal angiography was performed on the 4th day demonstrating an occlusion at the Lumbar 2 left segmental artery ending in a 'pencil-like' termination suggestive of an arterial dissection. (Figure 1 C and D). An acute spinal ischemia secondary to surfer's myelopathy was diagnosed. The patient was managed

Vol.12, No. 2, pp. 18-20, Published November, 2021.

***Corresponding Author:** Alejandro M. Brunser, MD, Emergency Department of Clínica Alemana de Santiago, Facultad de Medicina Clínica Alemana, Universidad del Desarrollo, Santiago, Chile. Av. Manquehue Norte 1410, 10th floor. Vitacura 7630000. Santiago, Chile.

Tel: 56-2-2101061. Fax: 56-2-2101060. E-mail: abrunser@alemana.cl, abrunser2017@gmail.com.

with IV fluids, aspirin and rehabilitation. He was discharged with persistent paraplegia.

Patient 2

A 32 year old man, without any previous medical history, performed a dorso-lumbar hyperextension to stand on his surfboard during his first surfing lesson. He complained of lower back pain, followed by weakness of his legs and was brought to the emergency department. On admission his vital signs were stable and he was awake without any cranial nerve deficits. The upper extremities were normal. A flaccid paraparesis with a thoracic 12 sensory level was identified. A spinal magnetic resonance imaging showed a linear extensive hyperintensity suggestive of ischemic lesion in the anterior aspect of the spinal cord, from thoracic level 8 to the conus medullaris (see Figure 2, A and B). Antibodies against aquaporin 4 channels, anticardiolipin and anti-nuclear were absent and screening for human immunodeficiency virus (HIV) and syphilis were negative in serum A spinal angiography was performed within 72 hours of symptom onset. An abrupt pencil-like shape termination of the lumbar 2 right segmental artery was identified (see Figure 2, C and D) suggestive of an arterial dissection. The patient was managed with IV fluids, aspirin and rehabilitation, and was asymptomatic after 3 months.

DISCUSSION

Although the etiology of surfers' myelopathy is unknown, vascular spasms, compressions and/or thrombosis of artery of Adamkiewicz or one of the segmental arteries are implicated. The vascular compromise is presumed to be caused by prolonged periods of lying prone on the surfboard (5,6). Fibrocartilaginous embolisms have also been suspected for spinal ischemic strokes related to other physical activities (7). A systematic review of 64 cases of surfers' myelopathy identified an ischemic injury to the spinal cord as the most likely cause (5) although conclusive evidence was not available due to paucity of angiographic studies. In this systematic review, there was only one patient who underwent a spinal angiogram 4.5 months after the event. The right thoracic 12 radicular artery could not be seen on angiography although the distinction between acute occlusion or congenital absence could not be made. (5) In our report, segmental artery occlusion with pencil-shaped endings, suggestive of arterial dissection, was identified in both patients on spinal angiograms performed within 96 hours of symptom onset. (8) The arterial dissection could be caused by rapid change from prone to upright position with hip hyperextension on one side and flexion on the other side.

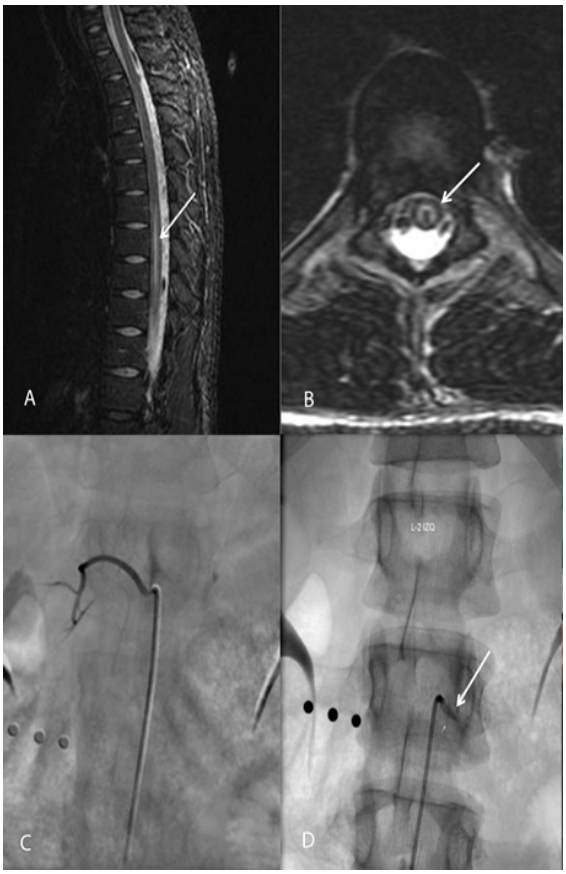

FIGURE 1: (A) and (B) Spinal magnetic resonance imaging. (A) Sagital Short-TI Inversion Recovery (STIR) (B) Axial T2 weighted image show linear hyperintensity within central thoracic spinal cord. Increased hyperintensity within central gray matter with sparing of spinal cord periphery is suggestive of acute ischemic lesion. (C) and (D) Angiographic study (C) Normal lumbar 1 right segmental artery (D) Lumbar 2 left segmental artery with proximal obliteration suggestive of steno-occlusive dissection.

