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### **Abdominal Pain and Vomiting due to Vertebral Artery Dissection: A Case Report of Stroke Chameleon.**

*Autori / Authors:* Sara Giannoni, Mariella Baldini, Maria Letizia Bartolozzi, Elisabetta Bertini, Ilaria Di Donato, Serena Colon, Elisa Grifoni, Elisa Madonia, Ira Signorini, Massimo Armellani, Andrea Pierfederico Sampieri, Luca Masotti, Leonello Guidi.

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*Contatto autori / Corresponding author:* Sara Giannoni,

sara3.giannoni@uslcentro.toscana.it



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**Radiologia, medicina nucleare, radioterapia, fisica medica / Radiology, nuclear medicine, radiotherapy, medical physics**

1

*Variazione della percezione del dolore nelle donne sottoposte a screening mammografico in base alla conformazione del seno.*

Deborah Esposito, Carmen Ludeno, Simona Marinelli, Anna Bertoldi, Valeria Selvestrel, Marianna Giannattasio, Lauretta Rizzari, Vincenzo Marra, Luisella Milanesio, Alfonso Frigerio, Andrea Luparia, Adriana Aiello, Livia Giordano, Emanuela Bovo, Elisa Camussi, Franca Artuso.

14

*Changes in pain perception in women undergoing Breast Screening Mammograms: a Study based on Breast structure.*

Deborah Esposito, Carmen Ludeno, Simona Marinelli, Anna Bertoldi, Valeria Selvestrel, Marianna Giannattasio, Lauretta Rizzari, Vincenzo Marra, Luisella Milanesio, Alfonso Frigerio, Andrea Luparia, Adriana Aiello, Livia Giordano, Emanuela Bovo, Elisa Camussi, Franca Artuso.

26

*Analisi dei rischi clinici in radiologia domiciliare attraverso il metodo FMEA.*  
*Analysis of Clinical Risks in Home-Based Radiology Using the FMEA Method.*

Claudia Pinton, Riccardo Garavello.

**Neuroscienze / Neuroscience**

56

*Dolore addominale e vomito per dissecazione dell'arteria vertebrale: un case report di stroke chameleon.*

Sara Giannoni, Mariella Baldini, Maria Letizia Bartolozzi, Elisabetta Bertini, Ilaria Di Donato, Serena Colon, Elisa Grifoni, Elisa Madonia, Ira Signorini, Massimo Armellani, Andrea Pierfederico Sampieri, Luca Masotti, Leonello Guidi.

64

*Abdominal Pain and Vomiting due to Vertebral Artery Dissection: A Case Report of Stroke Chameleon.*

Sara Giannoni, Mariella Baldini, Maria Letizia Bartolozzi, Elisabetta Bertini, Ilaria Di Donato, Serena Colon, Elisa Grifoni, Elisa Madonia, Ira Signorini, Massimo Armellani, Andrea Pierfederico Sampieri, Luca Masotti, Leonello Guidi.

72

*Aspetti genetici e biomarcatori nella demenza frontotemporale: stato dell'arte e prospettive future.*

*Genetic aspects and biomarkers in frontotemporal dementia: state of the art and future prospects.*

Daniele Pendenza, Enrico Pendenza.

Scienze ostetriche e ginecologiche / Obstetric and gynecological sciences

109

*Esiti materni e neonatali del parto in acqua e fuori dall'acqua nei travagli a basso rischio ostetrico: studio osservazionale retrospettivo presso l'Azienda USL di Piacenza.*

Elisa Piccolo, Giacomo Biasucci, Mariasole Magistrali, Belinda Benenati, Daniela Russo, Marina Paola Mercati, Sonia Tesoriati, Marina Cicalla, Simona Illari, Cristiana Pavesi, Maurizio Beretta, Marina Bolzoni.

122

*Maternal and neonatal outcomes of in-water and out-of-water births in low-obstetric-risk labour: a retrospective observational study at Piacenza hospital.*

Elisa Piccolo, Giacomo Biasucci, Mariasole Magistrali, Belinda Benenati, Daniela Russo, Marina Paola Mercati, Sonia Tesoriati, Marina Cicalla, Simona Illari, Cristiana Pavesi, Maurizio Beretta, Marina Bolzoni.

Audiologia e Scienze Tecniche Audiometriche e Audioprotesiche / Audiology and Audiometric Hearing Engineering Sciences

135

*Indagine sulle metodiche di screening uditivo neonatale implementate sul territorio nazionale italiano.*

*Survey on the methods of neonatal hearing screening implemented in Italy.*

Federica Baldin, Giulia Rossato.

