



# Cranial nerve palsy secondary to cerebrospinal fluid diversion



Guichen Li<sup>a</sup>, Xiaobo Zhu<sup>b</sup>, Yang Zhang<sup>b</sup>, Jinchuan Zhao<sup>b</sup>, Zhiguo Han<sup>c</sup>, Kun Hou<sup>b,\*</sup>

<sup>a</sup> Department of Neurology, The First Hospital of Jilin University, Changchun, Jilin, China

<sup>b</sup> Department of Neurosurgery, The First Hospital of Jilin University, Changchun, Jilin, China

<sup>c</sup> Department of Surgery, Changchun Orthopaedics Hospital, Changchun, Jilin, China

## ARTICLE INFO

### Article history:

Received 20 November 2015

Received in revised form 1 February 2016

Accepted 7 February 2016

Available online 9 February 2016

### Keywords:

Cerebrospinal fluid diversion

Cerebrospinal fluid hypovolemia

Cranial nerve palsy

External lumbar drainage

Lumbar puncture

Ventriculoperitoneal shunt

## ABSTRACT

**Objective:** Cranial nerve palsy (CNP) secondary to cerebrospinal fluid (CSF) diversion is less familiar to us as a result of its rarity in incidence and insidiousness in presentation. This study aims to further expound the pathophysiological mechanism, clinical presentation, diagnosis, management and prognosis of CNP. **Methods:** From June 2012 to February 2015, 5 of 347 consecutive patients with CNPs secondary to different CSF diversion procedures were treated at our institution. A systematic PubMed search of published studies written in English for patients developing CNPs after CSF diversion procedures from January 1950 to June 2015 was conducted.

**Results:** Overall, 29 studies and 5 patients of the current series totaling 53 CNPs met the inclusion criteria. CN II, III, IV, V, VI, VII and VIII were got involved in 2 (3.8%), 2 (3.8%), 5 (9.4%), 1 (1.9%), 44 (83.0%), 4 (7.5%) and 1 (1.9%) patients respectively. Thirty-eight patients (71.7%) developed CNPs following inadvertent lumbar puncture, 8 (15.1%) following lumbar drainage, and 7 (13.2%) following ventriculoperitoneal shunt. Forty-eight (90.6%) patients got resolved completely.

**Conclusions:** The proposed mechanism of CNP after CSF diversion procedure is CSF hypovolemia and subsequent downward displacement of the brain and traction and distortion of the vascular and peripheral neural structures. As a result of its distinct anatomic characteristics rather than long intracranial course, CN VI is most commonly affected. With early recognition and timely conservative management, most patients could get favorable recovery.

© 2016 Elsevier B.V. All rights reserved.

## 1. Introduction

Cerebrospinal fluid (CSF) diversions as lumbar puncture (LP), external lumbar drainage (ELD), external ventricular drainage (EVD), and CSF shunting are common procedures in daily neurosurgical practice. Complications secondary to CSF diversion procedures are diverse in presentation. Transtentorial herniation, intracranial hemorrhage, shunt malfunction and meningitis are relatively common and fatal complications [1–5]. But cranial nerve palsy (CNP) secondary to CSF diversion is less familiar to us as a result of its rarity in incidence and insidiousness in presentation [6]. In this study we would like to present 5 cases of CNPs after different CSF diversion procedures. To further expound this rare entity, we conducted an extensive review of the literature. The pathophysiological mechanism, clinical presentation, diagnosis, management and prognosis of this unique entity would be discussed in detail.

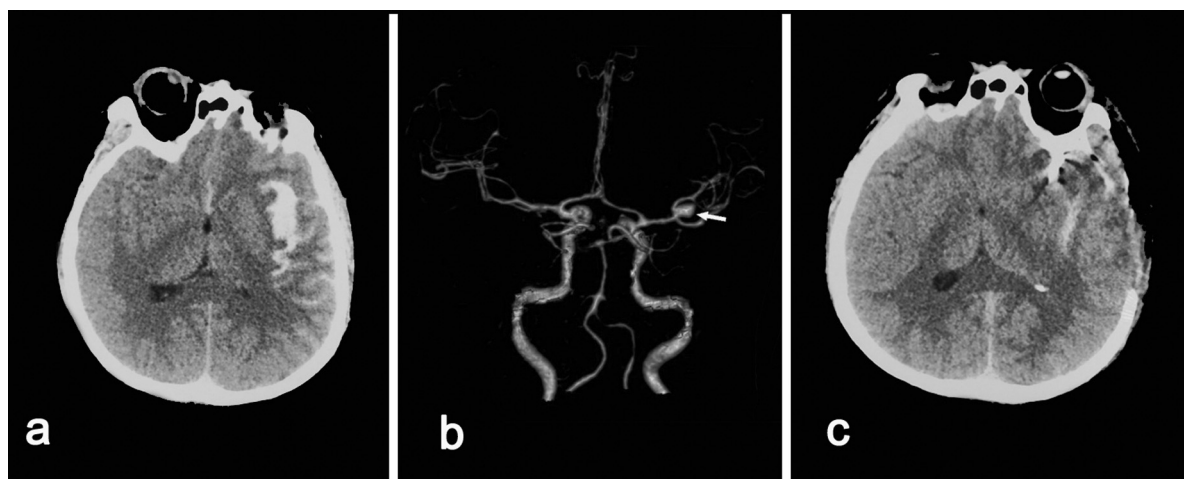
## 2. Material and methods

### 2.1. Definition of CNP secondary to CSF diversion

When CNP secondary to CSF diversion was considered, the following criteria should at least be met simultaneously.