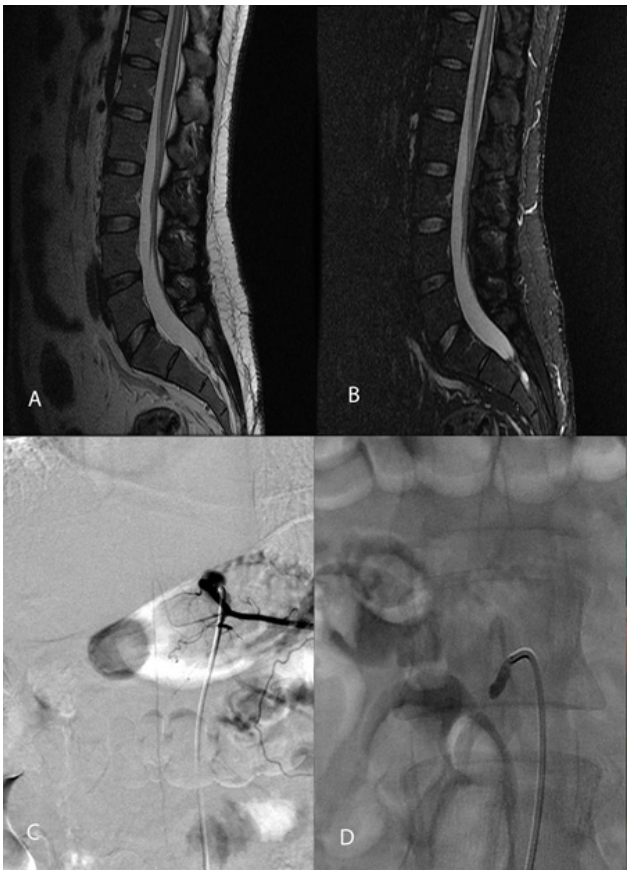

FIGURE 2: (A) and (B) Spinal magnetic resonance imaging (A) Sagittal T2 weighted image and (B) Sagittal Short-TI Inversion Recovery (STIR) show linear hyperintensity within central thoracic cord Increased hyperintensity within central gray matter with sparing of spinal cord periphery is suggestive of acute ischemic lesion. (C) and (D) Angiographic study. (C) Normal left artery of Adamkiewicz (D) Lumbar 2 right segmental artery with proximal obliteration suggestive of steno-occlusive dissection.

CONCLUSION

Our report identifies segmental arterial dissection with spinal cord ischemia as the underlying process for surfer's myelopathy. We recommend spinal angiography should be done in all patients within 72 hours of symptom onset.

FINANCIAL SPONSORSHIP

None.

DISCLOSURE

Potential financial interest are:

Alejandro M. Brunser: reports research grant from Clínica Alemana.

Sofia González: reports no conflicts of interest.

Felipe Vial: reports no conflicts of interest.

Florencia Alamos: reports no conflicts of interest.

Marcela Valenzuela: reports no conflicts of interest.

Paulo Zúñiga: reports no conflicts of interest.

Pablo Lavados: reports research grants from The George Institute and Clínica Alemana de Santiago for ENCHANTED, HEADPOST and RECCA studies; personal fees from AstraZeneca and Bayer as SOCRATES and ESUS NAVIGATE trials national leader and a Chilean Government research grant for the ÑANDU project outside the submitted work.

REFERENCES

1. Thompson TP, Pearce J, Chang G, et al. Surfer's myelopathy. *Spine* (Phila Pa 1976) 2004;29(16):E353-356.
2. Kelly M, Wright K. A case of surfer´s myelopathy. *Am J Clin Med*. 2010; 7:74-75.
3. Chung HY, Sun SF, Wang JL, et al. Non-traumatic anterior spinal cord infarction in a novice surfer: a case report. *J Neurol Sci* 2011;302(1–2):118–20.
4. Karabegovic A, Strachan-Jackman S, Carr D. Surfer's myelopathy: case report and review. *CJEM* 2011;13(5):357–60.
5. Freedman BA, Malone DG, Rasmussen PA, et al. Surfer's Myelopathy: A Rare Form of Spinal Cord Infarction in Novice Surfers: A Systematic Review. *Neurosurgery* 2016;78(5):602–11.
6. Spengos K, Tsivgoulis G, Toulas P, et al. Spinal cord stroke in a ballet dancer. *J Neurol Sci* 2006;244(1–2):159–61.
7. Nakamoto BK, Siu AM, Hashiba KA, et al. Surfer's myelopathy: a radiologic study of 23 cases. *AJNR Am J Neuroradiol* 2013;34(12): 2393-8.
8. Schievink WI. Spontaneous dissection of the carotid and vertebral arteries. *N Engl J Med* 2001;344(12):898–906.