Legislazione e scienze giuridiche sanitarie / Health legislation and legal sciences

|     |                                                                                                                                                                                                                                                                                                                                                                                                                |                              |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 174 | <p><i>La qualificazione giuridica del tempo in regime di reperibilità passiva nel comparto sanitario: analisi delle sentenze europee e nazionali, implicazioni normative e controversie applicative.</i></p> <p><i>The Legal Qualification of Time during On-Call Regime in the Healthcare Sector: Analysis of European and National Case Law, Regulatory Implications, and Application Controversies.</i></p> | Mattia La Rovere Petrongolo. |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|

Scienze sanitarie della prevenzione / Prevention health sciences

|     |                                                                                                                                                                                                  |                                  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 200 | <p><i>Sanzioni e prevenzione sono un binomio vincente per la sicurezza sul lavoro?</i></p> <p><i>Are sanctions and preventive measures an effective strategy to ensure workplace safety?</i></p> | Federica Ianieri, Laura Magnini. |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|

Scienze della Nutrizione e Dietetica / Nutrition and dietetic sciences

|     |                                                                                                                                                                                                                                                                                                    |                                                       |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| 220 | <p><i>Indagine sulle conoscenze dei professionisti della nutrizione e professionisti sanitari sul Counseling e Counseling Nutrizionale.</i></p> <p><i>Survey on Counseling and Nutritional Counseling among nutrition professionals in particular and healthcare professionals in general.</i></p> | Beatrice Pezzica, Emanuela Oliveri, Fabio Scaramelli. |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|

Scienze fisiatriche, fisioterapiche e riabilitative / Physical medicine, physiotherapy and rehabilitation

|     |                                                                                                                                                                            |                     |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 242 | <p><i>Riabilitazione Precoce in Pazienti con Frattura di Omero Proximale: Confronto dei Risultati Funzionali in Trattamenti Chirurgici e Non Chirurgici.</i></p>           | Maria Venera Menzo. |
| 248 | <p><i>Early Rehabilitation in Patients with Proximal Humeral Fracture: A Comparative Analysis of Functional Outcomes Between Surgical and Conservative Treatments.</i></p> | Maria Venera Menzo. |

## Abdominal Pain and Vomiting due to Vertebral Artery Dissection: A Case Report of Stroke Chameleon.

Sara Giannoni<sup>1</sup>, Mariella Baldini<sup>1</sup>, Maria Letizia Bartolozzi<sup>1</sup>, Elisabetta Bertini<sup>1</sup>, Ilaria Di Donato<sup>1</sup>, Serena Colon<sup>1</sup>, Elisa Grifoni<sup>2</sup>, Elisa Madonia<sup>2</sup>, Ira Signorini<sup>2</sup>, Massimo Armellani<sup>3</sup>, Andrea Pierfederico Sampieri<sup>3</sup>, Luca Masotti<sup>2</sup>, Leonello Guidi<sup>1</sup>.

<sup>1</sup> Neurology Department, San Giuseppe Hospital, Empoli, Italy

<sup>2</sup> Stroke Unit- Internal Medicine II, San Giuseppe Hospital, Empoli, Italy

<sup>3</sup> Radiology Unit, San Giuseppe Hospital, Empoli, Italy

Corresponding author: Sara Giannoni - [sara3.giannoni@uslcentro.toscana.it](mailto:sara3.giannoni@uslcentro.toscana.it)

Orcid: <https://orcid.org/0000-0003-0538-0412>

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## ABSTRACT

### INTRODUCTION

The causes of nausea, vomiting, and abdominal pain can be multiple, sometimes including neurological conditions, especially if posterior cranial fossa structures are involved.

### CASE DESCRIPTION

A 46-year-old man accesses the Emergency Department for sudden onset of algid sweating, headache, dizziness, vomiting, and severe abdominal pain. The diagnostic workup was negative for gastroenterological issues, and the patient was detained for observation. The following day, the patient developed right-sided Horner's syndrome.

### MATERIALS AND METHODS

Echo-color Doppler and neuro-radiological imaging of the cerebro-afferent vessels was performed with finding of right vertebral artery dissection. Brain magnetic resonance imaging (MRI) showed diffusion-restricted lesions in the right cerebellar hemisphere and dorsolateral medulla, indicative of ischemic stroke.

