12. Nylen CO. Robert Bárány. Arch Otolaryngol 1965;82:316–319.
13. Diamant H. The Nobel Prize award to Robert Bárány: a controversial decision? Acta Otolaryngol (Stockh) 1984; 406(suppl):1–4.
14. Hirschmüller A. The life and work of Josef Breuer: physiology and psychoanalysis [translation of “Physiologie und Psycho-

- analyse in Leben und Werk Josef Breuers.” Bern: Verlag Hans Huber, 1978]. New York: New York University Press, 1989.
15. Holmgren G. Robert Bárány. 1876–1936. Ann Otol Rhinol Laryngol 1936;45:593–595.
16. Majer EH, S Kopec M. History of oto-rhino-laryngology in Austria. An illustrated document. Vienna: Verlag Christian Brandstätter, 1986.

Neuro Images

Figure. Contrast arteriogram of the left internal carotid artery (ICA) (lateral view) shows a rounded proximal stump with flow in a spiral configuration around the circumference of the vessel but without filling of the true lumen of the ICA. The petrous segment fills via anterograde flow from the spiral vessels. (A) Early-phase and (B) late-phase angiography are shown.

Internal carotid artery “spring sign”

S.E. Kasner, MD, D.S. Liebeskind, MD, B.L. Cucchiara, MD, M.L. McGarvey, MD, J.A. Detre, MD, G. Sinson, MD, L.J. Bagley, MD, R.W. Hurst, MD, Philadelphia, PA

A 62-year-old woman had a minor left hemispheric ischemic stroke due to atherosclerotic complete occlusion of the left internal carotid artery (ICA), shown by ultrasound and MR angiography (MRA). She was treated with warfarin for several months, followed by antiplatelet therapy. MRA obtained 1 year later revealed that the ICA had partially recanalized but was severely stenotic. Carotid arteriography revealed flow in a spiral circumferential configuration in the wall of the proximal ICA without luminal filling (figure). The petrous segment was filled by anterograde flow through these spiral vessels rather than collaterals from the external carotid artery or the circle of Willis. The

patient continued with medical therapy without further events.

Atherosclerosis, dissection, or fibromuscular dysplasia may lead to severe stenosis of the ICA. On carotid arteriogram, a long, very narrow segment with a wisp of contrast in the true lumen is often referred to as “string sign.”¹ After complete occlusion of the ICA, recanalization is rare, but dilatation of the vasa vasorum may occur to such a degree that the distal lumen of the vessel may be reconstituted.² The pattern of filling of the vasa vasorum is reminiscent of a coil or spring, and thus we propose the term “spring sign” for this unusual phenomenon.

1. Ojemann RG, Fisher CM, Rich JC. Spontaneous dissecting aneurysm of the internal carotid artery. Stroke 1972;3:434–440.
2. Kemeny V, Droste DW, Nabavi DG, Shulte-Altdorneburg G, Schuierer G, Ringelstein B. Collateralization of an occluded internal carotid artery via a vas vasorum. Stroke 1998;29:521–523.

Neurology[®]

Internal carotid artery "spring sign"

S. E. Kasner, D. S. Liebeskind, B. L. Cucchiara, et al.

Neurology 2002;58;1099

DOI 10.1212/WNL.58.7.1099

This information is current as of April 9, 2002

Updated Information & Services	including high resolution figures, can be found at: http://n.neurology.org/content/58/7/1099.full
References	This article cites 2 articles, 2 of which you can access for free at: http://n.neurology.org/content/58/7/1099.full#ref-list-1
Citations	This article has been cited by 2 HighWire-hosted articles: http://n.neurology.org/content/58/7/1099.full##otherarticles
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): All Cerebrovascular disease/Stroke http://n.neurology.org/cgi/collection/all_cerebrovascular_disease_stroke
	MRI http://n.neurology.org/cgi/collection/mri
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.neurology.org/about/about_the_journal#permissions
Reprints	Information about ordering reprints can be found online: http://n.neurology.org/subscribers/advertise

Neurology® is the official journal of the American Academy of Neurology. Published continuously since 1951, it is now a weekly with 48 issues per year. Copyright . All rights reserved. Print ISSN: 0028-3878. Online ISSN: 1526-632X.