- (1) One or more of the CSF diversion procedures such as LP, ELD, EVD, and CSF shunting was/were performed before the symptom onset of CNP. Because procedures as spinal anesthesia and myelography often involve CSF depletion, it was also considered one kind of CSF diversion in this study.
- (2) CNP occurred before the CSF diversion modality was removed or when it was still exerting effect.
- (3) No other definite causes responsible for the genesis of CNP were identified by the radiological, laboratory and clinical investigations.

\* Corresponding author at: Department of Neurosurgery, The First Hospital of Jilin University, 3302 Jilin Road, Changchun 130031, China. Fax: +86 043184808174.  
E-mail address: [hkyayz@yeah.net](mailto:hkyayz@yeah.net) (K. Hou).



**Fig. 1.** Preoperative head CT shows subarachnoid hemorrhage concentrated in the left sylvian fissure (a), further CTA reveals an aneurysm at the bifurcation of the left middle cerebral artery (b, arrow). Postoperative CT shows a tight ventricular system and midline shift to the right side (c).

## 2.2. Case series in our institution

A retrospective review of the medical records of the patients who had undergone all kinds of CSF diversion procedures in our institution from June 2012 to February 2015 was performed. Clinical data including primary disease and CSF diversion procedure, cranial nerve inflected, accompanying chronic disease as diabetes and hypertension, management, outcome, and follow-up of each patient were collected for data interpretation.

## 2.3. Literature search

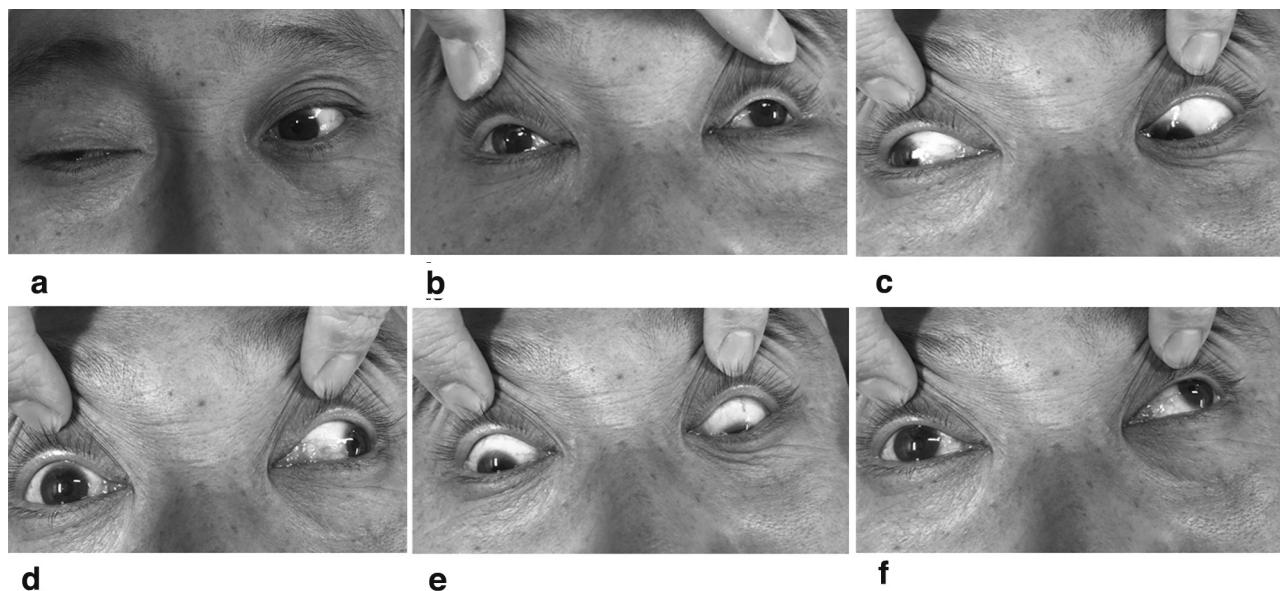
A systematic PubMed search of published studies written in English for patients developing CNPs after CSF diversion procedures from January 1950 to June 2015 was conducted. The following key words were used as searching conditions: “cranial nerve palsy,” “shunt,” “shunting,” “drainage,” “drain,” “hydrocephalus,” “lumbar puncture,” and “spinal anesthesia.” The references of all identified articles were also manually searched for additional studies. Because of the complexity in mechanism; CNPs secondary to CSF

diversions in patients with anomalies in the posterior fossa; e.g. Dandy–Walker syndrome and trapped fourth ventricle; endoscopic third ventriculostomy and shunt malfunction were excluded from this study.

## 3. Results

### 3.1. Current series

From June 2012 to February 2015, 347 consecutive patients had undergone all kinds of CSF diversion procedures in our institution. Among them 5 female patients (4 after external lumbar drainage, 1 after ventriculoperitoneal shunt) developed CNPs (Table 1). The primary diseases were intracranial aneurysms in 4 patients and obstructive hydrocephalus secondary to aneurysmal subarachnoid hemorrhage (SAH) in 1 patient. The inflected cranial nerves were cranial nerve III (1), VII (2), and VI (2). All the patients recovered completely in a time course from 1 h to 3 months after CNPs onset.



**Fig. 2.** Physical examination shows right ptosis (a) and motility limitation of the right eye when looking leftward (d), downward (e) and upward (f). No evident abnormality was noted when looking forward (b) and rightward (c).

Download English Version:

<https://daneshyari.com/en/article/3039632>

Download Persian Version:

<https://daneshyari.com/article/3039632>

[Daneshyari.com](https://daneshyari.com)