### RESULTS

The patient progressively improved, and the neurological examination was normal at discharge. A six-month follow-up MR angiography of intra and extracranial vessels was performed, with persistent right vertebral artery occlusion, in the absence of wall hematoma or pseudoaneurysm.

### DISCUSSION

Vertebral artery dissection is estimated to be the cause of approximately 2% of all ischemic strokes, with estimated annual incidence of 2.6-2.9 per 100,000 individuals. The events occur mostly in young individuals who typically present with non-specific symptoms such as dizziness, headache, and cervicalgia; therefore, onset associated with intense abdominal pain is extremely rare.

### CONCLUSION

Recognizing that gastrointestinal symptoms may be, rarely, attributable to stroke is useful in avoid ineffective medical management and directing the correct diagnostic and therapeutic process.

**Key Words:** stroke, vertebral artery dissection, brainstem.

## INTRODUCTION

Nausea, incoercible vomiting, and abdominal pain are commonly encountered problems in any general medicine or gastroenterology service. Several causes can be listed, from infections to chronic medical conditions [1]. Rarely, neurological causes can also induce this clinical picture, especially when the brainstem is involved [2], such as in stroke due to anterior spinal artery occlusion or small vascular branches of the vertebral artery [3]. Understanding that gastrointestinal symptoms may be possible neurological manifestations can significantly change the diagnostic and therapeutic approach, especially in emergency cases.

The clinical case presented configures a stroke chameleon, that is, a situation in which an ischemic stroke manifests with atypical symptoms that hinder initial diagnostic framing. In contrast, stroke mimic is a disorder initially framed as an ischemic stroke but actually dependent on other causes, such as epilepsy.

## CASE REPORT

A 46-year-old man presented to the Emergency Department with sudden onset of algid sweating and subsequent onset of headache, dizziness, vomiting, and severe abdominal pain. Past medical history was essentially negative. Blood tests showed no significant pathological changes suggestive of inflammation. Abdominal ultrasound (US) showed no abnormalities of the abdominal viscera. The patient also had a non-contrast cranial CT exam, which was negative for acute lesions, and was therefore admitted for management of dehydration, secondary to suspected gastroenteritis. Nausea, vomiting, and headache gradually improved with the use of symptomatic drugs, but the following day the patient presented with right-sided Bernard Horner syndrome.

## MATERIALS AND METHODS

Considering that among the main causes of Bernard-Horner syndrome are dissection of the cerebro-afferent vessels, an Echo-color Doppler ultrasound of the supra-aortic trunks was then performed (Figure 1 A, B), with evidence of dissection of the right vertebral artery throughout, also confirmed by the following angio-CT of intra and extracranial vessels (Figure 2).

All images shown were acquired at the hospital San Giuseppe in Empoli, via the ultrasound scanner ( Esaote, Linear Probe Frequency Range: 5 - 10 MHz), CT scanner (Siemens Healthcare), and MRI scanner (Philips-1.5T). The protection of patient privacy was considered in accordance with the law EU2016/679, and transposition in Italy D. Lgs.101/2018.

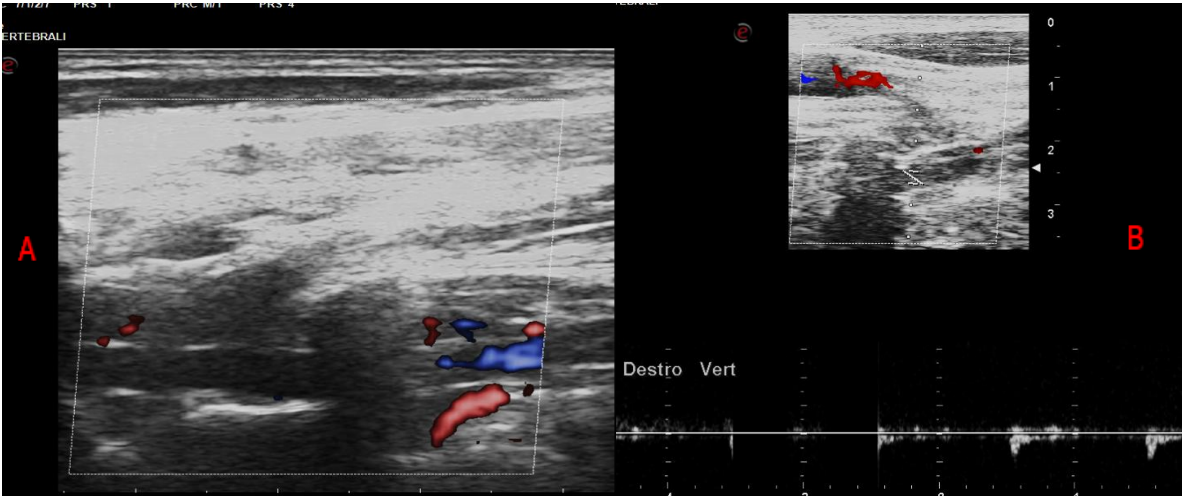


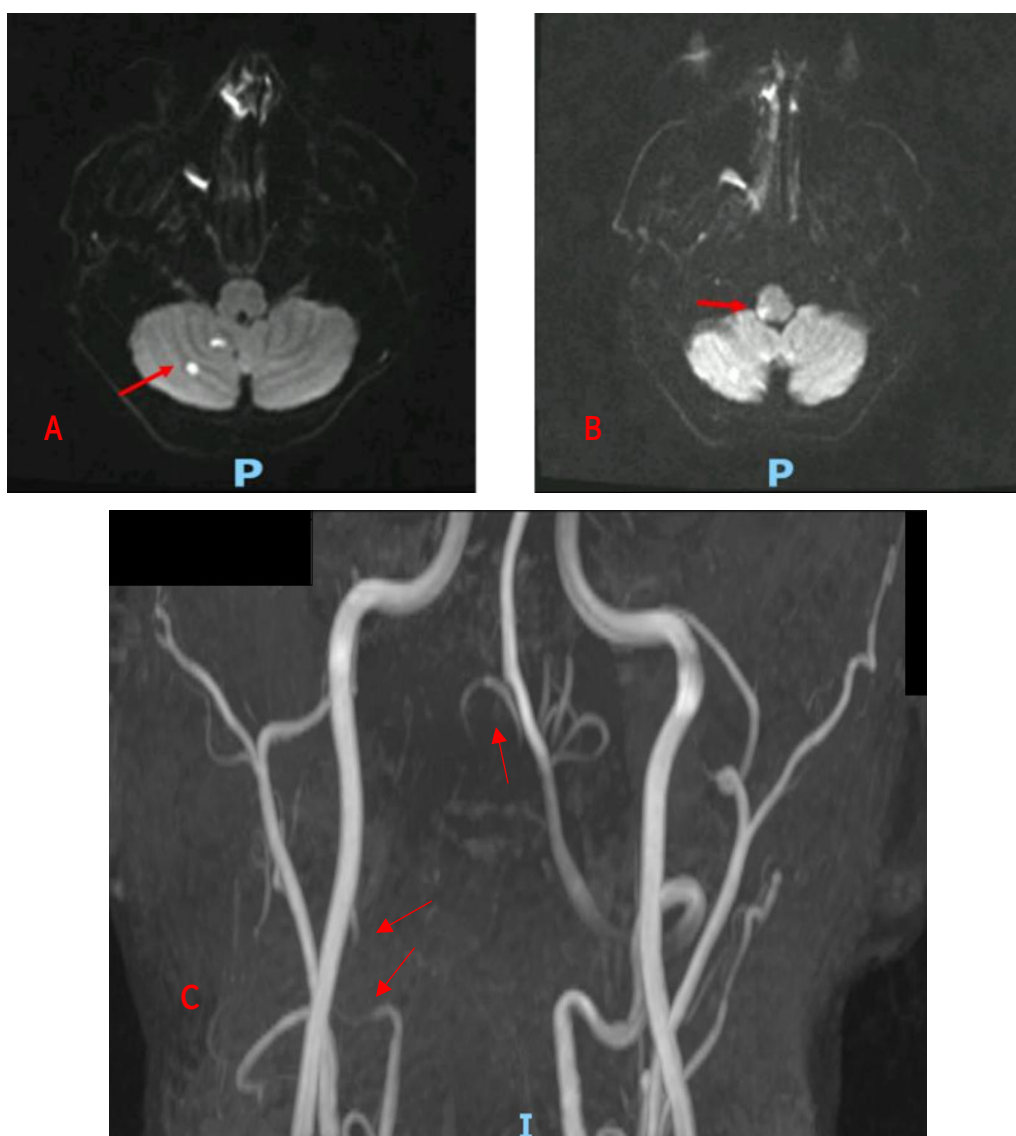
Figure 1: (A) Ultrasound examination of right vertebral artery with evidence of dissection; (B) with systolic spikes



Figure 2: angio-CT of intracranial vessels showing occlusion of the right vertebral artery (red arrow), visualized in the extra to intracranial passage

Brain MRI revealed small, diffusion-restricted findings, indicative for subacute ischemic lesions, in the right cerebellar hemisphere and dorsolateral medulla (Figure 3 A, B), including visceral sensory afferents and the nucleus of the solitary tract, clinically compatible not only with right-sided Horner syndrome, but also with the abdominal pain reported by the patient.

The examination was completed with angiographic study and post processing construction of maximum intensity projection (MIP) and showed occlusion of the right cerebral artery (Figure 3C).



*Figure 3: (A, B) encephalon and brainstem MRIs with diffusion weighted imaging (DWI) and FLAIR sequence showing multiple ischemic lesions at the level of the right cerebellar hemisphere and in the dorsolateral region of the bulb (site of visceral afferent sensory fibers and the nucleus of the solitary tract), red arrows; (C) angio-MRI of intracranial vessels with evidence of right vertebral artery occlusion (red arrow)*

An angio-CT abdominal vessels was also performed, which excluded dissections in the splanchnic district.

The patient started treatment with acetylsalicylic acid 300 mg/day and anti-thrombotic prophylaxis with subcutaneous low molecular weight heparin, the latter maintained until the patient was properly mobilized.

Upon further investigation of the medical history, a condition of repeated cervical stress emerged, partly due to the work activity of carrying heavy leather on the shoulder and partly to recent olive tree pruning activity, with holding the neck in hyperextension for several hours.

The patient reported no family history of vascular wall diseases and had no dissections in any other vascular district of the body.

However, a comprehensive study of possible hypercoagulability causes including homocysteine, protein C, protein S, antithrombin III, Factor V Leiden, prothrombin, and anti-phospholipid antibodies testing, was performed, from which no pathological findings were found.

We did not consider it necessary to investigate the presence of patency of the foramen ovale.

## RESULTS

The patient improved clinically, and the neurological examination was normal at discharge.

A follow up MR angiography with contrast medium of intra and extracranial vessels was performed after six months, and it still showed occlusion of the right vertebral artery throughout its course, without wall hematoma or pseudoaneurysm.

## DISCUSSION

This clinical case is the only one so far described in the literature in which a patient with isolated vertebral artery dissection presented with abdominal pain in association with clear neurological complaints. Indeed, a similar case, presented by Sakamoto et al. [3], described a patient with altered consciousness and abdominal pain due to concomitant dissection of right vertebral artery and superior mesenteric artery, which our patient did not have.

Vertebral artery dissection is estimated to cause about 2% of all ischemic strokes, with an estimated annual incidence of 2.6-2.9 per 100,000 individuals [4]. The events occur more commonly in young subjects who typically present with non-specific symptoms, such as dizziness, headache, and cervicalgia.

Although the diagnostic hypothesis of vertebral artery dissection is more likely to be considered in patients with a clear history of cervical trauma/manipulations, or with a known connective

tissue disease, in some cases none of these risk factors is present. Indeed, a recent meta-analysis showed that almost 50% of cases occur in the absence of such risk factors [5].

The most recent clinical trials and meta-analyses regarding medical therapy for cervical arterial dissections do not depict significant differences in terms of risk-benefit and long-term outcomes between single platelet monoantiaggregation vs. warfarin anticoagulation [6,7]. For our patient, we chose to introduce antiplatelet therapy, in view of the extension of the dissection to the intracranial level, a feature that may increase the risk of bleeding.

Regarding neuroradiological follow-up, the range of anatomical resolution of dissections is very wide, from 46% to 90% of cases as far as reported in the scientific literature, with recanalization ranging from 33% to 50% [8].

Regarding long-term treatment with single antiplatelet therapy, no precise guidance on the duration of treatment is currently available. The ESO-Karolinska guidelines recommend continuing therapy for 6-12 months, taking into consideration the possibility of discontinuing treatment in patients who had complete resolution of the dissection and recurrence of symptom [9].

The risk of recurrence of dissection either in the same artery or in another arterial vessel is an infrequent event; a recent meta-analysis has quantified this risk as about 2% at one month after the first event, and about 7% at one year [10].

## CONCLUSIONS

Recognizing that nausea, vomiting, and abdominal pain can be attributable to a cerebral stroke, although it is a very rare event, is helpful in avoiding inaccurate and ineffective medical management in order to pursue the right diagnostic and therapeutic process [11].

Careful clinical evaluation and the use of a multidisciplinary diagnostic approach can make a difference in the management of the acute phase of stroke, particularly in cases of atypical presentations.

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